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Eramen Minerals Inc.
Nickeliferous Laterite Mining Project
Sta. Cruz and Candelaria, Zambales

Environmental Protection and Enhancement Program (EPEP) and Final Mine Rehabilitation and Decommissioning Plan (FMRDP)

Eramen Minerals, Inc.
3/F ALPAP 1 Building
No. 140 Leviste Street
Salcedo Village, Makati City

EXECUTIVE SUMMARY

The company, Eramen Minerals Incorporated (EMI for brevity), which is represented by Enrique C. Fernandez, President, is already in its initial stage of developing a nickel laterite mining operation located at Brgys. Lucapon north and south, Tubo-tubo north and south, Guisguis, Guinabon and Uacon, in the municipalities of Sta. Cruz and Candelaria, province of Zambales. On 19 April 2005, the project proponent entered into a Mineral Production Sharing Agreement (MPSA) No. 209-2005-111 with the Department of Environment and Natural Resources (represented by former Secretary Michael T. Defensor). The contract area covers a total area of Four Thousand Six Hundred Nineteen and point 6,869 hectares (4,619.6869).

The mining operation will be done using the standard contour mining method with a proposed annual production of about 600,000 – 1.5M WMT at 1.44 is to 1.0 waste to ore ratio. Initial stripping activities will be conducted at Block 5 (1,609.39 hectares) and Block 7 (2,240,042 hectares) with each block operating for a period of twelve (12) years. The partially mineable blocked of EMI encompasses an area of about 120.00 hectares. However, mining activities will vary upon confirmation of additional ore resource determined during exploration.

The estimated capital expenditure of the project is **PHP** 112,288,314.00 or **PhP** 112.28M which covers the labor costs, fuel, lubricants, spare parts, among others and administrative expenses at the Head Office. Out of the estimated total capital expenditure of the project of about **PHP 50.0M** will be earmarked for initial capital investment to initialize the project.

The mining method is dictated by the nature of the occurrence of laterite that contains the ore. Although the mining method falls under the open pit mining category, the actual mining method to be employed is appropriately termed "contour mining", where the laterite is extracted following the contour or topography of the area.

In traditional mining, the usual method is to open as large a mining area as possible and to defer mine rehabilitation until the ores are fully depleted. Consistent with its ethos on sound environmental management, EMI will employ a contour mining program simultaneous with progressive site rehabilitation.

EMI will develop manageable parcels of area for mining to which a progressive rehabilitation program follows immediately after the parcel is mined out, thus, limiting the effect of ground disturbance which will also reduce erosion and sedimentation. The immediate and proper restoration of vegetation will allow repopulation of wildlife aside from improved visual aesthetics.

After the issuance of the ECC and mining permit to EMI, construction of mining infrastructures will commence, i.e., assay laboratory, mechanical shop, training center, clinic, nursery and other relevant mining structures used during the operation phase of the project. Additional earthworks may be carried out, particularly those involving road widening and networks and construction of a pier jetty at Barangay Naulo or Barangay Uacon.

The proposed constructions of a pier jetty/causeway in both barangays will still an option of the company. Once the confirmation of the additional reserves in the area located at the southern part (Barangay Uacon, Candelaria) and at the northern part (Barangay Naulo, Sta. Cruz) will be established then the company will apply for another environmental compliance certificate and permit for the construction of the said structures. For the meantime, the company will be utilizing the Acoje pier through the Municipality of Sta. Cruz.

The projected annual production of EMI ranges between 600,000 – 1.5 million WMT of nickel silicate ores, this will vary based on the result of the exploration to delineate additional resource. The over-all waste to ore ratio is 1.44:1. Waste will be moved and delivered to overburden stockyards, dumpsites, for utilization as backfilling materials in future rehabilitation programs

Initial mining activities will be conducted at Block 5 and Block 7 with both blocks operated for a period of 12 years. However, mining activities, targets, and schedules will be adjusted upon the confirmation of additional ore resources delineated in the exploration.

The manpower requirement of the project during normal operation will consist of 73 Staff and 566 Rank and File/Contract Workers. Majority of the workforce will be sourced locally within the host or neighboring communities of Sta. Cruz.

Since every mining activity will require removal of soil and rock materials, changes to land form are unavoidable impacts. This will be most visible during extent of the project and will diminish when nearing the 12th year of the operation. It is anticipated that earth moving shall be a consequential part of the mining method, therefore appropriate environmental mitigating measures shall be implemented in conjunction with all the phases of the operation.

The company pledges to implement environmental protection measures mentioned in this EPEP as part of their environmental protection commitments.

To address the potential environmental impacts of this project, the proponent will allocate a total budget of **PhP 91,420,000.00 or PhP 91.42 M**, spread over 12 years. The Annual EPEP budget is **PHP 7.62M**. This amount exceeds the required statute of 3-5% of the direct mining costs. The Direct Mining Cost is estimated at **PHP 156.0M.**

Moreover, in compliance to Section 187 of DENR Administrative Order 96-40, EMI formulated a Final Mine Rehabilitation and Decommissioning Plan (FMRDP) for the Project. This document shall likewise form part and parcel of the company's Environmental Protection and Enhancement Program (EPEP).

The estimated aggregate area of mine pits is about 208.15 hectares. During the life of the project, a progressive rehabilitation measures shall be adopted using the best practice in mine restoration and land reclamation. The sequence of the progressive rehabilitation consist of land reclamation using the low grade laterite or waste materials stripped during the development phase, Re-contouring or leveling, slope stabilization by seeding the area with grass species or leguminous shrub species and finally, and planting of appropriate tree species that may be recommended by the Forest Management Sector from the DENR Provincial Office of Zambales.

In the planning and implementation of FMRDP, EMI shall adhere to (1) protect public health and safety, reduce or eliminate environmental damage, (2) achieve a productive use of the land or return to its near original condition or acceptable alternative use, and to (3) provide sustainability of social and economic benefits to affected communities.

To accomplish the objective of the FMRDP EMI will (1) consult with community leaders and the stakeholders in the closure planning, treat on the site of any existing or potentially hazardous materials, equipment and/or structures; (2) contain on site any existing or potentially hazardous substances, or conditions by collection and storage, encapsulation, burial, etc. (3) Continue the progressive rehabilitation and adoption of safety and environmental management measures in case of unplanned and sudden mine closure, and (4) Regularly evaluate of the closures plans as mine development progresses;

All the activities that will be implemented by EMI in the FMRDP process are in preparation for the final land use of the project site after closure.

Based on initial dialogue with community leaders and concerned agencies, the recommendations for the final landform or post land use of the project area are generally a tree plantation site inter cropped with fast growing plants with the purposes of immediately providing a source of livelihood for the local communities. An illustration of conceptual tree plantation program is shown in the attachment of this document.

Additionally, EMI shall adopt the final land use for the nickel mine site in accordance with the DENR/MGB reforestation program otherwise known as. "Mining Forest Program (MFP)"

A simplified methodology on risk assessment shall be adopted with the following steps:

- Analyze potential failure at the site
- Assess the release scenario;
- Evaluate the potential impacts resulting from the release;
- Evaluate the risk;
- Managed the risk to ensure they are minimized or acceptable.

Owing to the simplicity of the mining operation and considering that it will not process the ore and therefore will not produce mill tailings, there are no major risks associated with the project.

The implementation, maintenance and monitoring of the FMRDP will take ten (10) years. The approximate cost of implementation is **PHP 18.24M.**

ENVIRONMENTAL PROTECTION AND ENHANCEMENT PROGRAM

1.0 CORPORATE DATA

1.1 PROJECT NAME

NICKEL SILICATE AND ASSOCIATED METAL ORE OPEN MINING PROJECT

1.2 COMPANY NAME AND ADDRESS

ERAMEN MINERALS INC. (EMI)
3/F ALPAP 1 Building, No. 140 Leviste Street
Salcedo Village, Makati City

Tel No. (632) 817-1180; Telefax No. (632) 840-4549

1.3 CONTACT PERSON

ENRIQUE C. FERNANDEZ
President

2.0 PROJECT DESCRIPTION

2.1 PROJECT DETAILS

2.1.1 Project Location

The Project encompasses several barangays in the Municipalities of Sta. Cruz and Candelaria, Province of Zambales, namely, Lucapon North and South, Tubotubo North and South, Guinabon, Guisguis, and Uacon. Figure 2.1-1 shows the geographical location of the Philippines and the location of EMI project site. Two barangays are candidate areas for locating the Causeway – Barangay Naulo in Sta. Cruz and Barangay Uacon in Candelaria. The proposed constructions of a pier jetty/causeway in both barangays will still an option of the company. Once the confirmation of the additional reserves in the area located at the southern part (Barangay Uacon, Candelaria) and at the northern part (Barangay Naulo, Sta. Cruz) will be established then the company will apply for another environmental compliance certificate and permit for the construction of the said structures. For the meantime, the company will be utilizing the Acoje pier through the Municipality of Sta.

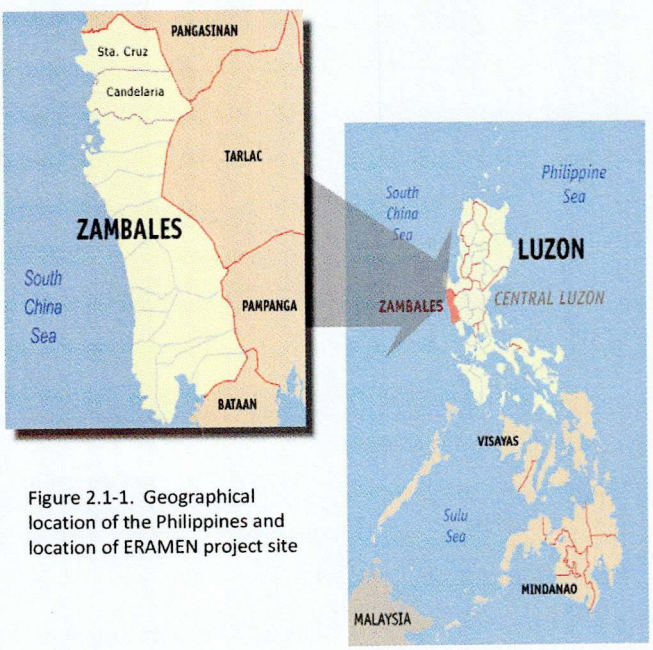

Figure 2.1-1. Geographical location of the Philippines and location of ERAMEN project site

Cruz. The MPSA claim as shown in Figure 2.1-2 consists of 9 blocks covering a total area of 4,619.6869 ha. Geographic coordinates of the blocked ore resources are detailed in Annex 1. Mining will be conducted in two (2) blocks, Blocks 5 and 7. The remaining seven (7) blocks will be further explored to identify potential ore resource for the project.

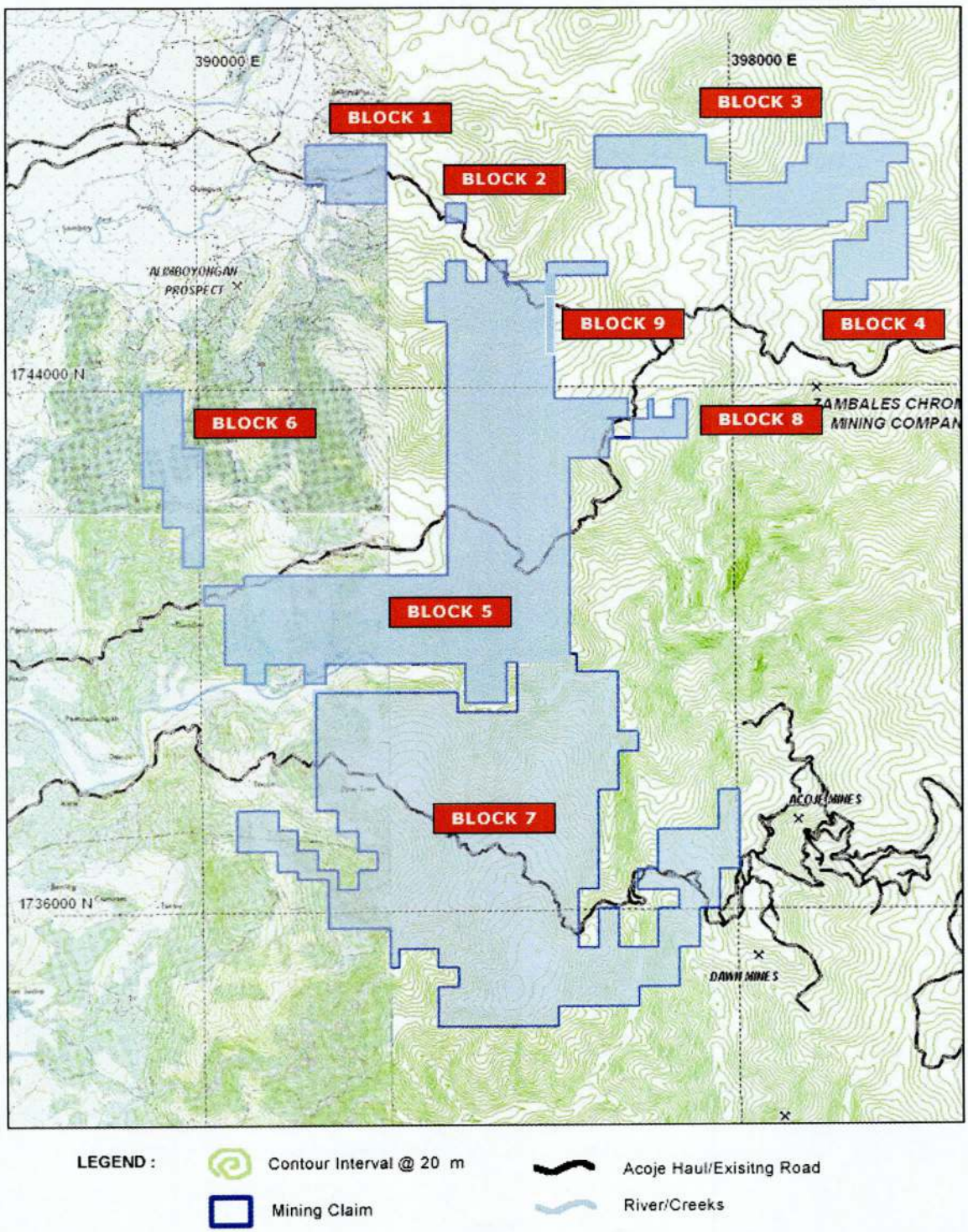

Figure 2.1-2. Delineated MPSA Boundaries of the EMI project site

2.1.2 Estimated Capital Expenditure

The estimated capital expenditure of the project is **PHP** 112,288,314.00 or PhP 112.28M which will take care of the labor costs, fuel, lubricants, spare parts, among others and administrative expenses at the Head Office. Below is the breakdown of the capital expenditure:

Table 2.1-1. Summary of Capital Expenditure (CAPEX)

Summary of CAPEX (PHP)	Year 0
Laboratory Equipment	6,600,000.00
Office Equipment	9,181,755.00
Land Clearing and Site Preparation	550,000.00
Service Vehicle	10,000,000.00
Office Furniture	10,000,000.00
Survey Equipment	600,000.00
Infrastructure (Civil Works)	11,000,000.00
Laboratory Building	2,500,000.00
Mobilization	660,000.00
Road Construction	13,200,000.00
Settling Ponds Construction	9,020,000.00
Environmental Management	499,866.00
Working Capital	37,476,693.00
ECC Acquisition	1,000,000.00
TOTAL (PHP)	**112,288,314.00**

Out of the estimated total capital expenditure of the project at **PhP 356.6M**/PHP 112,288,314.00 or PhP 112.28M, about PHP 50.00M will be earmarked for initial capital investment to mobilize the project. Details on Capital Investment are shown in Table 2.1-2.

Table 2.1-2. Breakdown of Initial Capital Investment

Particulars	Cost (PHP)
Buildings/Structures	35,929,275.00
Survey Equipment	600,000.00
Analytical Laboratory Equipment	6,324,000.00
Office Equipment and Fixtures	1,917,600.00
Environmental Monitoring Equipment	5,265,749.00
TOTAL	**50,036,624.00**

Total operating expenditure for the 12-year mine life is estimated at PHP 203.93M where the direct mining cost representing waste stripping, ore mining, processing (Drying and Ore Blending), and ship loading is PHP 156.0M. One percent (1%) of Direct Mining Cost computed at PHP 1.56M goes to the Social Development Management Program.

However, the SDMP budget projected in this program is a conservative estimate and figures will vary during actual operation. EMI may allocate a budget beyond what is mandated by the law for the SDMP. As far as social progress and development is concerned for the host communities, the 1% of direct mining costs provides only a reference of the minimum financial package for the communities in the form of livelihood assistance, health and education programs, and priority community infrastructures.

Table 2.1-3. Summary of Operating Costs

Particulars	Cost (PHP)
Direct Mining Costs	156,000,000.00
Social Development Management (1% of Direct Mining Costs)	1,560,000.00
Road Maintenance	4,933,168.00
Environmental Management	8,546,080.00
Laboratory	1,705,610.00
Administration	19,559,328.00
Depreciation	11,631,518.00
TOTAL	**203,935,704.00**

2.1.3 Minerals (type to be mined)

Generally, the type of mineral to be mined is nickeliferous laterite deposits with 1.70% nickel and 0.039% cobalt. In addition to the nickel and cobalt, there is also potential for chromite as well as for platinum group of metals within the MPSA area of EMI.

2.1.4 Mining Method

The mining method is dictated by the nature of the occurrence of laterite that contains the ore. Although the mining method falls under the open pit mining category, the actual mining method to be employed is appropriately termed "contour mining", where the laterite is extracted following the contour or topography of the area.

In traditional mining, the usual method is to open as large a mining area as possible and to defer mine rehabilitation until the ores are fully depleted. Consistent with its ethos on sound environmental management, EMI will employ a contour mining program simultaneous with progressive site rehabilitation. The working/mining area at any one pit during the active operation would be 6.25 hectares. The maximum depth of the mine, until it will reach the mineable ore. The mining cost/ton is about PhP 226/ton.

EMI will develop manageable parcels of area for mining to which a progressive rehabilitation program follows immediately after the parcel is mined out, thus, limiting the effect of ground disturbance which will also reduce erosion and sedimentation. The immediate and proper restoration of vegetation will allow repopulation of wildlife aside from improved visual aesthetics.

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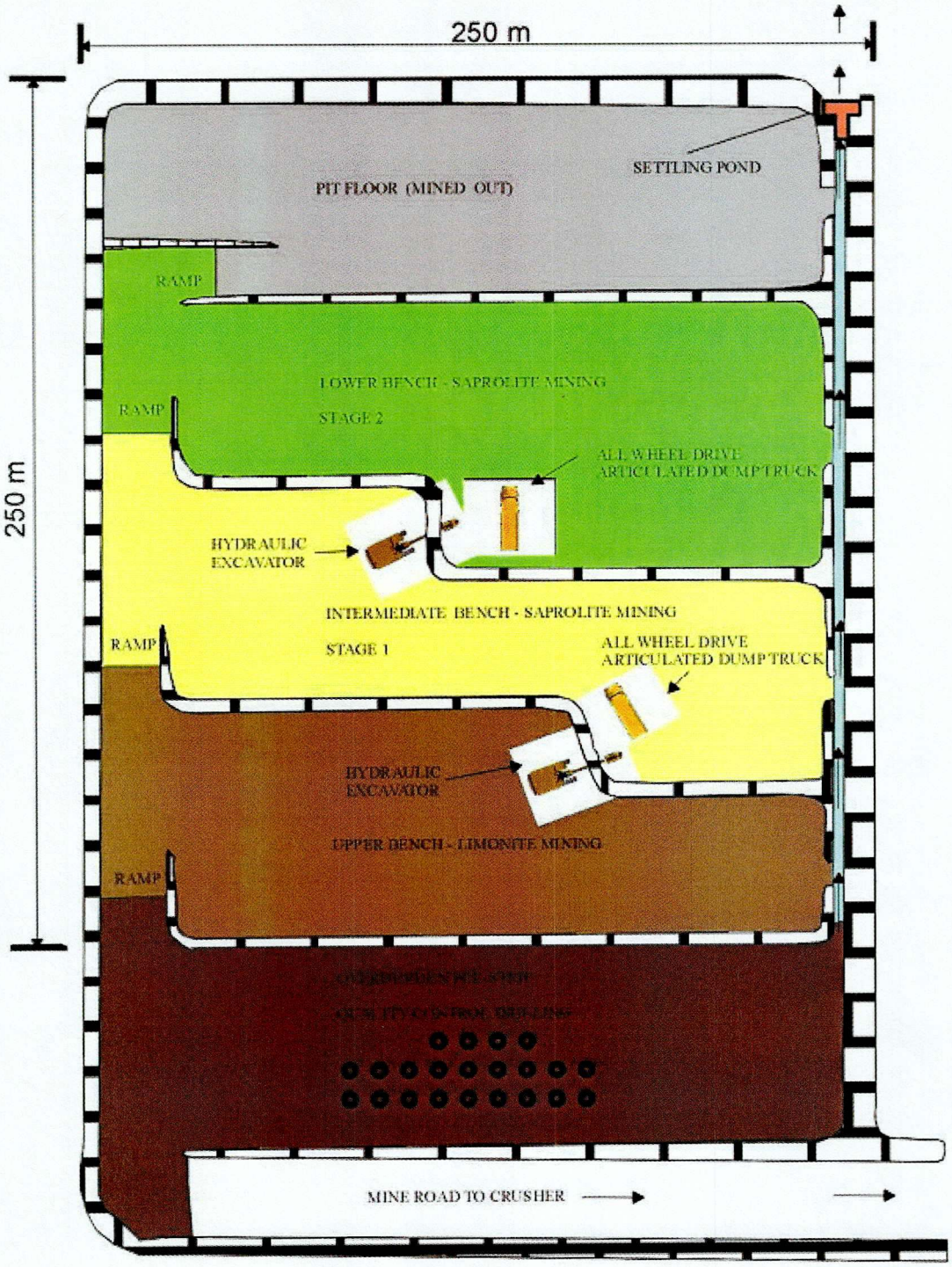
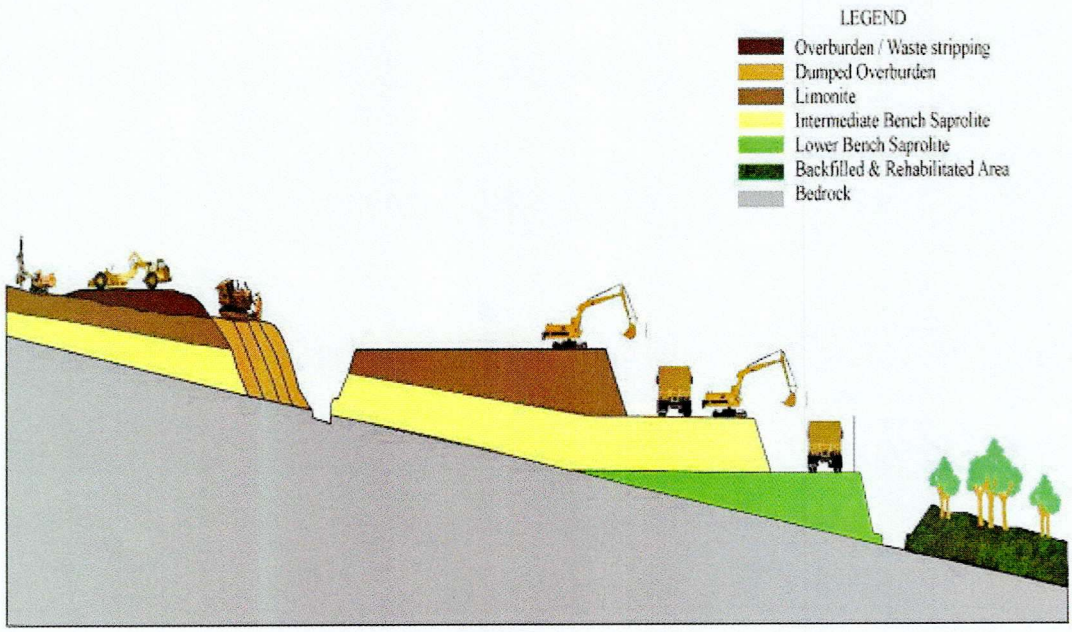
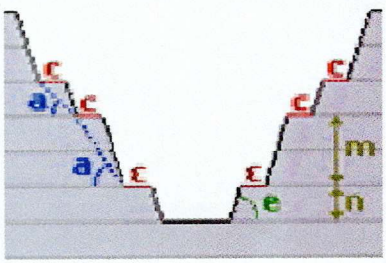


Ideal Mining Sequence – Plan View



Ideal Mining Sequence - Section View

Design Parameters:



e = Batter angle	: 45°
a = Pit-slope (inter-bench) angles	: 70°
n = Bench height (from plan view)	: 3m
c = Berm width	: 3m
Road Width	: 20m

Mine Facilities

After the issuance of the ECC and mining permit to EMI, construction of mining infrastructures will commence, i.e., assay laboratory, mechanical shop, training center, clinic, nursery and other relevant mining structures that will be used during the operational phase of the project. Additional earthworks may be carried out for the widening of the road networks and construction of a pier jetty at Barangay Naulo or Barangay Uacon.

The proposed constructions of a pier jetty/causeway in both barangays will still an option of the company. Once the confirmation of the additional reserves in the area located at the southern part (Barangay Uacon, Candelaria) and at the northern part (Barangay Naulo, Sta. Cruz) will be established then the company will apply for another environmental compliance certificate and permit for the construction of the said structures. For the meantime, the company will be utilizing the Acoje pier through the Municipality of Sta. Cruz.

Earthworks and Road Works

Haul Roads

A total of 35.7 km of a 16-meter width haul road will be improved and developed for the project. This includes the existing 14.0 kilometer Acoje Road that will be widened, improved and maintained.

- In-Pit = 21.7 km
- Acoje Main Road = 14.00 km

Drainage Canals

Establishment of a good drainage system is another important factor for smooth mining operations, especially during the wet season. This will likewise mitigate erosion and siltation concerns in nearby water bodies.

Concrete rip-rapped and open simple channels will be constructed by EMI during its operations. This will include about 8.70 km and 13.0 km of road drainage canals within the vicinity and periphery of the South & North Block mining areas, with a dimension of 1.0 meter at the top and 0.5 at the bottom and a depth 0.75 of meter. Such structures were defined to divert runoff so as to minimize siltation and contamination at water bodies and ore stockpiles.

- North Blocks Drainage System = 8.70 km
- South Blocks Drainage System = 13.0 km

Settling Ponds

Prior to mining operation, two (2) settling ponds will be constructed at strategic locations. The design of the proposed settling ponds will take into account factors of stability, holding capacity, strength of foundation materials to withstand intense ground movement. Basic information on the design of the settling ponds is described as follows:

Design Parameters:

- Top of Dike = 8.0 m
- Slope ratio of dike = 1 : 2 (downstream and upstream)
- Height of dam = 8.0 meters (height of dam)

North Settling Pond = 3.00 ha.

- 210,000 m^3 (Impounding Cap.)
- 200.00 masl (top dike elevation)
- 192.00 masl (bottom elevation)

South Settling Pond = 3.00 ha.

- 210,000 m^3 (Impounding Cap.)
- 190.00 masl (top dike elevation)
- 182.00 masl (bottom elevation)

The drainage from the mining pit particularly along the haul roads will pass to the different silt traps before it will drain to the series of settling ponds. The size and capacity of these siltation ponds varies with the expected volume of water coming into it. The settling ponds will be constructed along the perimeter of the disturbed areas. These ponds and silt traps will be inspected regularly and desilted as necessary to remove the deposited silt and ensure its desilting capacity. Desilted silts from silts traps and ponds will be sampled. Normally, these silts have high nickel content and will be blended with the ore for shipment. Silt with low nickel content shall be stockpiled and may be used as backfilling materials for rehabilitation.

The settling ponds were designed taking into account its carrying capacity to handle maximum precipitation and stability. To augment silt ponds in order that clear water is discharged into natural waterways, silt dams/traps even back-up settling ponds were built on strategic areas. These silt traps/dams

would contain silts not contained by siltation ponds. Also additional settling ponds will be constructed once the confirmation of additional reserves in the area will be established.

Both settling ponds will be monitored and maintained to ensure its holding capacity. EMI personnel will periodically monitor the settling ponds. It will be inspected prior the onset of the rainy season or the arrival of a typhoon. During and after heavy downpour and/or typhoon, EMI will regularly monitor the settling ponds to assess its condition and efficiency. A parallel monitoring will also be conducted by the MMT on said silt ponds.

Removal of silt and other materials in the settling ponds will be made regularly, to ensure its intended holding capacity. However, regardless of its current capacity, settling ponds will be desilted prior to the onset of the rainy season and prior to the arrival of a typhoon in the area. The nickel laterite and ores taken out in the settling ponds will be assayed for its grade. Should the grade passes the cut-off, it will be blended with the ore in the stockyard - otherwise, it will be hauled to the waste dump.

Run of Mine Pad

Ore Stockyards and Pier yards

Two ore stockyards will be established prior to the implementation of the project. These structures will be constructed within the vicinity of the mining area to minimize hauling distance and time hauling distance, at a maximum of 2.0 kilometers from the farthest mining area described as follows:

- North Ore Stockyard = 15.0 hectares
- South Ore Stockyard = 11.0 hectares

A Pier yard covering an area of about 5.0 ha will also be established during the project. The Pier yard shall accommodate ore materials ready for shipment.

Surface elevation of the stockpile area will be designed to effectively divert runoff towards the drainage channel purposely established at the flank, leading to the settling ponds.

Construction of Support Facilities

To achieve the company's desired production, adequate office and operational facilities must be constructed. These are:

Structure	Area (hectares)
Ore Stockyard	26.0
Waste Dump Area	22.0
Office buildings	0.25
Motor pool / ME Shop	0.25
Bunkhouses & Recreational Facility	0.03
causeway	0.30
Pier yard	5.00
Total	53.83

Stripping of Overburden and Stockpiling

Overburden Stockyards

The selection of waste dump area selection is likewise a critical factor considered in the mine design, development and equipment selection since it affects the production cycle of the operation. To minimize hauling distance of waste materials, two (2) waste dump areas will be developed, one in the South and North area.

The South waste dump covers an area of about 11 ha. and is located approximately 400-meter long haul road west of the mining area within the coordinates 395,840E, Northing 1,736,452N.

The North Overburden Stockyard likewise covers an area of about 11 ha. with a distance of 500-meter long haul road north of the mining area located within the following coordinates 379,000E and 1,741,000N. The North Overburden Stockyard is designed to accommodate the projected increase of overburden materials based on the potential reserves of the area that need to be explored with detailed infill drilling data.

Since mining operation will be in parcels, progressive rehabilitation will be followed and implemented. This means that after fully mining-out a particular mine parcels, rehabilitation follows immediately. Earth materials hauled to overburden stockyards will be used to physically rehabilitate the area, thus the holding capacity and even the proposed maximum height of the said stockyards will not be maximized or reached.

Calculation of the capacity of each dumpsite was computed using the following design parameters:

Soil Material Swell Factor	=	1.35
Tonnage Factor	=	1.10 metric tons/cubic meter
Method of Calculation	=	End-Area Method from Cross-sections

South Overburden Stockyard

Top elevation	=	560.0 m asl.
Bottom elevation	=	350.0 m asl.
Berm Height	=	10.0 meters
Berm Width	=	20.0 meters
Berm Slope	=	42–45 degrees (Backfill Material Angle of Repose)
Waste Dump Slope	=	25 degrees
Capacity	=	5,000,000.00 metric tons
Area occupied	=	11.00 hectares

North Overburden Stockyard

Top elevation	=	300.0 m asl.
Bottom elevation	=	140.0 m asl.
Berm Height	=	10.0 meters
Berm Width	=	30.0 meters
Berm Slope	=	42–45 degrees (Backfill Material Angle of Repose)
Waste Dump Slope	=	25 degrees
Capacity	=	4,500,000.00 metric tons
Area occupied	=	11.0 hectares

Location of these dumpsites was chosen after careful evaluation of drilling data and proximity to the mining areas. Safety and environmental factors we also considered like water runoff during heavy downpour that may result to liquefaction of the structure and sedimentation problems downstream. Drainage channels will be established to redirect the runoff away from the dumpsites and stockyards and towards the assigned settling pond in the area.

The overburden will be used for rehabilitation of mined-out areas. Additional materials will be sourced from the top soils in the same areas which were scraped and scrubbed prior to mining operation. These materials were set aside to designated areas for later use in rehabilitation works. No additional material will be sourced outside the MPSA area since the volume of the overburden will be sufficient to rehabilitate the mined out areas.

Design of the Causeway

A Causeway is proposed to be constructed either at Bgy. Uacon in Candelaria or Barangay Naulo in Sta. Cruz as an alternative to Acoje Pier. The perimeter of the Causeway will be provided with mixed aggregate materials to serve as a barrier (buffer-berm) to prevent discoloration or siltation of the coastal waters that may result from accidental mass wasting of the stockpiles. The perimeter will also be tilted at the flank to divert runoff away from the seaside toward the sumps constructed onshore. These sumps will also collect runoffs coming from the road above the Causeway.

The proposed constructions of a pier jetty/causeway in both barangays will still an option of the company. Once the confirmation of the additional reserves in the area located at the southern part (Barangay Uacon, Candelaria) and at the northern part (Barangay Naulo, Sta. Cruz) will be established then the company will apply for another environmental compliance certificate and permit for the construction of the said structures. For the meantime, the company will be utilizing the Acoje pier through the Municipality of Sta. Cruz.

Stockpiling at the Pier Yard

A week before the shipment schedule, ores will be temporarily stockpiled at the pier yard. A 50,000 WMT shipment, will take about 4.5 days of materials hauling to and fro the mine stockyard and the pier stockyard. During successive shipments, ores are directly hauled and loaded into barges. The desired moisture content of ores for shipment is 35%. To maintain this moisture level, ore stockpiles will be covered with broad canvass sheets to prevent saturation during rainy days and minimize dust generation during dry months.

2.1.5 Estimated Production

The projected annual production of EMI ranges between 600,000 – 1.5 million WMT of nickel silicate ores. The computed waste to ore ratio is 1.44:1.0

2.1.6 Ore Process

The company intends to ship the ore directly to the buyer. However to fulfill the required shipment grade, may have to process the ore by grade quality control through crushing, screening, blending and as well as drying to reduce the moisture content.

To achieve the proper ore blending, saprolite ores will be crushed using manual breaking.

Direct shipping of Nickel ore requires no processing except beneficiation by manual breaking before shipment. The ore may need to be dried in windrows at the stockyard to reduce the moisture content to a suitable content prior to shipping.

The ore will be loaded on 25T dump trucks and hauled to designated stockpile areas at the mine site or at the pier stockyard. The dump trucks will operate uncovered on roads within the mine areas and will be sheeted on mine haul roads during hauling to the stockyard and eventually to the pier.

2.1.7 Proposed Mine Life (years)

The initial mining activities will be conducted at Block 5 and Block 7 with both blocks operated for a period of 12 years. Life of mine will depend on the confirmation of additional ore resource which is yet to be established.

2.2 MINERAL RESERVES / RESOURCES

Table 2.2-1 shows the ore classification that will be adopted by EMI in establishing and identifying its ore resources throughout the project's mining operation.

Table 2.2-1. Ore Classification

Ore Classification	Grade Range	
	% Ni	% Fe
LFO (CHINA)	0.8 – 1.20	≥ 45
LGL	1.2 – 1.99	≥ 20
HFO	≥ 2.00	≥ 20
LGS	1.60 – 2.00	<20
MGS	2.00 – 2.19	<20
HGS	≥ 2.20	<20

Based on this ore classification, a mineral resource estimate is generated as shown below:

Table 2.2-2. Mineral Resource Estimate Using the Ore Classification

New Ore Classification	DMT (Million Tons)	% Ni	% Fe	% Co
LFO	0.36	0.94	47.53	0.02
LGL	5.32	1.46	27.50	0.08
HFO	0.53	2.25	28.50	0.07
LGS	7.79	1.77	13.25	0.03
MGS	1.19	2.08	13.25	0.04
HGS	0.89	2.45	13.45	0.04
TOTAL	16.08	1.72	19.24	0.05

EMI partially blocked probable ore reserves encompassing an area of about 212 hectares (Block 5 = 81 ha; Block 7 = 131 ha). Estimated tonnage is 11,977,342.77 WMT with an average ore grade of 1.88 % Ni and 15.02 % Fe (Table 2.2-3).

Table 2.2-3. Mineral Resource Estimate showing Grade and Stripping Ratio

Block 5	Ore		Grade			Waste	SR
	DMT	WMT	%Ni	%Fe	%Co	DMT	
PIT 10	101,849	156,691	1.88	18.84	0.09	114,861	1.13
PIT 11	54,675	84,115	1.66	16.27	0.05	68,576	1.25
PIT 12	94,363	145,173	1.81	15.08	0.06	170,628	1.81

PIT 13	933,891	1,436,756	1.95	12.78	0.20	1,193,011	1.28
PIT 14	129,026	198,502	1.83	9.21	0.03	151,825	1.18
PIT 15	575,578	885,505	1.84	15.84	0.08	564,846	0.98
PIT 16	149,659	230,244	1.81	12.92	0.02	336,610	2.25
PIT 17	912,979	1,404,583	1.93	12.86	0.19	1,816,140	1.99
PIT 18	181,955	279,930	1.97	12.55	0.16	169,170	0.93
PIT 19	195,054	300,083	1.81	9.79	0.02	194,246	1.00
PIT 20	170,795	262,762	2.02	20.34	0.05	230,319	1.35
Subtotal	3,499,824	5,384,344	1.90	13.66	0.11	5,010,233	1.43

Block 7	Ore		Grade			Waste	SR
	DMT	WMT	%Ni	%Fe	%Co	DMT	
PIT 1	359,125	552,500	1.73	16.54	0.06	353,511	0.98
PIT 2	93,285	143,515	1.66	16.32	0.05	576,650	6.18
PIT 3	420,166	646,410	1.80	18.44	0.06	404,604	0.96
PIT 4	907,193	1,395,681	1.84	14.97	0.04	877,296	0.97
PIT 5	1,303,625	2,005,577	1.88	14.55	0.05	1,638,449	1.26
PIT 6	283,845	436,685	1.80	13.62	0.04	248,939	0.88
PIT 7	331,215	509,562	2.06	9.82	0.30	683,889	2.06
PIT 8	399,409	614,475	1.96	12.30	0.21	1,151,378	2.88
PIT 9	187,586	288,594	1.75	14.93	0.03	304,471	1.62
Subtotal	4,285,449	6,592,999	1.86	14.60	0.04	6,239,187	1.46

Area (Summary)	Ore		Grade			Waste	SR
	DMT	WMT	%Ni	%Fe	%Co	DMT	
Block 5	3,499,824	5,384,344	1.90	13.66	0.11	5,010,233	1.43
Block 7	4,285,449	6,592,999	1.86	14.60	0.04	6,239,187	1.46
Total / Avg.	7,785,273	11,977,343	1.88	14.18	0.04	11,249,419	1.44

There is a great possibility that additional ore reserves can be blocked at adjacent sites within the mining claim since exploration to delineate additional ore reserves is still ongoing.

Out of 4,619.68 hectares, it is estimated that only 120.0 hectares will be disturbed by the project, which translates only 3.11% of blocks 5 and 7. The remaining area will be further explored for potential resource.

2.3 ACCESS / TRANSPORTATION

2.3.1 Road (Preference and Alternates)

The mine site is about 5.5 hours travel from Manila via the Olongapo-Zambales National Road. A total of 35.7 km of a 16-meter width haul road will be improved and developed in the project. This includes the existing 14.0 kilometers Acoje Road that will be widened and improved.

In-Pit Roads

- Block 5 = 8.70 km
- Block 7 = 13.00 km
- Main Road (Acoje) = 14.00 km

2.3.2 Air Access (origin and destination points)

The nearest airports to the project site are the Subic airport and Clark International Airport. The terrain of the project does not make it possible to construct an airstrip at the site.

2.3.3 Shipping

EMI's causeway is proposed to be constructed either at Bgy. Uacon in Candelaria or Barangay Naulo in Sta. Cruz as an alternative to Acoje Pier. The perimeter of the causeway will be provided with mixed aggregate materials to serve as a barrier (buffer berm) to prevent the siltation of the coastal waters that may result from accidental mass wasting of the stockpiles. The perimeter will also be tilted at the flank to divert runoff away from the seaside toward the sumps constructed onshore. These sumps will also collect run-offs coming from the road above the Causeway.

2.4 POWER SUPPLY

2.4.1 Requirements

Power requirement of the company will be supplied by the local electric company. A twenty four-hour service is generally offered by the local electric cooperative.

Since the company will not construct a processing plant, only offices, housing and other structures that will require electricity. The power requirement of the project will be supplied by Zambales Electric Company (ZAMECO) through a 37.5 KVA distribution transformer. Standby portable generator sets will also be provided in cases of power outage.

2.4.2 Supply Alternatives

In case of outages, an alternative power supply will be provided by a diesel powered 75 KVA generator set. This can adequately supply power for office lightings, copier machine, computers, air conditioners, and the Atomic Absorption Spectrophotometer (AAS) of the Assay Laboratory.

2.5 MINING EQUIPMENT

2.5.1 List of Mobile / Fixed Equipment

Table 2.5-1 shows the list of equipment and service vehicles to be used by the company.

Table 2.5-1. Summary of Equipment needed

Equipment Type	No. of Units
 Conventional DTs 10 cu.m. cap.	51
 Articulated DTs 25T cap.	11
 Hydraulic Excavators Track Excavators cap 1.2 cu.m.	6

	Hydraulic Excavators (Track Loader cap 2.1 cu.m.	1
	Crawler Tractor	5
	Wheel Loader	3
	Road Grader	2
	Sevice Vehicle (KIA, Strada, DELICA)	22
	Fuel Lorry 12 Kiloliter cap	1
	Water Truck 12 Kiloliter cap.	4
	Pump Boat 2 tons cap.	1

Below are the list of different processing equipment and various laboratory apparatus:

- 1 unit Mine Jaw Crusher
- 1 unit of Screen
- 1 unit Laboratory Crusher

Various Assay Laboratory equipment and material to be used consists of basic instrumentation, glassware, and chemical reagents in its daily assay of the metal content of samples.

- Atomic Absorption Spectrophotometer
- Titration apparatus
- Drying Oven
- Distilling Apparatus
- Pulverizer
- Analytical Balance
- Laboratory Glassware
- Chemical reagents

2.6 Workforce Information

The manpower strength of the project during normal operation consists of 73 Staff and 566 Rank and File/Contract Workers. Majority of the workforce will be sourced locally from the host or neighboring communities of Sta. Cruz. Distribution of manpower per department is shown in Table 2.6-1.

Table 2.6-1. Manpower Requirements

Department	Staff	RF/Contract	Total
Mining Department	22	111	133
Mine Engineering/Geology Department	13	23	36
Heavy Equipment Department	7	252	259
Construction & Services Department	7	18	25
Administration Department	9	46	55
Socio-Environment, Sanitary & Health Department	6	16	22

Quality Control/Assay Lab	4	75	79
Office of the Resident Manager	1	1	2
Safety Department	4	24	28
TOTAL	**73**	**566**	**639**

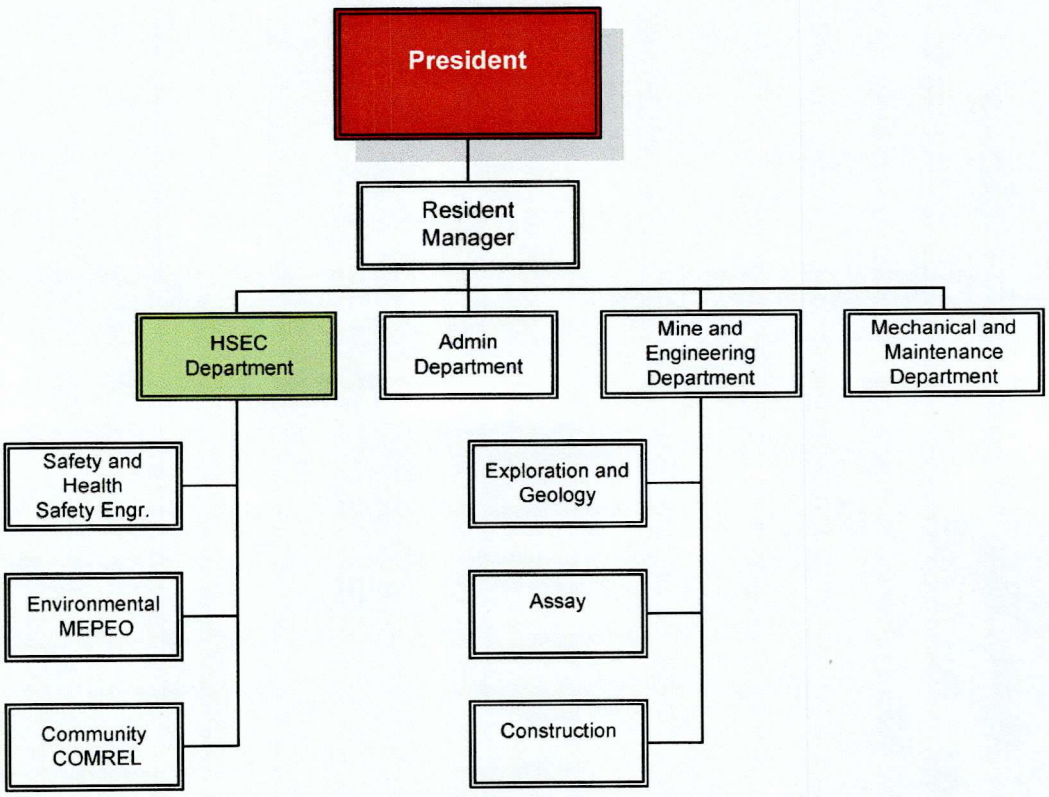


Figure 2.6-1. Table of Organization of EMI Minerals Incorporated

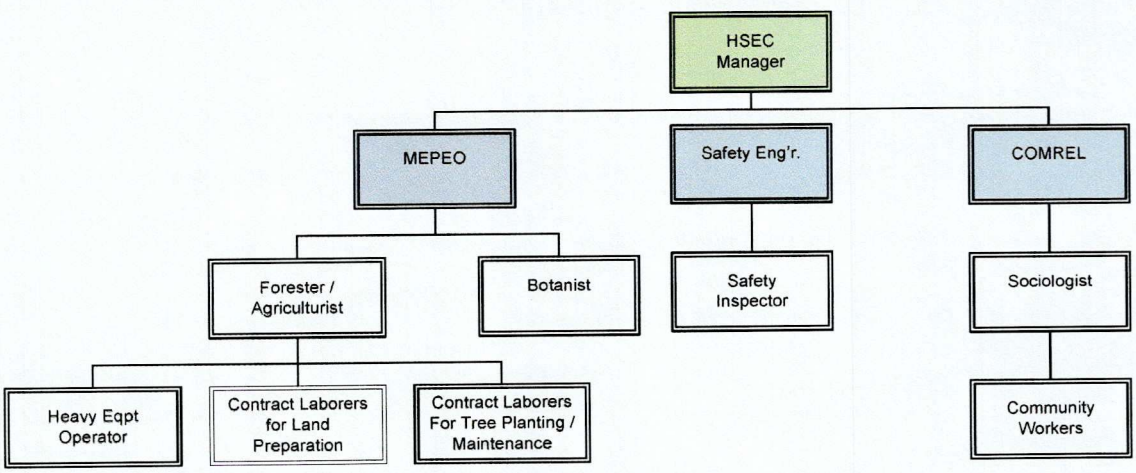


Figure 2.6-1.1 Health, Safety, Environment, Community (HSEC) Department Structure

2.7 DEVELOPMENT SCHEDULE

Site construction/development shall commence immediately after the approval of this EPEP. The schedule of activities is shown in Table 2.7-1.

Table 2.7-1. Pre-Operation and Development Stage

Activities	Week									
	1	2	3	4	5	6	7	8	9	Remarks
1. Equipment Mobilization										
2. Access Road Improvement/Widening										
3. Construction of Mine Facilities										
Assay Laboratory										
Mine Office, Warehouse, Mine Pit Office										
Temporary Bunkhouse Structure										
Motorpool/Mechanical Shop										
Sample Preparation House										
Sampling House										
4. Mine Environmental Structures										
Ore Stockyards/Beneficiation Area										
Settling Ponds/Sumps (2 units)										
Drainage System										
Pier yard										
Barging area/Causeway										
5. Extraction of Minerals										
Stripping of Minerals										Continuing
Ore Mining (Continuing)										Continuing
Ore Stockpiling (Continuing)										Continuing

3.0 ENVIRONMENTAL IMPACTS AND CONTROL

3.1 LAND RESOURCES

3.1.1 Acceptable Impacts

Since every mining activity will require removal of soil and rock materials, changes to land form are unavoidable impacts. This will be most visible during extent of the project and will diminish nearing the 12th year of the operation. It is anticipated that earth moving and land deformation shall be a consequential part of the mining method; therefore appropriate environmental mitigating measures shall be implemented in conjunction with all the phases of the operation.

Haul Roads

A total of 35.0 km haul road with a 16-meter width will be developed in the project. This includes the existing 14.0 kilometer Acoje Road that will be widened, improved and maintained.

- In-Pit Roads
  - Block 5 = 8.70 km
  - Block 7 = 13.00 km
- Acoje Haul Road = 14.00 km

Since vegetation will be removed and soils loosened during stripping of overburden and strip mining of nickel laterite, accelerated erosion will take place. The low lying portions of the mining area could be silted and may affect tributaries, creeks and the main drainage system in the area.

Active Mining Area

Both the local terrain and topsoil will be affected by the mining operation resulting to unavoidable change in land form. The open pit operation shall be the most notable impact of the operation. The whole dimension of the opening shall be based on the extent of the ore body with the pit limits extending farther outward than the ore body. A technical approach to this extraction operation shall be taken up in the succeeding control strategies.

Production benches are identified to pose the biggest impact to the environment as this phase will be the most active area throughout the operation. Land deformation, noise, and dust generation are among the environmental impacts identified during this phase.

The initial mining activities will be conducted at Block 5 and Block 7 with both blocks operating for a period of twelve (12) years. However, mining activities, targets, and schedules will be adjusted upon the confirmation of additional ore resources delineated in the exploration.

The stripped overburden will be temporarily pushed or dumped and compacted on depressions and flat ground away from natural slopes. These waste materials will be used in future rehabilitation and restoration of mined out areas. Removal of vegetation and stripping overburden shall be limited to programmed areas to reduce its impact to the environment. Subsequently, ore stockpile area will be prepared at the mine site and near the pier.

Table 3.1-1. Estimated Disturbed Area (Mine Pit Area)

Mine Pit	Hectares

Pit 1 & 2	20.0
Pit 3 & 4	20.0
Pit 5	15.0
Pit 6	15.0
Pit 7	15.0
Pit 8	10.0
Pit 9	15.0
Pit 10	20.0
SUB-TOTAL	120.0

Mine Waste and Overburden Stockyards

The South waste dump is about 11ha and is designed to hold 5.0 M metric tons of materials. The North waste dump is likewise 11ha but designed to hold 4.5 M.

Since mining operation will be in parcels, progressive rehabilitation will be followed and implemented. This means that after fully mining-out a particular mine parcels, rehabilitation follows immediately. Earth materials hauled to overburden stockyards will be used to physically rehabilitate the area, thus the holding capacity and even the proposed maximum height of the said stockyards will not be maximized or reached.

Stockpiling at the Pier

Stockyard in the Pier area is about 5.0 ha. Its construction will involve minor earth movement.

Large volume of stripped materials and ores are piled in overburden stockyards and ore stockpiles at the pier for ready shipment. The risk of soil erosion and surface runoff is high particularly during rainy season. Runoff coming from these areas is heavily silted that will eventually end up in creeks and in bodies of water, if not properly controlled or managed, increasing water turbidity and threatening aquatic life. Constant sedimentation of water bodies may eventually cover and dry up the area, destroying its resident biodiversity.

Siltation Ponds

Construction of siltation ponds will disturb approximately six (6) hectares. Development of the siltation pond requires minimal earth movement mostly limited on embankment that would serve as catchment for runoff sediments.

Siltation/settling ponds structures are primarily constructed as pollution control facilities, may still be a possible source of water pollution. These structures impound large volume of runoff and silts. In the event of dike failure, large volume of highly turbid water will flood the receiving water bodies causing sedimentation and loss of aquatic habitat, thereby losing also marine/aquatic flora and fauna in the area.

Support Facilities

Support facilities such as Offices, Motorpool and Mechanical Shop, Staff quarters, recreational facilities, parking, etc. will be erected on a combined area of 0.73ha.

3.1.2 Control Strategies

Within the project site, a dramatic change in topography is an unavoidable impact of the mining operation. However, progressive rehabilitation of the mined-out areas using materials previously dumped to

overburden stockyards may partly restore the topography. Landform change will also be buffered by delineation of buffer zone undertaken prior to earthmoving works. Mining in parcels will also be followed by progressive rehabilitation. This means that after fully mining-out a particular mine parcel, rehabilitation follows immediately. Earth materials hauled to overburden stockyards will be used to physically rehabilitate the area, consistent with its natural landform whenever possible.

Rehabilitation activities will be implemented as follows:

- All areas affected by the mining operations will be rehabilitated. These include all mining facilities such as stockyards, access and haul roads, settling ponds, and mined-out mine pits;
- Pre-revegetation activities such as re-contouring of land configuration, surface preparation, and soil enrichment will be undertaken prior to actual planting;
- Local species when possible will be used to revegetate the mined-out areas.

While topographic modification is intrinsically unavoidable, the over-all landscape will have better ecological and aesthetic appeal as a result of continuous reforestation activities alongside physical rehabilitation of mined-out areas.

As part of the company's control strategy, a nursery will be established within the disturb areas to sustain production of seedlings for every planting season. It will cover an approximately 6,000 m^2. It has a 30,000-seedling capacity. Nursery facilities include an office, stockroom, hardening area, and germination shed. The nursery will be maintained throughout the implementation of the final mine rehabilitation and decommissioning of the area. Plan for satellite nursery/ies will be constructed, if the areas for rehabilitation through reforestation will be too far from the main/central nursery.

3.1.2.1 Progressive Rehabilitation

EMI is committed to pursue the progressive rehabilitation of mined-out areas deemed no longer relevant to its operation. Mined-out areas shall be backfilled, re contoured, and revegetated with fast growing and possibly fruit-bearing trees adaptable to the condition. This will be maintained and monitored using the allotted logistics for this program. In unstable slopes, appropriate grass species shall be introduced to prevent erosion and siltation of natural waterways.

Tree planting shall be done during rainy season to increase the survival rate and lessen the maintenance through watering. The aim of the vegetation cover to be introduced in the mined-out areas is to sustain growth, slope stability, and prevent erosion.

The area scheduled for rehabilitation and tree planting will follow the sequence of mining. The mined out area will be the subject of rehabilitation for the succeeding year. During the initial year, the focus of revegetation is to establish buffer zones for the mine facilities particularly in Block 7. From year 1 to 7, all mining activity will be conducted in Block 7 hence, from Year 1 to 8, progressive rehabilitation will be focused in Block 7. From year 8 to 12, the mining activities will rehabilitation of mined out areas will be focused on block 5.

Rehabilitation of mined-out areas will be conducted immediately once the mined-out area has been assessed for other potential mineral deposit.

3.1.2.2 Rehabilitation Standard

Impact mitigation due to changes in the terrain will consist of regrading and revegetation as part of the rehabilitation plan. Some permanent changes to the landscape will however occur. These include the quarry area, waste dump area and stockpile area. Final regrading and revegetation will be performed in a manner to blend the changed topography with the natural topography.

Soil loss will focus on control and prevention of erosion and sedimentation within local streams and waterways. This will be accomplished by construction of diversion ditches to minimize surface runoff contact with disturbed areas and construction of sediment ponds for treatment prior to discharge to the natural creeks.

Rehabilitation using natural plants and vegetation will be performed both during and after mining operations. A more detailed plan will be included in the Annual EPEP.

In all of these stages, EMI is contemplating setting up a small nursery in coordination with the Forest Management Sector of the DENR for the possible seedlings to be raised adaptable in the area.

3.1.2.3 Rehabilitation Methods

The following procedures will be implemented by EMI:

1. Properly defining the slopes of the benches and the pit and see to it that they are stable and conform to the mining plan.
2. Re-soiling of mined-out areas and if possible ripping of hard surface to allow plant roots to penetrate for the necessary nutrients for its vigorous growth.
3. Top soil will be spread on the mined-out areas.
4. Slope stabilization of the pit that is not yet rehabilitated. All depressions resulting from the excavation will be progressively backfilled with overburden materials and low grade materials from development workings. The backfilled and leveled areas will be completely reforested.
5. Self-propagated trees and seedlings will be planted in the prepared areas. For forest tree species, these will be planted at no less than 2 meters x 2 meters interval up to 8 meters x 8 meters maximum interval depending on tree species and expert recommendations.
6. Planting of grasses, trees and fruit bearing trees on mined-out and rehabilitated areas. This activity and determining the most suitable plant specie will be done in coordination with the Municipal Environment and Natural Resources Office, the PENR and CENR Offices.
7. Proper maintenance will be introduced on new plant trees, i.e. - the application of necessary quality and quantity of fertilizers, soil conditioning, watering of sapling, possibly spraying of insecticides and weeding of undesirable grasses.
8. Care and maintenance for newly planted trees will be sustained for two (2) years or until their survival rates are high.
9. Defining the drainage system
10. A buffer zone along the perimeters of support mine structures (i.e. stockyards, siltation ponds, etc.) and on the perimeter of the active mine areas will be established. These buffer zones will be from 10-20 meters.

3.1.2.3.1 Pre-mining Preparation

Pre-mining preparation will consist of two primary activities; topsoil management and establishment of a nursery. These two activities will also continue throughout the mining operations.

For the purposes of rehabilitation, "topsoil" is defined as that part of the soil profile that provides a suitable medium for plant establishment and growth. It may include several recognizable soil horizons overlying bedrock.

Where an adequate thickness of topsoil exists within areas to be excavated or covered with waste rock and, where slopes allow for safe excavation and transport, the topsoil will be removed, set aside and eventually spread on disturbed areas to assist in rehabilitation. Should the schedule allow, the topsoil removed from one area will be immediately pushed on the adjacent mined-out area. This will ensure maximum viability of the seed stocks contained in the soil. In some circumstances, however, suitable areas will not be available to accept newly removed topsoil. In these cases, the soil will be stockpiled until such time as suitable areas become available for rehabilitation.

Stockpiling of soils will be done in designated areas and protected from mixing with unsuitable materials. Criteria associated with topsoil stockpiling are as follows:

- Dump in low mounds not more than 2 m in height.
- Revegetate the stockpile to protect the soil from erosion.
- Locate stockpiles where they will not be disturbed by future mining activities.
- Strip topsoil only when moist or dry and not wet.

Areas designated for topsoil management will be dependent on construction activities and scheduling. These will be identified within the Annual EPEP.

To ensure a higher degree of success in revegetation, young plants will be raised first in nursery conditions. The nursery will be the center for project revegetation and rehabilitation activities. Objectives of the nursery will be to provide seedlings and seeds for transplanting, experimentation/evaluation of planting techniques, and selection of the most appropriate revegetation species. Establishment of a nursery is planned prior to initiation of full scale mining operations.

Mindoro Pine saplings that will be encountered in areas to be mined or disturb will be balled and brought to the nursery for replanting on designated areas.

3.1.2.3.2 Final Land form Design

Prior to final rehabilitation, a land use plan will be prepared for the claim block area and disturbed lands. This will be done in conjunction with Local Government Units and Non Local Government Units. Items to be determined will include which roads will remain, removal of all or selected buildings and equipment, and overall watershed management. There are no plans for residential, commercial or recreational development.

The mine site will level at a certain elevation capable of sustaining life in the environment similar to its original use. The final landform will have a slightly sloping ground within a series of planned benches. The area will be used for agro-forestry or agro-industrial areas capable of generating enough income in replacement for the present benefits.

Trees and appropriate grass species will be introduced in slopes perceived to be susceptible to erosion. Structures, buildings utilities and other facilities will be removed.

3.1.2.3.3 Surface Preparation

All disturbed areas will require some form of preparatory activities prior to revegetation. These will vary depending on the configuration, topography, accessibility and land use of the area to be rehabilitated as well as the particular phase of activities; construction, operation and closure. A critical aspect to surface preparation is the slope of the ground surface of stockpile and mining area. Slopes steeper than 2.5 horizontal to 1 vertical are especially susceptible to erosion.

Newly planted vegetation on these slopes will be subject to loss by erosion. Wherever possible, benching will be performed to limit the area of steep slopes and maximize the area of flat or gently sloping surfaces. Final benching parameters and procedures will depend on geotechnical considerations and physical configurations of the disturbed area. The waste stockpile and the mining areas will be the primary disturbed areas subject to benching. For those slopes that cannot be benched, modified slope control methods will be used. These consist of constructing small width terraces across the slopes and/or placement of logs perpendicular to the slope at intervals up and down the slope face. For those areas with steeply sloping faces or areas subject to excessive erosion, a surface net consisting of woven abaca fibers or coco coir may also be used. This net will be staked to the surface and reclamation vegetation will be planted within the net spaces. The net will reduce soil loss thereby allowing the root system to become

established and protect the surface from erosion. The netting material will degrade over time and will provide a mulch and nutrient source for the individual plants.

Wattling techniques will also be used for stabilization of steep slopes. This Best Mining Practice consists of interweaving live bamboo or rattan into a mat or crib structure and filling the spaces with topsoil and vegetation. As the material degrades, it provides a mulch and nutrient source much like the abaca net.

Gabions also provide a means for erosion control and soil stability. Wire cages are filled with rock and soil and placed on steep slopes. Acting like a small flexible soil retaining wall, the gabions will support vegetative growth eventually blending into the natural landscape.

3.1.2.3.4 Revegetation Method

After mining, the mined-out area will be immediately re-vegetated. Slopes that are susceptible to erosion will be planted with grasses adaptable to the area. Fruit-bearing trees will also be introduced to become useful to the economic projections. Indigenous forest trees to be propagated in the nursery will also be introduced in some barren areas to necessitate the vegetation cover.

3.1.2.3.5 Maintenance

The designated Mine Environmental Protection and Enhancement Office (MEPEO) of EMI shall be responsible for the care and maintenance of the planted trees and the nursery. Regular and periodic inspection of planted trees and other species shall be included in the program. In addition, maintenance of nursery will also be properly undertaken to meet the seedling requirements of EMI annually.

Location of species to be planted is also an important factor. Recent practices have recommended separation of species to prevent large scale destruction by pest or disease. For benched or terraced areas, a single primary species should be planted on one bench while a different primary species is planted on a different bench.

Plant species to be used in rehabilitation depend upon the location of the terrain to be rehabilitated rather than on the phase of the project. The species designated for rehabilitation use and experimentation are all native or naturalized to the project locality. They may be chosen primarily on the basis of abundance and occurrence in a relatively wide range of sites. Such species are expected to have wider ecological tolerances than many other species found in the project area. Some species have been widely observed to colonize disturbed areas (tree fall gaps, logged areas, and landslide clearings), and these will be used to establish a rapid vegetation cover. However, these colonizing species are small, relatively short-lived herbs, shrubs or trees. In order to restore the original forest structure and species composition, longer-lived species that compose the majority of the present mature forest canopy will also be planted.

3.2 WATER RESOURCES

Impacts associated with the Water Resources of the area focus on changes in the drainage patterns, changes in water yield of the affected watersheds and potential water quality degradation. All these potential impacts are common to mining projects and can be mitigated and controlled.

The major potential impact of mining operation on water quality of both surface and marine waters is siltation or increase in the mount of suspended solids (fine silt materials) that are harmful to aquatic life. The magnitude of the impact is highly perceptible since receiving water bodies experience turbidity in the event of a heavy downpour. The operation phase consists of a flurry of activities such clearing, stripping and mining, hauling, piling and hauling of ores to foreign vessel. More areas will be opened up for mining just to meet the annual target. Additional construction and establishment of mine facilities may occur during operation phase which will involve additional earth movement and ground clearings. These activities if not properly managed will further magnify surface runoff, increase water turbidity and sedimentation of water bodies.

The Nayom-Bayto River Irrigation System will not be affected since it is located downstream of the mining operation. The company will construct different silt traps and settling ponds along the strategic locations. These traps and ponds will effectively trap storm water runoff from areas that were already stripped for mining. Creeks that also drains storm water runoff from the surrounding areas will be constructed and equipped with a silt filter to reduce the amount of silts emptying into the creek. Areas around the creek will also be planted with grasses and other vegetative cover to increase the filter of the creek vicinity.

3.2.1 Acceptable Impacts

Mining will certainly affect the eco-system within the area. It will enhance erosion of the overlying soil during heavy rains. The removal of vegetation will certainly affect the permeability of soil resulting to erosion. Under a worst-case storm scenario, the following conditions can influence the resulting storm water runoff. These include:

- High intensity rainfall will generally produce a greater peak discharge than a rainfall that occurs over a longer time period.
- Highly porous or permeable soils that can rapidly infiltrate rainfall generally produce less runoff volume than soils with more restrictive infiltration.
- Dense vegetation such as woodland intercepts and help infiltrate rainfall, thereby reducing runoff volumes and rates.
- Conversely, impervious areas such as roadways and rooftops prevent infiltration and increase runoff volumes and rates.
- Increased slope gradients will have shorter times of concentration and will have higher peak runoff rates than those with lesser slope gradients.

Mine Site and Overburden Stockyards

One of the prominent adverse impacts on water resources resulting from mining operation is siltation especially during rainy season. Materials extracted associated with silts could easily be transported by water which could cause massive siltation when not properly addressed. Likewise, ore materials within the stockpile area could undergo potential liquefaction.

Manual Crushing and Ore Stockyard

The construction and operation of the ore stockyard will cause disturbance of the ground surface and removal of any vegetation and these direct alterations of surface runoff will affect the hydrology of the area. The construction will cause compaction of the area including the construction of the roads leading to the site. These changes may lead to increased local runoff, increased soil erosion and changes in water quality.

The impact of the construction of the facility on groundwater will be significant since the area will all be heavily compacted although localized. Water infiltration in the area will be reduced significantly and rainwater will run off directly to the canals and to the sea.

Wastes Generated by Elemental Analysis

Liquid wastes are derived from excess acids used in the elemental analyses of nickel, iron and cobalt, using Ethylenediaminetetraacetic acid (EDTA) Titration and Atomic Absorption Spectrophotometry (AAS). These wastes are classified as hazardous under RA 6969, namely:

- Sulfuric Acid
- Hydrochloric acid
- Nitric acid
- Phosphoric acid
- Hydrofluoric acid
- Perchloric acid
- Ammonium Hydroxide

Remaining chemicals will be stored in a double-walled container van to avoid direct contact of its metallic wall with the chemical vapour especially the acid vapor. The container van has concrete racks and footings directly erected from the ground so that when the van deteriorates, the whole rack assembly will not be affected. A water shower and faucet will be installed near the portal of the van to ensure water availability in case of accidental spillages. Mounted at the outside wall will be a fire hydrant. The other hydrant will be located inside the AAS room.

3.2.2 Control Strategies

Whenever possible, all water flowing from the disturbed areas will be directed into adequately-sized settling ponds or sumps with adequate silt traps and decipitors or energy breaker. Any clean runoff from areas above the disturbed areas will be directed around and away from the disturbed area via a network of diversion canals.

The settling ponds were designed taking into account its carrying capacity to handle maximum precipitation and stability. To augment silt ponds in order that clear water is discharged into natural waterways, silt dams/traps even back-up settling ponds were built on strategic areas. These silt traps/dams would contain silts not contained by siltation ponds. Also additional settling ponds will be constructed once the confirmation of additional reserves in the area will be established.

Concrete rip-rapped and open simple channels will be constructed by EMI during operation. This will include about 8.70 km and 13.0 km of road drainage canals within the vicinity and periphery of the South & North Block mining areas, with a dimension of 1.0 m at the top, 0.5 m at the bottom and a depth of 0.75 m (Fig. 3.2-1). Such structures were defined to divert runoff so as to minimize siltation and contamination at water bodies and ore stockpiles.

- North Blocks Drainage System = 8.70 km
- South Blocks Drainage System = 13.0 km

The design of the proposed settling ponds will take into account factors of stability, holding capacity, strength of foundation materials to withstand earthquake at worst intensity levels recorded in the area. Basic information on the design of the settling ponds is described as follows:

Design Parameters:

- Top of Dike = 8.0 m
- Slope ratio of dike = 1 : 2 (downstream& upstream)
- Height of dam = 8.0 meters (height of dam)

North Settling Pond
= 3.00 ha.
= 210,000 m^3 (Impounding Cap.)
= 200.00 masl (top dike elevation)
= 192.00 masl (bottom elevation)

South Settling Pond
= 3.00 ha.
= 210,000 m^3 (Impounding Cap.)
= 190.00 masl (top dike elevation)
= 182.00 masl (bottom elevation)

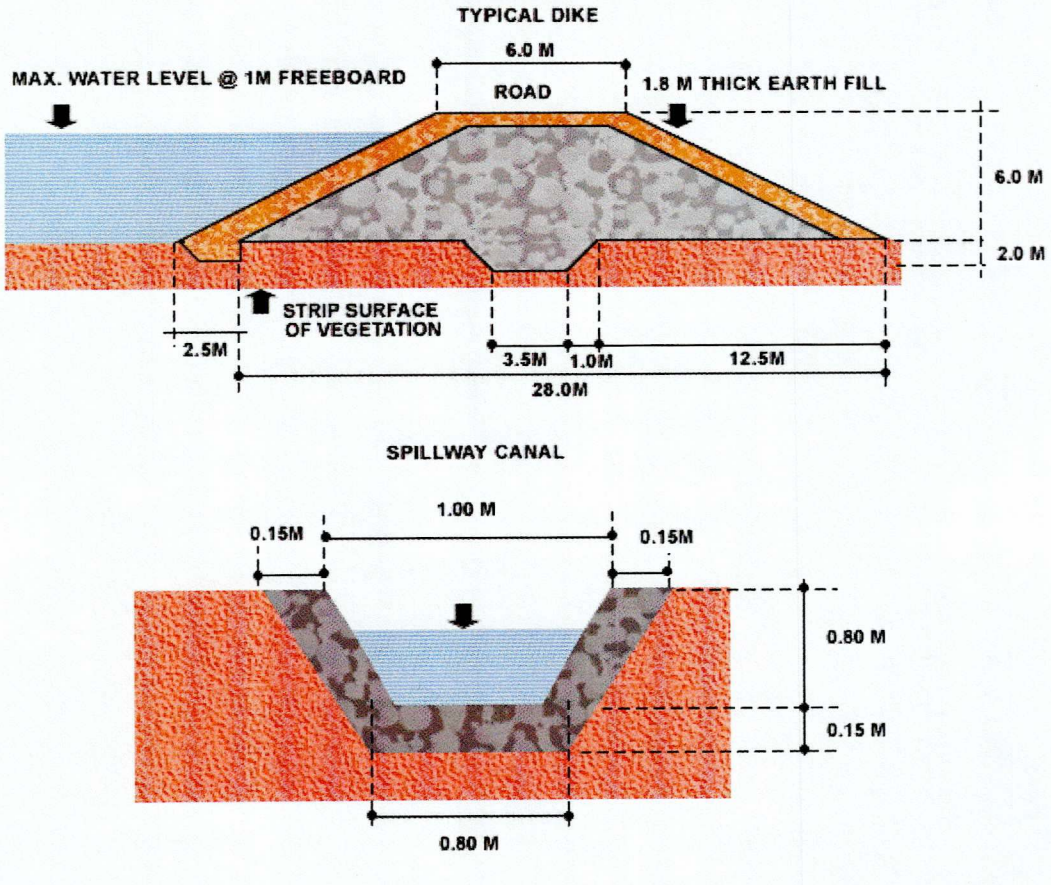


Fig 3.2-1. Design of a typical dike and spillway canal

Surface Water Runoff and Erosion Control Strategies

It is necessary to construct an appropriate pond/dam as catchment for silt and wash out soil from the surface of the laterite mining areas. This is to prevent these materials from reaching the Cabaluan River drainage system and Sta. Cruz drainage basin. If these materials could not be counter-checked by the dam, it would certainly affect the surface runoff of the river and might damage the bio-diversity within the channel. In addition, siltation of the river would also decrease the river depth, thereby decreasing its load capacity to accommodate flood waters.

Development of Waterways and Canals

This activity will involve the construction of canals/waterways in the mining claim areas. Concrete rip-rapped and open simple channels will be constructed by EMI during operation. This will include about 8.70 km and 13.0 km of road drainage canals within the vicinity and periphery of the South & North Block mining areas, with a dimension of 1.0 meter at the top and 0.5 m at the bottom and a depth of 0.75 m. Such structures were defined to divert runoff so as to minimize siltation and contamination of water bodies and ore stockpiles. Proper gradient of these canals/waterways shall be observed strictly with the construction of silt-traps before reaching the Silt Ponds.

Within the mining claim, a temporary channel shall be enhanced to accommodate storm runoff, it should be wide and deep enough to avoid soil and mine wastes erosion.

To avoid problems during heavy rainfall, ditches and canals will be constructed at the toe of the benches in the mining area. These canals and ditches will serve as catchments of fine debris and drainage in the mining area.

Benches will be graded towards the ditches and canals to catch storm water surface runoff. All of these canals will be directed towards the silt pond. Along the way downstream before reaching the silt pond, energy dissipates and surface runoff will consist mostly of rocks. Ditches will be constructed to trap also the silt and other debris.

Revegetation of Area

EMI is committed to pursue the progressive rehabilitation and revegetation of mined-out areas and areas that are deemed no longer relevant to its operation. These areas shall be revegetated with fast growing and possibly fruit-bearing trees adaptable to the area. This will be maintained and monitored using the allotted resources and personnel assigned for this project. In unstable slopes, appropriate grass species shall be introduced to prevent erosion and siltation of natural waterways.

Revegetation of areas will certainly enhance the ecological environment. It will also countercheck soil erosion in the area that would cause siltation to the downstream Cabaluan River drainage system and Sta. Cruz drainage basin.

Aside from the company's plan to progressively reforest the area, EMI shall likewise regularly: (1) clear the channel of soil, silt, and other debris; (2) remove boulders in the constricted portions of the creek; (3) include in the Information and Education Campaign (IEC) the proper disposal of solid wastes.

Runoff water from the stockyard shall go into the series of settling ponds/traps. Silt will then settle at the bottom of the ponds while the clear water at the top of the ponds at the last stage of the silting pond will be reused for water recycling. Unused stored clear water at the last tank shall be allowed to discharge into the receiving bodies of water or river system.

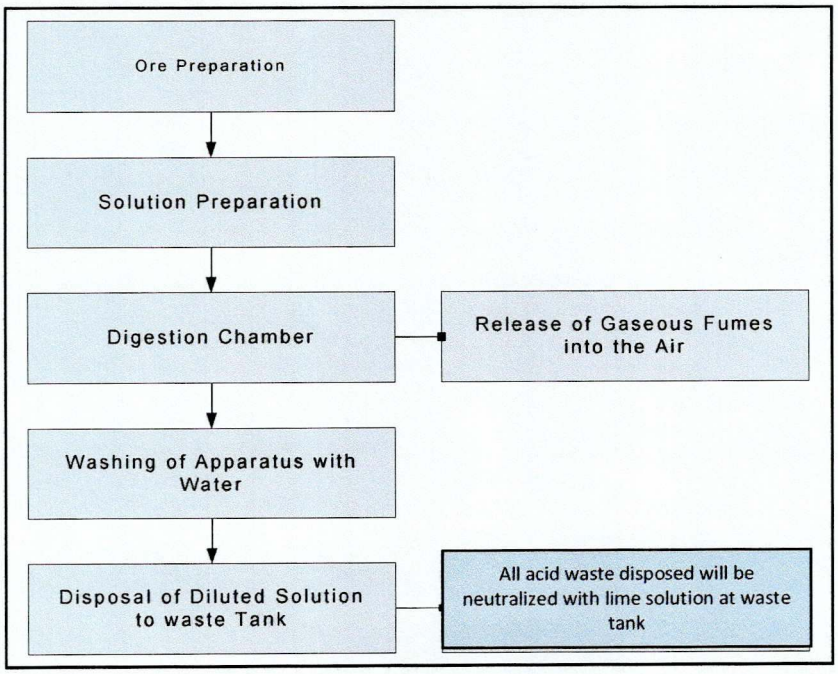
Silt materials will be regularly removed from the settling ponds using an backhoe excavator. The make-up water will be transferred to the clear water tank to reduce losses of recycled water. The sludges/silts removed from the settling ponds shall be stockpiled within the vicinity and may be used as earth filling materials for road maintenance.

Adequate drainage systems shall be provided to ensure that runoff water coming from the stockyard shall be diverted directly into the settling ponds to prevent direct discharges to river systems.

All acid wastes will be neutralized and treated with lime solution in the treatment tank to eliminate its toxicity and makes its risk-free.

The septic tank will be constructed out of concrete materials with a dimension of 3 m x 1.5 m x 2 m, with two compartments, one for liquid wastes or acid solutions and the other for solid wastes. Solid wastes, however, will be dumped in designated dumpsites in the mine site away from groundwater flow.

Process flow of waste generation is presented in the diagram below:



3.3 NOISE

3.3.1 Acceptable Impacts

The operation of electricity generating units, heavy equipment, vehicles and the manual breaking of ore to desired sizes within the mine site and pier jetty will naturally generate noise.

3.3.2 Control Strategies

- Periodic maintenance of all earth moving equipment and vehicles such as greasing, reconditioning and replacement of worn-out parts will be done. In addition, provision of a speed limit for the haul trucks at the mine site and haul road going to pier will be implemented.
- Limiting the activity hours of the pier-jetty at the time of low demand in supply. Likewise, periodic maintenance of all motors in the motor pool and plant. Furthermore, the sealing-off of all crusher motors to minimize the noise disturbance to the surrounding areas.
- Planting of trees at the perimeter fence of the plant and pier jetty along the boundary line of the premises to serve as sound barriers and to minimize the noise effect to the surrounding areas.
- Periodic maintenance of powerhouse and pump and the sealing of all motors to minimize the effect of noise disturbance.
- Provision of ear muffs to workers at the plant site who are directly affected by the noise.

3.4 AIR QUALITY

3.4.1 Acceptable Impacts

Dust Generation

Generation of dust is expected during site preparation for all the infrastructure work and operation. Specifically, this is expected to happen during the leveling, compacting of the land, extraction of the nickel ores and hauling and equipment movement. Exposure to that could lead to serious health hazard. Government standards measure the generation of dust as Total Suspended Particulates (TSP) and the allowable or acceptable concentrations for such is 300 ug/Ncm TSP for an average of 1 hour at source.

Emission from Heavy Equipment

Another source of impact on air quality are those emanating from the emission of exhaust gases coming from engines especially the diesel-powered equipment and machineries which normally run on diesel fuel, either mobile or fixed. The most prominent substances hazardous to health are Sulfur Dioxide (SO2) and Nitrogen Oxides (NOx). The allowable concentration standards at source set by the Government are 470 ug/Ncm or 0.18 ppm for SO2 and 375 ug/Ncm or 0.20 ppm for Nox.

Wastes Generated by Elemental Analysis

Gaseous wastes are derived from excess acids used in the elemental analyses of nickel, iron and cobalt analysis, using Ethylenediaminetetraacetic acid (EDTA) Titration and Atomic Absorption Spectrophotometry (AAS).

3.4.2 Control Strategies

Periodic maintenance and water spraying of all hauling routes shall be done especially during dry seasons to minimize if not totally eradicate the generation of excessive dust due to the passing of hauling trucks.

Likewise, trucks loaded with ores shall be covered with canvass or plastic to prevent dust from escaping to the atmosphere.

The regular maintenance of the haul roads and feeder roads will also reduce dust generation.

The speed of the vehicles involved in the hauling, transporting, stockpiling and loading will also be regulated according to the vehicle's specifications to minimize if not totally prevent the generation of fugitive dusts.

EMI will use articulated dump trucks equipped with scrubbers that reduce gaseous emissions to near zero levels. Additional dump trucks will be acquired in the future.

To safeguard the health of the workers in the pier, workers will be equipped with personal protective equipment such as gas masks with the right filter to prevent inhalation of airborne dusts and gaseous vehicular emissions.
Stockpiling of ore for long periods of time shall be minimized to avoid windblown fugitive dust.

Formulation and implementation a re-vegetation program along the perimeter of the causeway and conducting of regular ambient air quality monitoring shall also control excessive dust generation.

The gaseous emissions or fumes from the electricity – generating units, vehicles and equipment can be controlled through: the use of quality fuels, proper maintenance of these equipment and vehicles and proper choice of equipment and vehicles. Periodic maintenance of all engines, either fixed or mobile, heavy equipment and machineries to minimize occurrence of excessive exhaust gases coming from diesel-powered engines and conducting of regular ambient air quality monitoring shall also be implemented.

Formulation and implementation a re-vegetation program along haul and access roads and conducting of regular ambient air quality monitoring shall also control excessive emission of exhaust gases.

Gaseous fumes from the digestion chamber during sample extraction are released to the atmosphere via a chimney about 20 ft tall to be installed over the digestion chamber, where blowers and exhaust fans are also installed. The gaseous fumes will then mix with the atmosphere and will be dispersed by the prevailing wind. Monitoring of air quality in the area will be regularly conducted.

3.5 CONSERVATION VALUES

3.5.1 Acceptable Impacts

Flora Assessment

A terrestrial survey was conducted in portions of the mining claims, namely, in Block 5 and Block 7 at which sites the active quarrying will be undertaken for a period of at least twelve (12) years starting from project commencement. The sampling areas are located within the jurisdiction of Barangay Lucapon North, Sta. Cruz, Zambales with a distance of about 25 kilometers from the Poblacion when traveling via dirt roads leading to the former site of the Acoje mining area.

Generally, both Block 5 and Block 7 are characterized by secondary growth forest. Elevations range from 50 meter above sea level (masl) up to 400 masl. The area is mostly dominated by open grassland and patches of dipterocarp, molave, pine, and mossy forest. Ravines are generally dried up tributaries (intermittent) that serve as drainage to the area and leading to the main river, the Cabaluan River. Dense vegetation are mostly found along the river banks of Cabaluan River in Block 5 and tributaries in Block 7 where less acidic soil is deposited during the process of erosion. The soil is generally ultramafic-rock derived, which contains heavy metals with nickel as the most dominant mineral.

In Block 5, the overall vegetation is composed of patches of grassland with only a few number of tree species thriving in the area due to the soil condition. The soil is generally red indicating high levels of acidity and heavy metal content. The upper elevation is strewn with rocks and boulders on the upper slopes. The water and rocks observed in the Cabaluan River are reddish to brownish in color indicative of the presence of minerals such as nickel.

Block 7 is considerably larger than Block 5 and a larger portion is covered with grasses. Patches of trees were observed to be less abundant compared to Block 5. There are two bisected corridors that run perpendicularly to each other in the area. The first corridor is the main road that cuts the block from west to east and the other is the perennial creek that cuts the block from south to north and feeds into the Cabaluan River.

Fauna (Wildlife) Assessment

Field sampling was done to identify the wild vertebrate fauna in the area. The Rapid Biodiversity Appraisal (PRBA) method was used to sample the area. A modified transect walk was conducted wherein species were identified and listed using wildlife indicators such as sound and visuals, markings on the ground, fecal droppings and nesting area. Avian fauna were identified and listed as they were encountered within a 10-meter radius of the transect line. On the other hand, secondary data were obtained through various websites in relation to previous studies conducted by the Survey Team within the Municipality of Sta. Cruz and nearby communities.

Other related secondary information such as the municipal profile of Sta. Cruz, Zambales and other studies conducted within and near the project area were also included in the report especially on flora and faunal species with citation from the International Union for Conservation of Nature (IUCN), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and the DENR Administrative Order 2004-15 Establishing the List of Threatened Species and their Categories and the List of other Wildlife Species under the jurisdiction of DENR Pursuant to Republic Act No. 9147, otherwise known as the Wildlife Resources Conservation and Protection Act of 2001.

Much of the fauna observed were in Block 7 where there is water readily available to them. In Block 5, seldom did the team observe any fauna, even volant avian fauna. Birds observed in the area, mostly in Block 7 are the Black-Napped Orioles (oriolus chinensis), the Common Coucal (Centropus sinensis), Yellow vented bulbus (Pycnonotus goiaver), Zebra Dove (Geopelia striata), White Eyes (Zostrerops Montana), Quails (Turnix sylvatica), Rials (Poliolimnas cinereus), and a Forest Wagtail (Dendronanthus indicus). Some

of these bird species are endemic to the Philippines such as the White Eyes, the bulbuls, and the Coucals. Other fauna observed were the Grass Lizards. These wildlife are important to the ecosystem since they serve to distribute seeds of plants, provide nutrients through their droppings and keep pest populations under control.

Based on the secondary information, the upland forest of Sta. Cruz is abundant with mammalian species such as Philippine Warty Pig (Sus philippensis), Philippine Brown Deer (Cervus marinus), and Philippine Macaque (Macaca fascicularis). Among the reptile species that abound in the area are the Monitor Lizard (varanus Salvador) and Reticulated Python (Python reticulates). However, they were not encountered by the team during the field survey.

There were few springs/wells observed within the sampling area. However, the perennial creek bisecting Block 7 has very clear water and harbors small fish indicating that the creek never runs dry even in the dry season. However, the headwaters of the creek are found outside the block and farther into the mountains. The creek feeds the Cabaluan River.

A complete listing of Flora Species recorded within the Mining Project is shown in Annex 4.

The matter of aesthetics is relatively difficult to measure or set standards for in the absence of any official declaration by the National Museum or other institutions as to aesthetic, historical, cultural or tourism values of the claimed area. The change in land configuration, the potential cutting of trees and vegetative removal, the migration of fauna are some of the aesthetics and conservation attribution of the project.

3.5.2 Control Strategies

The rehabilitation program of EMI is divided into three schemes: (a) pre-revegetation, (b) revegetation and (c) establishment of nursery.

1. Pre-Revegetation Method

Landform design shall consider the future land use of the area in accordance with the land use program of the local government. This will be discussed further in the Decommissioning Plan to be submitted within 30 days after an ECC is issued. In terms of surface preparation before revegetation shall commence, the area shall be backfilled using overburden materials previously stockpiled for this purpose. After backfilling, the area will be graded to achieve a stable land configuration. Adequate drainage systems shall be constructed around the periphery of the area to control soil erosion and water runoff.

After backfilling and the drainage system has been constructed, stakes shall be placed to serve as marks according to the planting distance set.

2. Revegetation Method

Local species and other native species will be balled and replanted on target sites. A planting scheme of 3 m x 3 m planting distance will be applied for all tree species. This will ensure that after two years of growth, tree crowns will form a canopy and their root system will form a mesh enabling it to hold soil particles more firmly. During planting, each seedling will be simultaneously fertilized with 100 g of complete fertilizer to enhance soil fertility. Aloha trees are good windbreaks and possess a deep root system. Mangiums, known to produce a large amount of leaf litter will hasten the organic enrichment of the soil.

3. Establishment of Nursery

To supplement the reforestation program of the company, EMI will partner with local NGOs and private organizations. Species that will be used during reforestation of mined-out and bare areas include but are not limited to Agoho, Mahogany, and mangium. Food plants for birds and fruit bats will also be planted such as balite. Previous and ongoing researches by the Ecosystem Research and Development Bureau of

DENR on reforestation of mined-out areas will also be reviewed to determine the right propagation method, correct planting procedures and exact planting site to achieve a high survival rate during implementation. Fruit trees will be propagated also in the nursery that will be planted on richer ground or along the creek banks. Fruit-bearing species that may be planted are nangka, santol, mangga and other fruit trees that will thrive in lateritic soils. At a 3 m x 3 m planting distance, about 1,111 seedlings will be planted in one hectare.

3.6 HERITAGE AND CULTURAL VALUES

3.6.1 Acceptable Levels of Impact

There is no known indigenous group in the area that might be affected by the operation. In terms of assimilation of mixed cultural values brought about by the entry of hired workers, most of the local workers are nearby residents of the project.

3.6.2 Control Strategies

Considering that most of the workers will be from the nearby areas, the problem in cultural tradition and belief change is negligible.

3.7 SOCIAL ISSUES

3.7.1 Acceptable Levels of Impact

Even though the project and its existing operations has solicited approval from the affected community and even on political level, this may tend to change in the future if the present operations are not carried out properly especially in terms of the environmental issues.

3.7.2 Control Strategies

A. IEC Campaign

Information dissemination will be conducted in schools, affected communities and even in the municipal and provincial level regarding the company's operations, its program and plans for environmental protection. In addition, economic benefits especially at the barangay level which includes the establishment of community-based projects that will serve as additional source of livelihood for the affected barangay, not only in terms of job opportunities, but also in terms of civic action and sport oriented activities will be initiated. This will create an atmosphere of peaceful relationship with the affected community.

B. Implementation of Environmental Management Plan

Implementation of all aspects of a good environmental management plan shall be strictly imposed by the proponent.

C. Social Development and Management Plan (SDMP)

The submission of an SDMP to the Mines and Geosciences Bureau Regional Office No. 3 shall be undertaken by the proponent.

Annex 2 is a Matrix of the Environmental Management Plan reflecting the identified environmental impacts and the corresponding mitigating measures.

4.0 APPROACH AND SCOPE OF ENVIRONMENTAL MONITORING PROGRAM

4.1 MONITORING

Monitoring, in one way or the other, determines the success of the program and plans of the company when it comes to environmental protection and rehabilitation. It provides feedback on all programmed activities and it allows the stakeholders to organize and make some changes of its rehabilitation program. The monitoring program must include all the possible adverse impacts from the project sites to minimize environmental impacts.

4.1.1 Land and Water

4.1.1.1 Significant Impacts to be Monitored

There are significant sources of environmental impacts that the proponent intend to address, to wit:

1. Stripping of overburden and stockpiling at the overburden stockyard area.
2. Stripping of nickel laterite horizon and hauling to ore stockyard.
3. Manual breaking of ore at the stockyard.
4. Hauling of ore to the stockpile area at the causeway.
5. Operation at the causeway.
6. Laboratory analysis.

i. Parameters to be Monitored

The water quality within the project area and its periphery are in accordance with the government standards. The company will ensure that thru the plans and programs in this EPEP/FMRDP that contamination of the receiving water bodies will be avoided. Based on the environmental impact assessment of the project area, the results of the quality of the water is within the DENR standard.

1. Accelerated erosion
2. Generation of siltation in receiving bodies of water
3. Generation of fugitive dust
4. Generation of emission from heavy equipment
5. Generation of noise due to mining operation and equipment
6. Vegetation loss

ii. Purpose of Monitoring

Determine periodically the implementation of the Environmental Management Plan (EMP) and Monitoring Program by the company through the Multipartite Monitoring Team (MMT).

iii. Monitoring methods

1. Ambient Air Quality Sampling
2. Water Quality Audit
3. Noise Level Audit
4. Audit of Environmental Mitigation

iv. Monitoring locations

Please refer to Location Map of Environmental Monitoring Station.

v. Monitoring Frequency

The sampling or monitoring frequency is quarterly (i.e. four (4) times per annum). This includes sample collection and laboratory analysis.

4.1.2 Noise

Noise is technically described in terms of sound level pressure expressed in decibels (dB). Noise that will be associated with the project will be monitored based on the standards given in Table 4.1-2 and Table 4.1-3.

Table 4.1-2: Environmental quality standards for noise in general areas

Category	Type	Daytime	Morning/ Evening	Night time
AA	Within 100m from school sites, nursery schools, hospitals, and special home for the aged	50 dBA	45	40
A	Residential areas	55	50	45
B	Commercial areas	65	60	55
C	Light industrial areas	70	65	60
D	Heavy industrial areas	75	70	65
	Time	9 a.m.- 6p.m.	5 a.m.- 9 a.m.	10 p.m.-
			6 p.m.-1 0 p. m.	5 a.m.

Source: Department of Environment and Natural Resources (DENR)

Table 4.1-3: Permissible noise exposure

Duration per day	Sound Levels, Slow Response
8 hours	90 dBA
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25	115

Source: Occupational Health and Safety Center (OHSC)

i. Parameters to be measured

Since operation will only be done during daytime, noise levels will be monitored during morning and daytime. The results will be recorded in dBA in accordance with the environmental quality standards set by the DENR.

ii. Purpose of Monitoring

The purpose of noise monitoring is as follows:

a. To determine the company's compliance to the DENR Standard.
b. To determine possible improvement about the noise levels and pollution.
c. To monitor collective noise level intensity.

iii. Monitoring Methods

The objective of monitoring is to determine the intensity of noise level from the processing plant and quarry site. Methods to be applied are:

a. Use of noise meter
b. Field inspection
c. Periodic sampling

iv. Monitoring Location

Noise will be monitored in the following:

a. At the source
b. 60, 120 and 240 meters radius from the source
c. Mine site
d. causeway site

v. Monitoring Frequency

a. Monthly
b. Quarterly

4.1.3 Air Quality

i. Parameters to be measured

Air quality is normally described in terms of concentration level of various types of air pollutants over a certain area at any given time. The most common types of particulates are Total Suspended Particulate (TSP), sulfur dioxide (SO2) and nitrogen dioxide (NO2), collectively known as the "Criteria" pollutants. The limits for these criteria pollutants are set by the DENR National Ambient Air Quality Guidelines.

ii. Purpose of monitoring

The purpose of air quality monitoring includes:

a. To ensure compliance with the DENR air quality standard
b. To check the ambient air quality in the project
c. To check the efficiency of the existing air quality control devise

iii. Monitoring method

a. Gravimetric method using high volume sampler
b. Installed air quality control device

iv. Monitoring location

a. causeway site
b. Mine site
c. Haulage road
d. Main entrance gate to the project
e. Nearest residential areas

V. Monitoring frequency

Quarterly

4.1.4 Conservation Values

The activities under conservation will focus on vegetation and wildlife. Vegetation monitoring will entail the recording of vegetation due to quarrying and an annual inventory of revegetation and rehabilitation program.

i. Parameters to be measured

The parameters to be measured in conservation values include the following:

a. Changes in landform within the mine site
b. Aesthetic value of the area
c. Flora and fauna
d. Historical sites (if any)
e. Indigenous habitat of animals (if any)

ii. Purpose of monitoring

a. To know the level of acceptance of the project
b. To preserve and improve the ecological condition in the area
c. To monitor the possible changes in flora and fauna in the project
d. To preserve the historical sites (if any)
e. To conserve the animal habitat (if any)

iii. Monitoring method

a. Delineation of different landforms in the project
b. Field inspection of the area
c. Survey of flora and fauna (annual inventory)
d. Delineation of historical site (if any)
e. Identification of local animal habitat (if any)

iv. Monitoring location

a. causeway site
b. Mine site
c. Identified historical site (if any)
d. Animal habitat (if any)

v. Monitoring frequency

Quarterly

4.1.5 Heritage and Cultural Values

Even though there are no known indigenous groups in the area that might be affected by the operation, monitoring shall also be implemented.

i. Parameters to be measured

a. Migration of influx of people in the area
b. Population growth
c. Employment generation
d. Business establishment
e. Perception of the residents about the project

ii. Purpose/s of monitoring

a. Get feedback on the public perception
b. The notion of changing values of people
c. The notion of cultural adaptation of people
d. To determine the awareness of people about the current development

iii. Monitoring methods

a. Surveys / interviews
b. Observations and review of existing documents
c. Coordination with the LGU officials

iv. Monitoring locations
   a. Host barangay
   b. Adjacent barangays

v. Monitoring frequency
   a. Host barangay – biannual
   b. Adjacent barangays – annually

4.1.6 Social Issues

i. Parameters to be measured
   a. Employment generated by the project
   b. Propagation of business establishment
   c. Livelihood projects extended to host affected community
   d. Workers health and safety
   e. Illnesses/sickness in the affected community

ii. Purpose of monitoring
   a. To determine the acceptability of the operations in the barangay level and in the immediate affected communities
   b. To assess socio-economic impact of quarrying operation to host community
   c. To determine the extent of services to be extended to the host community
   d. To determine the possible effect of quarrying activities to the health of the people in the affected community

iii. Monitoring methods
   a. Surveys / interviews
   b. Observations and review of existing documents
   c. Coordination with the LGU officials

iv. Monitoring locations
   a. Host barangay
   b. Adjacent barangays

v. Monitoring frequency - biannual or annual basis

Annex 2 shows the environmental impacts and mitigating measures to be implemented by EMI. Annex 3 shows the Matrix of the Environmental Monitoring Plan representing the company's proposed monitoring plan with regard to the foreseen environmental adverse effects. The Table below summarizes the monitoring plan.

Parameter to be Monitored	Sources	Method of Monitoring	Location of Monitoring Station	Monitoring Frequency	Costs
1. Accelerated erosion 2. Generation of Siltation on receiving bodies of water 3. Generation of fugitive dust. 4. Generation of	Stripping Of Overburden and Stockpiling at the Waste Dump area Stripping of Nickel Laterite and	1. Air Quality monitoring 2. Water Quality Sampling 3. Noise Level Monitoring 4. Audit of environmental mitigation 5. Visual	Refer to Location Map of Environmental Monitoring Station	Quarterly Basis	Incorporated in the Monitoring Trust Fund (PHP150,000/ quarter)

emission from heavy equipment. 5. Generation of noise due to mining operation and equipment. 6. Vegetation loss	hauling to Ore Stockyard	inspection			
1. Generation of Siltation on receiving bodies of water 2. Generation of fugitive dust. 3. Generation of emission from heavy equipment. 4. Generation of noise due to mining operation and equipment	Manual breaking of Ore at the Beneficiation Plant Hauling of Ore to Stockpile area at the Pier-Jetty Operation of Pier-Jetty	1. Air Quality monitoring 2. Water Quality Sampling 3. Noise Level Monitoring 4. Audit of environmental mitigation 5. Visual inspection	Refer to Location Map of Environmental Monitoring Station	Quarterly Basis	Incorporated in the Monitoring Trust Fund (PHP150,000/ quarter)
1. Generation of liquid waste from acids. 2. Generation of gaseous waste from analysis.	Laboratory Analysis	1. Air Quality monitoring 2. Water Quality Sampling 3. Audit of environmental mitigation 4. Visual inspection	Refer to Location Map of Environmental Monitoring Station.	Quarterly Basis	Incorporated in the Monitoring Trust Fund (PHP150,000/ quarter)
Socio-economic effect of the project	Social Issues	Interviews with the affected community/ies	Directly affected community/ies	Quarterly Basis	Incorporated in the Monitoring Trust Fund (PHP150,000/ quarter)

5.0 RESEARCH PROPOSAL AT THE MINE

The following are the research proposal of EMI.

1. Research on the best plant species that will best thrive in the disturbed areas

   A species survival study will be conducted in mined-out areas to identify the most suitable species for revegetation. Species that will appear to survive in the laterite conditions and are drought-tolerant are mountain agoho, and mangium etc., except the Mindoro pines. These fast-growing species will be interspersed with native species to allow the survival of the latter

2. Research on reconverting idle lands into a reforestation project.

   Microbial community structure of soils in areas to be mined (overburden) and those not affected by mining will be investigated. These will study the characteristics of the soil quality and identify what various indigenous and fast growing plantation species for reforestation will be planted

3. Research on the viability of uprooting Mindoro Pine trees and transferring it to other areas and determine its effects on soil quality
4. Pitcher plant is common in laterite areas. It is present in nickel mines in the Province of Surigao, Hinatuan islands, Dinagat Islands, etc. Nevertheless, a research on the transferring and propagation of the pitcher plant will be conducted.

   Since the Mindoro pine is dominant or endemic in the area, this study will focus mainly on the probability of surviving Mindoro pine tree to non-mineable area or possible not in the lateritic soils, while the other research pertaining to pitcher plants is to find out what will be the difference between the soils from Surigao and Zambales considering that it has the same mineralogy.

6.0 TOTAL COST OF EPEP

To address the potential environmental impacts of this project, the proponent will allocate a total budget of **PHP 91,420,000.00,** representing the budget for the Environmental Protection and Enhancement Program for 12 years. On an annual basis, the Annual EPEP budget is **PHP7,618,333.33.** This exceed the allotted 3-5% of the of the direct mining costs which is estimated at PHP 156M As required by law, 10% of the total EPEP Budget automatically becomes the Rehabilitation Cash Fund or PHP 5,000,000.00, whichever is lower.

Activity	Annual Cost/Year	Total Cost PHP (12 years)
Progressive Rehabilitation/Revegetation cost	1,200,000.00	7,200,000.00
Monitoring and Maintenance cost		-
Water quality		-
Physical	100,000.00	1,200,000.00
Chemical	100,000.00	1,200,000.00
Biological	100,000.00	1,200,000.00
Air Quality		-
Dust	100,000.00	1,200,000.00
Gaseous Emission	100,000.00	1,200,000.00
Noise	100,000.00	1,200,000.00
Workers Occupational Health and Safety	250,000.00	3,000,000.00
Maintenance of Nursery	250,000.00	3,000,000.00
Watering of Haul Roads	600,000.00	7,200,000.00
Maintenance of Jetty Pier/Causeway	150,000.00	1,800,000.00
Maintenance of 35km Haul Roads	600,000.00	7,200,000.00
Maintenance of Drainage Canals and Silt traps	600,000.00	7,200,000.00
Maintenance of Drainage, Siltation Pond and Mining area	600,000.00	7,200,000.00

Maintenance of Ore Stockyard	500,000.00	6,000,000.00
Maintenance of Waste Dump/ Overburden Stockpile Area	500,000.00	6,000,000.00
Maintenance of Laboratory	300,000.00	3,600,000.00
Maintenance of Mining Equipment	500,000.00	6,000,000.00
Maintenance of Pollution Control and Monitoring Equipment	300,000.00	3,600,000.00
Research component	200,000.00	2,400,000.00
MMT Monitoring Expense	600,000.00	7,200,000.00
SUB TOTAL	**5,620,000.00**	**67,440,000.00**
	7,620,000.00	**91,420,000.00**

FINAL MINE REHABILITATION AND DECOMMISSIONING PLAN

7.0 BACKGROUND INFORMATION

7.1 Detailed History of the Mining Operation and Implications for Mine Closures

The company has not started its development/mining operation in the entire MPSA area. However, it is a fact that generally, mine closure will result to physical, social and economical impact if not programmed or planned prior to cessation of the mine operation. History will tell that once a mine ceased operating, the local communities and its surrounding environment are the ones adversely affected.

In the company's mining closure scenario, the most affected will be the local inhabitants and business establishments who would have already gained economically and considered well-off compared to neighboring towns that do not have mining operations. As far as environment is concern, a minimal implication is expected since majority of the rehabilitations are already implemented during the life of the mine. If ever there is remaining disturbed land, it is considered only a small percentage of the total area disturbed which consists mostly of mine facilities and structures which will be fully addressed during the mine closure phase.

A simple community assessment was conducted pertaining to economic activity of the local inhabitants and disclosed among others that majority of the inhabitants are not dependent in mining. Likewise, as per interview conducted, most of the inhabitants, particularly those that had been previously employed in Acoje Mine (now closed), realized that in due time, mining operation would come to an end. Hence, locals are aware of the implications once the mine operation comes to an end. Sta. Cruz town is generally an agricultural with its vast track of land planted to rice, mangoes and vegetables. Likewise, its sea is abundant with various marine animals making it a good fishing ground.

Hence, in the case of EMI, community will be able to thrive even after the life of the mining project. Additionally, it is hereby emphasized that once the project start operating, EMI through its COMREL Officer will continuously conduct community engagement such as capacity building seminars, etc. and implement projects that would further enhance their capability to have self sustaining livelihood activities.

However, for this undertaking, EMI identified impact scenarios for local inhabitants / stakeholders during closure period which as follows:

- Directly affected are the employed population due to loss of income from employment in the mines;
- Lower business activities in the locality and neighboring towns;
- Closure of several business establishments that have opened up during the mining period;
- Out-migration of skilled laborers and professionals that were employed in the mine;
- Decrease and/or Loss of Taxes for local and national government, including taxes paid by employees;
- Termination/Loss of budget allocation for company and government initiated programs such as SDMP, Annual EPEP and other community development assistance projects.

7.2 Objectives of Mine Closure and How These Relates to the Mine and Its Environmental and Social Setting.

For a company like EMI whose main objective is to partake in the government's thrust of revitalizing the mining industry thru mineral sustainable development, it is our company's responsibility to adopt what the law mandates pertaining to aspect of mine closure as a final phase in the concept of mine development.

Objectives of Mine Closures

The company's objectives of mine closure are the following:

1. To have the abandoned/mined-out areas conducive for the vigorous growth of fast growing forest trees and other vegetation suited in the area;

2. To serve as a model in the environmental protection by ensuring harmony with other components of the natural environment in the area;
3. Minimize areas of disturbance during the construction and operational phases;
4. Conduct ongoing studies which will enable best environmental and rehabilitation practice techniques to be developed and implemented when carrying progressive rehabilitation;
5. To leave a legacy that, after mine closure, other sources of livelihood could evolve in the area through implementation of sustainable social development program; and,
6. To comply with all legal requirements.

The said objectives will be attained thru the following:

1. Establishment, as early in the life of the Project, of the final land use which would be a stable re-vegetated mined-out area;
2. Regular consultation with the stakeholders thru continuous conduct of IEC;
3. Establishment of success indicators for closure;
4. Periodic review of the FMR/DP;

   The company will initiate the review of the FMR/DP every two years thereafter from the date of approval. This review may be moved up if changes in mining activities or in the rehabilitation measures chosen justify modifying the plan either at the company's request or if the MGB deems it to be necessary.

5. Conduct of an independent technical review. The company will encourage the conduct of an independent technical review and audit of the entire mine development, operation and closure process. Key focus areas of the mine closure will include, among others:

   - The adequacy of plans for closure;
   - The appraising of success and compliance to the conditions of closure;
   - The adequacy of success indicators; and
   - The identification of residual commitments and planning how to deal with them.

6. Preparation for residual care. During the periodic review of the FMR/DP and at the end of its implementation, the company commits to implement residual care that may be needed/identified in some cases/instances;
7. Building local capacity and avoiding creating a culture of dependency. The company will implement livelihood trainings to prepare the community to become self sustaining after the life of the Project; and,
8. Facilitation of the participation of other development players. The company will still consult with other developmental players like the NGOs and community-based organizations in the area in the planning and implementation of the FMR/DP.

In this regard, EMI will pursue the following objectives of the mine closure:

- **Constant consultation with various stakeholders**

In the formulation of closure criteria to demonstrate the success of rehabilitation, concerned stakeholders which include the regulators and the local community, plays an important role such as in the establishment of the criteria and monitoring methods to asses the performance. Concerns of involving the community is important particularly if a particular components of the closed mine site are to be utilized by the local community. Likewise, EMI is aware that in mine closure, success depends on the standards to be adopted and it is a matter of agreeing with the community and regulators what set of standards to be accepted at present day mine site closure and whether such standards will still be acceptable at some time in the future.

- **Determination and establishment of the project's final land use**

Involving the communities in mine life planning is one of the primary objectives of EMI in order to help make key decisions on long term land use issues. In all of the community consultations conducted by EMI, inputs from stakeholders will be used to help determine the best future use options for different domains on the whole mining area. This process could carry out the necessary earthworks, establish the right trees, shrubs and grasses and everything required to transform the mine closure plan into reality.

- **Promotion of self sustaining livelihood program and capacity building for local community**

Although it is a fact that majority of the local communities are not dependent on mining, it is however the obligation and responsibility of EMI to help the community find a self sustaining livelihood activities once the mine closed. This way, the expected mine closure scenario will turn the situation into something that is positive and has the support of the community. At this early stage of mine closure planning, the company believes that it is harder for local people to contemplate the day when the mine, which may have been the mainstay of the local economy, will no longer be there.

7.3 Results and Lessons Learned from Completed Progressive Rehabilitation

EMI has not yet started mining development and could not present results or lessons learned from the progressive rehabilitation activities. However, based on observations from other mining companies that are already implementing progressive rehabilitation, the best practice is to prepare the area immediately after mining out the ore by stabilization, top soiling and revegetation. These activities are all incorporated in the EMI's EPEP.

8.0 STAKEHOLDERS INVOLVEMENT

The proposed program for final mine rehabilitation and decommissioning was presented to the Barangay officials of the host barangays and other stakeholders in the form of an Information and Education Campaign (IEC) seminar. The said IEC was also attended by the company's administrative officer and the technical personnel. The IEC was conducted within the barangay that has jurisdiction over the company's MPSA. These are Brgy. Lucapon South, Brgy. Tubo-Tubo South, Brgy. Tubo-Tubo North, Brgy. Guis-Guis, Brgy. Guinabon, Brgy. Uacon.

Highlights of the discussion and the major concerns of the stakeholders are presented in Annex 4 and the table below:

Stakeholders / Date of Meeting/ Dialogue	Highlights of Discussion/Concerns/Issues
CENRO, Masinloc / November 7, 2007	The meeting was conducted at the Office of CENRO – Masinloc, Zambales and was attended by DENR personnel from Forestry Sector, DENR Region 3. The main concern of the DENR Technical personnel was the main tree specie to be used in the rehabilitation of mined out areas. It was recommended that Mindoro Pines should be the primary specie to be utilized in the tree planting activity particularly in the upper elevation (around 300 masl and up). Likewise, it was also recommended that seedling nursery must be put up in the area particularly within the locality where Mindoro Pines thrives well.
Municipal Council of Sta. Cruz, Zambales / November 14, 2007	The session was conducted at the Session Hall of Brgy. Poblacion South and was attended by majority of the members of Sangguniang Bayan of Sta. Cruz. The main concerns of the local officials were the implementation of the corporate social responsibility even during the closure period to address socio-economic problems of their constituents that will be directly affected by the cessation of the operation. This is in addition to the timely and proper implementation of rehabilitation activities in the mine affected

	areas.
Teachers of Lucapon South Elementary School / December 12, 2007	Dialogue was conducted at the Principal's Office in Lucapon South Elementary School and was participated by teachers and selected students. Accordingly, the group's concern is for the company to prioritize the restoration of the mine affected areas and after the life of the project, the company should not neglect its obligation to reforest the mine sites. They prefer reforestation program in the mountainous areas of the company's mineral property.
Brgy. Council of Uacon, Candelaria, Zambales	The meeting was held at the session hall of Brgy. Uacon and attended by majority of the members of the Sangguniang Barangay. The main concern of the council was the guarantee in performing the obligation of the company in rehabilitating mined out areas after the life of the project. It was also suggested that the barangay constituents should be given priority in the reforestation activities if to be contracted. They prefer reforestation in the upland and agricultural in the low land.
Brgy. Council of Lucapon South, Sta. Cruz, Zambales / January 6, 2008	The meeting was conducted at the session hall of Brgy. Lucapon South and participated by majority of the brgy. council. Major concern of the council is the reforestation of the mine affected areas while the area being occupied by ISF beneficiaries should be developed into a vegetable plantation – the original used of the land prior to mining development. Likewise, they requested that haulage road or mine road and other mine structures be donated to the barangay.
Brgy. Council of Tubo-Tubo South, Sta. Cruz, Zambales /March 17, 2008	The meeting was conducted at Brgy. Hall of Tubo-Tubo South and attended by majority of the members of the Brgy. Council. It was requested by the council that prior to the closure of the mine, constant consultation be made so that they will be aware of the plans and programs of the company regarding the benefits of their constituents who will be terminated from the employment. It was raised also that the cooperative in their barangay is willing to participate in the reforestation project of the company during the mine closure phase. It was also requested that if possible, service vehicle be donated to them after the life of the project.
Brgy. Council of Guis-Guis, Sta. Cruz, Zambales / April 12, 2008	The meeting was conducted at the session hall of Brgy. Guis-Guis and majority of the brgy. council were present. Main concerns are environmental protection of the source of water at So. Ingmalpay and the construction of farm to market road. In case the farm to market road shall be used by the company as mine road, they requested that after the life of the project, it will be donated to the barangay for their constituents used.
Brgy. Council of Guinabon, Sta. Cruz, Zambales	The meeting was conducted at Brgy. Guinabon brgy. hall and was attended by majority of the brgy. Council. Focused of the discussion on issue of final mine rehabilitation and decommissioning plan were the benefits of the laborers who will be affected by the closure of the mine and the transformation of the mined out areas into a productive post land use such as fruit tree plantation, enhancement of forest tree plantation area and development of watershed for source of water for irrigation and domestic use. It was also emphasized that there should be a continuous dialogue and consultation prior to mine closure between the company and the local people thru the Barangay Officials.
Brgy. Tubo-Tubo North, Sta. Cruz, Zambales	Main concern of the local officials of Tubo-Tubo North is the preservation of the downstream water which is being used as irrigation for rice and vegetable plantation. The council requested that they should be given regular updates of the companies operation and the environmental protection measures and activities in their area of jurisdiction.

9.0 RISK ASSESSMENT

9.1 Identification of source of risk

In the implementation of the activities of the FMRDP several risk attendant to the final rehabilitation and decommissioning activities were identified. However, the effect will not be significant and is concentrated within the area of operation such as the active mine area, the ore stockyard and causeway area and the assay laboratory area.

On the other hand, a simple risk assessment of the condition of the operation during decommissioning, its structures and the manner of the implementation of decommissioning activities shall be undertaken to determine the possible risk management activities to be formulated during and after the rehabilitation and decommissioning activities as far as biological and physical environment is concerned.

The risk assessment will deal with both evaluation and management of risks. The evaluation phase addresses three questions (Kaplan and Garrick, 1981):

1. What can go wrong with the project?
2. What is the range of magnitude of these adverse consequences?
3. How likely are these adverse consequences?

However, more often there is the difficulty in applying the risk assessment approaches considering the complexities of the activities of mine rehabilitation and decommissioning activities. Hence, a simplified methodology being adopted by T.P. Farrel of Woodward Clyde will be implemented. Some modifications on the methodology will be done to fit in local conditions in the project site. The steps in this approach will be:

1. Analyze potential failure at the site
2. Assess the release scenarios
3. Evaluate the potential environmental and safety impact resulting from the release
4. Evaluate the risk
5. Manage the risk to ensure they are minimized or acceptable.

The management phase evaluates the alternative risk reduction measures and how to deal with the risk in case of occurrences or known as the emergency or contingency plan. In the mine closure phase, the risk assessment will consider the hazards regarding environment, safety and social.

The identified hazard during FMRDP activities for this project can be categorized into following groups:

1. Risk during Rehabilitation of the Mined Out Areas
2. Risk during Rehabilitation and Decommissioning of Areas of Mine Support Facilities and Structures

9.1.1 Environment

i. Risk during Rehabilitation of the Mined Out Areas

   a. Sedimentation of water courses as a result of erosion of waste dumps and barren soil surface;
   b. Physical disturbance of the environment as a result of inadequate rehabilitation measures;
   c. Landslide and slope failure

Laterites are major source of silt during rehabilitation activities if there are not enough catchment ponds or silt sumps provided in the mine site.

The risk of sedimentation of water courses can be minimized by maintaining adequate drainage and silt catchment ponds within areas undergoing rehabilitation activities.

Likewise, inadequate measures or poor implementation of rehabilitation activities such as absence of siltation control measures and insufficient technical capabilities of personnel in-charge of rehabilitation activities will further increase risk of cascading events that would result to failure of rehabilitation.

Slumping and slope failure may occur along road cuts and mine bench during rainy season and in areas where there is geologic structures or due to inappropriate working procedures.

EMI will address such foreseen events in order to minimize or lessen risks by properly maintaining adequate drainage canals and silt sump/ponds. In addition, EMI management will provide full support to the rehabilitation team to attain the desired goal and rehabilitation objective.

ii. Risk during Rehabilitation and Decommissioning of Areas of Mine Support Facilities and Structures

a. Release of poor quality of water from settling ponds;
b. Water and land contamination from hydrocarbon spills;

Release of silt-laden water may occur during decommissioning of the pond for failure of communication and coordination among rehabilitation personnel. It may also occur due to accidental improper decommissioning procedures or method or lack of technical knowledge in dealing with decommissioning a settling pond.

The settling ponds will be retained during rehabilitation period and years after rehabilitation was done. As expected, erosion and siltation are main concern during FMRDP stage and silt ponds and drainage canals will accommodate silt laden water to lessen the impact to water ways. Hence, rehabilitation personnel shall be informed of this plan in order to avert accidental release of poor water quality from settling ponds.

Decommissioning of fuel depot and motor shops facility might trigger accidental spill of diesel fuel and used oil storage containers if the work procedure are not proper implemented. In order to prevent such occurrences, EMI will hire a contractor who is experts in decommissioning hydrocarbon storage facilities.

Sources of Risks - **Environment**

The Risk	What & How It Can Happen	The Consequences of An Event Happening	Existing/proposed Controls	Consequences Rating	Likelihood Rating Considering Controls	Level of Risk
Increase in disturbed area for rehabilitation under the FMR/DP	Non-conformance to progressive rehabilitation and poor maintenance of rehabilitated areas	Increase cost for rehabilitation	Implementation of the EPEP. Conduct of progressive rehabilitation and maintenance of rehabilitated areas	3	E	M
Excessive dust generation	It can be wind generated dust	Dust will significantly impact the visual amenity, safety of personnel and smothering of vegetation.	Setting of speed limits and periodic road spraying. Covering of truck loads for long range hauling	2	C	M
Water pollution	Cleared and open areas are prone to erosion that will cause siltation	Siltation of nearby water bodies	Maintenance of drainage system and siltation ponds and silt traps	2	C	M
Stop operation due to	Catastrophic events like typhoon, earthquake, etc.	Stoppage of operation	Emergency response program	3	E	M

natural calamities						
Failure of the FMR/DP	Lack of management support (operational and financial)	Incomplete and meager rehabilitation of the affected areas	Funding and technical mechanism provided under by the FMR/DP and the FMR/DF	3	E	M
Noise pollution	Excessive noise associated with decommissioning of vehicles and equipment	Disturbance to nearby communities	No blowing of horns in crowded areas (schools, community, etc). periodic maintenance of vehicles and equipment. Use of PPEs by personnel	2	C	L
Failure of pollution control devices (silt ponds)	Poor maintenance	Siltation of nearby water bodies	Maintenance of silt ponds and drainage system	2	D	L

9.1.2 Safety

i. Risk During Rehabilitation of Mined Out Areas

Mined out areas will be rehabilitated by a combination of top-soiling (backfilling of top soil) and leveling (landscaping). The only hazard identified during these activities is the risks of rehabilitation workers of being struck or pinned by equipment operators and haul truck drivers.

To avoid this type of hazard, only responsible and highly trained operators and truck drivers shall be selected. Likewise, concerned personnel shall be required to undergo in-house safety training seminar.

ii. Risk During Rehabilitation and Decommissioning of Areas of Mine Support Facilities and Structures

The same hazard as above are expected during rehabilitation and decommissioning stage for this type of facilities.

Other hazards associated with decommissioning are identified as follows:

AIR POLLUTANTS

The air pollutants from earthmoving and hauling activities include dust, carbon monoxide and carbon dioxide. Like any other form of air pollutants, these substances can damage human health if absorbed beyond threshold limit. The health effects associated with air pollution may be pulmonary or systemic. Pulmonary injury occurs when inhalation of a chemical injures the lungs. Systemic effects result when the chemical present in the lungs is subsequently carried by the blood and affects any organ. Gases are readily absorbed into the lungs. Dusts or particulate matters usually reach the lungs when they are 1 to 10 microns in diameter. CO2 which is one of the greenhouse gases is known to contribute to global warming while CO is poisonous to all warm blooded animals and to many forms of life.

During decommissioning and rehabilitation, there is heavy reliance on heavy equipment to transport soil overburden materials from the waste dumpsite area to the mined out area thus there is considerable volume of respiratory dust and gases produced. Dust emanation in laterite areas due to passage of haul trucks is observed to be dominant particularly during dry season.

HIGHLY FLAMMABLE MATERIALS (DIESEL FUEL)

Diesel is a heavy residual oil extracted from distillation of crude oil. Its volatility is similar to that of gas oil. With a flash point of 38 to 93 deg C, it weighs about the same as water but is insoluble in water. Its calorific value is 18,590.66 BTU/lb. It contains some impurities notably sulfur, in the range of 1.5 to 3.0 by weight.

CO is emitted during uncontrollable events at the rate of 10.8 kg/1000 liter of fuel burned. It is a fire hazard. In case of fire, the maximum effect distance is calculated in terms of thermal heat radiated from the particular incident. In the case of spill or leak, the oil can contaminate the soil and eventually the groundwater which can possibly create negative social perception against the company.

During the life of the project, part of the mine support structures is the diesel fuel storage tanks with a range capacity of 20,000 liters to 40,000 liters. During dismantling of the tanks, the possibility of gas explosion is not remote particularly when the job is to be done by un-experienced laborers.

NOISE POLLUTION

This is also major concern even though the source and the receptor can be immediately separated or isolated in case of high readings of noise level and the exposure can be reduce depending on the level of noise.

However, in a study conducted by WHO, long term exposure to excessive noise causes the premature death from heart disease of thousands of people worldwide. "The new data provide the link showing there are earlier deaths because of noise. Until now, noise has been the Cinderella form of pollution and people haven't been aware that it has an impact on their health."

The noise threshold for cardiovascular problems is chronic night-time exposure of 50 decibels or above. Living with noise pollution may be more stressful for some people and it can lead to heart failure, strokes, and high blood pressure and immune problems.

Noise pollution is present in every stage of mining operation and it is also prevalent during decommissioning and rehabilitation stage where the activities are heavily reliance on equipment utilization. In the activities of rehabilitation and decommissioning, exposure to excessive noise emanating from heavy equipment such as dozer, backhoe and concrete rock breakers are equipment operators and helpers or spotters. Noise emanated from earthmoving equipments ranges from 80 dB to 110 dB. Regulatory requirement from Department of Labor and Employment (DOLE) is that for a noise excessive of 90 dB, receptor must not be exposed for a duration of 8 hours, otherwise, receptor must wear PPE.

Sources of Risks – **Safety**

The Risk	What & How It Can Happen	The Consequences of An Event Happening	Existing/proposed Controls	Consequences Rating	Likelihood Rating Considering Controls	Level of Risk
Falls from benches	Non-observance of safety precautions, unsafe acts/conditions	Body injury or death	Implementation of the Safety and Health Program (SHP), conduct of relevant safety trainings and seminars. Daily safety briefing (PEP talks)	5	E	H
Hit by falling rocks from upper benches/slides	Unstable slopes, Non-observance of safety precautions, unsafe acts/conditions, no PPE	Body injury or death	Implementation of the SHP, conduct of safety trainings and seminars. Putting safety signage. Use of PPEs. Daily safety briefing	5	E	H
Trips and slips	Non-observance of safety precautions, unsafe acts/conditions	Body injury/muscular stress	Implementation of the SHP, conduct of safety trainings and seminars. Putting safety signage. Use of PPEs. Daily safety briefing	2	D	L
Dust exposure	Lack of PPE	Shortness of breath, respiratory illness, eye injury	Implementation of the SHP, conduct of safety trainings and seminars. Putting safety signage. Use of PPEs. Daily safety briefing	2	D	L

Noise	Exposure to high level of noise	Hearing impairment	Implementation of the SHP, conduct of safety trainings and seminars. Putting safety signage. Use of PPEs. Daily safety briefing	3	D	M
Bump by moving equipment	Unsafe acts, unsafe condition, lack of training	Body injury, death	Implementation of the SHP, conduct of safety trainings and seminars. Putting safety signage. Use of PPEs. Daily safety briefing	5	E	H
Caught between moving parts	Caught by moving equipment	Body injuries	Implementation of the SHP, conduct of safety trainings and seminars. Putting safety signage. Use of PPEs. Daily safety briefing	4	D	H
Vehicular accidents	Reckless driving, poor maintenance of vehicle, lack of safety warning devices	Body injury, death	Implementation of the SHP, conduct of safety trainings and seminars. Putting safety signage. Use of PPEs. Daily safety briefing. Only authorized persons will be allowed to drive.	5	E	H

9.1.3 Social

The town of Sta. Cruz, Zambales is well known for its vast reserve of commercial deposit of nickel and due to good nickel prices in the market, the EMI areas are susceptible to entry of illegal miners. Not only nickel is delineated in the area but also some laterite deposits are mixed with chromite sand at the upper layer and vein type chromite at deeper section which were vulnerable from being illegally mined due to proliferation of several buying station in northern part of Zambales. This is the major risk foreseen by the company since not all the MPSA areas will be mined by EMI.

Areas that are likely to be targeted by illegal miners are buffer zones of rivers and roads and the Company-LGU initiated watershed areas. Watersheds which are Company-LGU initiated are not declared by national government but it has been mutually agreed by the company and LGU to preserve the water source of a particular area for domestic and irrigation use.

The above risk will be addressed by EMI by retaining some of its security forces and deploying them in areas that are likely to be potential targets of illegal miners. Likewise, coordination with local police and LGUs and continuous IEC with the community will be conducted by EMI as regards the matter and the implication of illegal mining operation in areas mentioned above.

Sources of Risks - Social

The Risk	What & How It Can Happen	The Consequences of An Event Happening	Existing/proposed Controls	Consequences Rating	Likelihood Rating Considering Controls	Level of Risk
Increase of a Ceased and Desist-Order (CDO)	Stoppage of the decommissioning and rehabilitation due to non-compliance with regulatory requirement	Stoppage of the decommissioning and rehabilitation works. Penalties. Filing of court cases (criminal and damage suits)	Implementation of the approved FMR/DP and compliance to government regulations	5	E	H
Increase in anti-project sentiments	Unpopularity of the decommissioning and rehabilitation due to poor	Can lead to barricades, rallies, delays in the	Implementation of the SDMP during operations. Harmonized relationship with the host community. IEC campaign	3	E	M

	Project-Host Community relationship	decommissioning and rehabilitation				
Strained relationship with the LGUs	Unpopularity of the decommissioning and rehabilitation due to poor Project-LGU relationship	Can lead to barricades, rallies, delays in the decommissioning and rehabilitation	Implementation of the SDMP during operations and the approved FMR/DP. Harmonized relationship with the LGUs. IEC campaign	3	E	M
Stop operation due to security problems (terrorist acts, communist, etc.)	Terrorist/communist attacks	Stoppage of the implementation of the FMR/DP	Close coordination with the PNP. Harmonized relationship with the host community	3	E	M
Peace and order problems due to temporary closure	The loss of income for the residents due to the closure of the project can lead to peace and order problems	Increase in crime rate, pilferage, theft of company properties, vandalism	Implementation of the SDMP during operations. Conduct of IEC to improve relationship with the host community	3	E	M
Care and maintenance status of operations due to low market demand	Low cement price will cause the care and maintenance of the Project	Stoppage of operation	Dialogue with stakeholders. Conduct of IEC	3	E	M
Failure of the host community to progress as a whole, after the closure of the project	The loss of income for the residents due to the closure of the project can lead to slow down of economic activities for the community	Migration	Successful implementation of the SDMP establishing alternative livelihood projects. Dialogue with stakeholders. Conduct of IEC	3	E	M

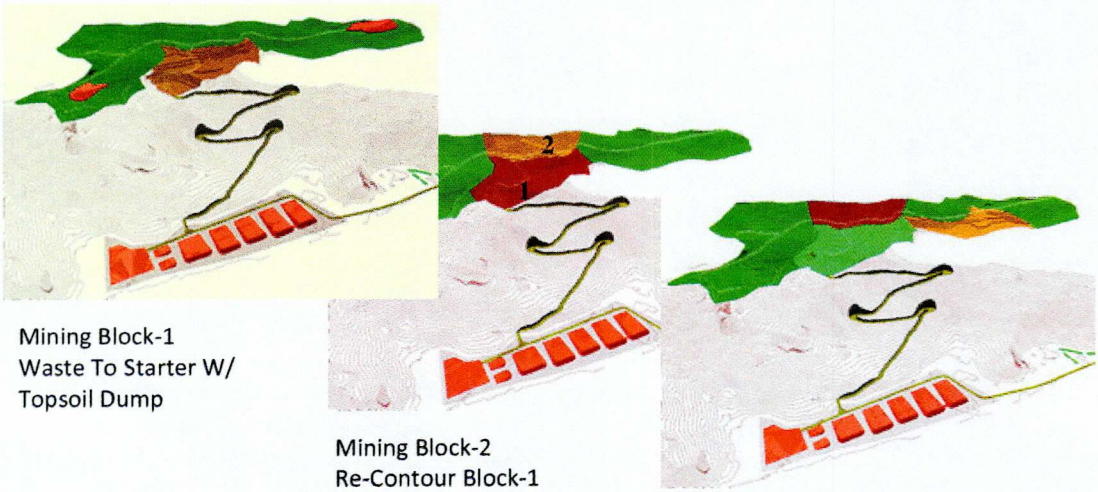
9.2 Summary of Mine Closure and Rehabilitation Scenarios, Uncertainties and Assumptions

The area covered by the MPSA of EMI is 4,619 hectares, more or less and consisting of nine (9) blocks. However, the area covered by the ECC of the mining project is block 5 and 7 of subject MPSA covering a total area of 3,846.43 hectares. The EPEP and the FMRDP will limit its discussion and presentation in the said blocks, being the area applied by the company in the partial declaration of mining feasibility (PDMF).

Initially, the approximate life of the project is estimated at 12 years, based on the present resource estimate and assuming nickel price in the world market will not slump too much.

The mined out area will be progressively rehabilitated as mining advances. It will be done by opening an area block by block and then rehabilitating by backfilling, re-contouring and stabilization and revegetation one block after the other (please see attached mine plan and progressive rehabilitation maps). Progressive rehabilitation activities shall be done by the company's mine environmental and protection team immediately after a certain block has been declared mined out by the mine operation group. For Block 5,

the approximate area to be disturbed by the mining operation is 50.0 hectares while in Block 7 it is assumed that the disturbed area is 70.0 hectares for a total of 120.0 hectares.



Mining Block-1
Waste To Starter W/
Topsoil Dump

Mining Block-2
Re-Contour Block-1

Mining Block-3
Re-Contour Block-2
Revegetate Block-1

By the end of the mine life, it is assumed that 85% of the mined-out area (or 102 ha.) has already been rehabilitated during the EPEP period of implementation. Hence, majority of the cost of rehabilitation of the mined-out areas will be incurred during the life of the project or before the implementation of the closure plan (FMRDP). Doing rehabilitation progressively is advantageous to the company as far as economic is concern as it will redound to minimal rehabilitation at closure period and security deposit can be maintained at low level considering that only the remaining areas during the final years of operation shall due for rehabilitation activities. The remaining mined out areas due for rehabilitation in the closure phase is about 20.81 hectares. In addition to this area is the rehabilitation of mine environmental /support facilities such as settling ponds & ore stockyard areas, etc. which has an area of about 43.3 hectares for a total of 64.11 hectares.

Pit Number	Reserve	Life	Year to be Rehabilitated
Block 5	3,499,824 DMT	12	After the life of the mine
Block 7	4,285,449 DMT		

9.2.1 Planned Closure

Mine closure of this type is when a mining operation cease based on forecasted life of the mine or when the ore reserve is already exhausted. In this closure scenario, FMRDP that has been programmed and approved by proper government authority will be implemented as planned.

9.2.2 Temporary Closure

This type of closure is a planned action of the management due to economic and/or operational constraints such as lack luster market condition and low prices of nickel ore, etc. If this is the scenario, the EMI will adopt a Care and Maintenance Program (CMP). However, options for reopening the mine in the future will be the primary considerations.

The CMP will include programs such as maintenance of mine facilities and structures and monitoring. This will also include maintenance of existing and on-going environmental and SDMP programs. On the other hand, should the existing operational constraints worsen and opening become uneconomical, the FMRDP will be implemented.

9.2.3 Sudden or Unplanned Closure

The untimely closure of the mine can be attributed to financial constraints and other economic reasons such as low metal price as against high mining operation costs, etc. Sudden closure may occur due to regulatory enforcements in violation of laws, rules and regulations and it is impose by government regulatory agencies.

The untimely closure will be managed by the company by the following strategies:

- Implementation of Care and Maintenance during the closure period.
- Immediate preparation of plans for Final Mine Rehabilitation and Decommissioning
- Immediate compliance to the reportorial requirements being required by Government regulatory agency/s in order to lift the temporary closure / suspension of the operation
- Conduct of dialogue with stakeholders to resolve the issues and to keep them aware of the status of the mine operation and the reason behind temporary closure

The project components that will be maintained and monitored are the following:

1. Mining area – active area and the haul roads
2. Support facilities of the project – the administration building; motor pool area; guard houses; settling ponds, check and filter dams, stockpile areas and nursery.

The CMP will contain of the following considerations:

1. Notification of stakeholders (employees, LGUs, government agencies and contractors) prior to the starting date of Temporary Closure.
2. The company personnel department will implement appropriate measures for non-essential personnel (notification, possible consumption of remaining leaves, separation pay, etc.)
3. EMI will refer the laid-off non-essential personnel to other projects, if any.
4. When the projects re-opens, qualified laid-off workers will be given preference in hiring.
5. All contractors will be required to secure their designated facilities subject to inspection and clearance from EMI.
6. Mining operations will be temporarily stopped.
7. A general hazard assessment of project areas will be implemented prior to cessation of operations. Corresponding mitigation measure will be implemented.
8. All working/active benches will be stabilized prior to cessation of operations.
9. Drainage system will be checked and maintained periodically to ensure that the natural flow of surface run-off will not be obstructed and drains towards siltation dams.
10. All mining equipment will be positioned in designated parking areas or in the motor pool area.
11. Essential roads will be maintained.
12. All support operations that are necessary for the protection and enhancement of the environment will be maintained.
13. A team composed of heavy equipment operators will be on standby in case their services are required during emergency situations.
14. Adequate security will provided. Only essential personnel will have access to the project area.

10.0 FINAL MINE REHABILITATION AND/OR DECOMMISSIONING PLAN

10.1 Final land use of the site and for each identified mine component.

Component of the Mine / Mine Facilities and Structures

- Settling Ponds at Mine site
- Motorpool area
- Generator set and fuel depot area
- Administration Building
- Company Staff House and Facilities
- Mined out areas
- Settling Ponds and Ore Stockpile Area
- Pier/Causeway

The final land use of the project area is a leveled and stabilized surface ready for tree planting. Species such as Mindoro Pine trees shall be planted at elevation 500 masl and up while other areas shall be vegetated with appropriate tree species such as jathropa and mahogany. At 3 m x 3 m plant spacing, the number of seedlings needed for block 7 is 125,198 while for block 5, it is 167,385 pieces. Table 3-1-1 in Section 3.0 of EPEP discussion shows the estimated disturbed areas or the mine pit and the approximate number of seedlings needed to revegetate the areas.

All facilities at the mine site and ore stockpile area shall be retained and use as administration office and storage facilities during the five year period of decommissioning stage. The company shall have the option to donate the building to the Barangay if necessary and upon request by the local government.

No technological advances were considered in the formulation of the FMR/DP. In case there will be any that will help in the successful implementation of the FMR/DP, EMI will avail of such technical advances. At the moment, there are no identified unique circumstances that may affect the implementation of the FMR/DP.

The criteria in choosing the final land use are based on the following:

i. Attributes of the present landscape and the existing most populated vegetation prior to mining development.
ii. Naturally occurring hazards in the area and the location of the mined affected area. It should be emphasized however that there are no major occurrences of natural hazard in the locality such as major faults. The area is stable and revegetation of the mined out area after the life of the mine is the ideal option.
iii. Recommendation of the DENR – Forestry Sector, Region 3 to propagate endemic species for use as planting stock in the mine rehabilitation activities.
iv. Clamor of the Sta. Cruz LGU and Rotary Club for massive reforestation of the upland using Mindoro Pines as the main specie.

Table 6-1 Final Land Use for each Project Component

Project Component	Final land Use	Area after Mine life of 12 years
Mining Area		
Mining Area : Slopes Pit Floor	Stabilized Slopes Leveled Area and Tree plantation for various species of endemic and non-endemic tree species	120.0 hectares

Mine Support Facilities		
Mine roads including in-pit road and existing Acoje Road	Well maintained roads	21.70 km. – in pit 14.0 – Acoje Rd. (0.0214 ha.)
Run of Mine Pad : North Ore Stockyard South Ore Stockyard	Leveled surface with stabilize slopes and tree plantation sites for various tree species	26.0 ha.
Office buildings	Office for the care and maintenance of tree plantation sites	0.25 ha.
Motorpool / Mechanical / Electrical Shop	Motorpool	0. 25 ha..
Guard Houses	Will be improved for use as Monitoring Station	0.01 ha.
Hardstand and Parking Areas	Leveled surface and tree plantation areas	0.10 ha.
Contractor Areas	Leveled surface and tree plantation areas	0.20 ha.
Bunkhouses and Recreational Facilities	Well maintained facilities for donation to LGU	0.03 ha.
Causeway	Will be improved and maintained for donation to LGU	0.30 ha.
Pier Ore Stockyard	Leveled surface in preparation for residential / commercial development	5.0 ha.
North and South Waste Dump Area	Leveled surface and tree plantation areas	11.0 ha.
Sample preparation and Assay Laboratory	Leveled surface	0.15 ha.
	Sub-total for Mine Facilities Area	43.31 ha.
Mine Environmental Protection Structures (MEPS)		
Settling Ponds	Leveled surface and tree plantation areas	6.0 ha.
Drainage Canals	Well maintained drainage canal	0.0033 ha.
Seedling Nursery	Well maintained seedling nursery	.03 ha.
	Sub-total for MEPS	6.033 ha.
	Grand Total	**169.343 ha.**

Project Component	Mitigating measures	Cost
Slopes Pit Floor	Stabilized slopes Leveled area and tree plantation for various of endemic and non-endemic species	10,114,500.00
Stockpiles areas	Decommissioning entails the re-contouring of the area to conform to nearby landmass using mine wastes and topped off the top soils with available vegetative and organic waste materials	
Siltation Ponds	All siltation ponds in the mining area will maintained until full rehabilitation of the mined-out parcels. As rehabilitation is progressive, settling ponds that are no longer required will be decommissioned and rehabilitated. The excavated materials may,	

	in the future, have economic value; otherwise, they will be used for backfilling or grading or will be removed from the site.	
Haul roads & mine access roads	If considered useful by the community, internal haul roads will be left behind; if not, these will be replanted. Water diversion measures will be installed for runoff interception & to enhance revegetation. Signs, guard rails & barriers will be removed or retained depending on consultation with the stakeholders. Roads & hard stands that will neither be needed for the decommissioning works nor useful to the community will be permanently blocked or revegetated as part of the rehabilitation activities.	
Motor pool & equipment maintenance areas	These will be decommissioned, the areas cleaned, any contaminated topsoil removed, & the ground leveled & re-contoured prior to its revegetation.	
Drainage channels, canals &/or culverts along the roads	These will be left behind to intercept runoff & deflect it towards the ditches, instead of flowing down the road surface, in order to prevent erosion & allow faster reestablishment of vegetation on the road.	
Fuel oil storage facilities	Tanks, pipings, bundings & any oil-contaminated structures & materials will be decommissioned & removed from the mining areas following the proper safety procedures & guidelines.	
Facilities such as personnel quarters, warehouse, workshops, storage areas, nursery, recreation facilities, & staff houses	Facilities/structures that are usable will be donated to the community. Non-usable facilities will be dismantled, the materials removed from the site, & their footprint rehabilitated.	
Port facilities	The port belongs to a private firm, the DMCI; hence, it will be up to DMCI what it plans for the property.	1,500,000.00
Unused laboratory chemicals & wastes	Remaining chemicals such as petrochemicals, reagents, & other associated chemicals will be collected & removed from the areas. Due to the progressive waste disposal policy, residual waste will be minimal.	126,000.00

10.2 Mine closure criteria and performance standards for all identified mine components

Initially, EMI had preliminary discussions with key stakeholders (LGU and DENR-Forestry technical personnel) regarding criteria for rehabilitation. It turn out that there maybe different success criteria for different domains or parts of the mine such as waste dumps, voids (settling ponds), waterways and diversions and infrastructure areas.

In general, the overall objective of mine rehabilitation is anchored on the best and suitable post land use of the area with the end view of attaining the following aspect:

- Protect public safety and health;
- Soil is stable and free from erosion and slumping;
- Water discharge or originating from the mine site and ore stockpile area will not adversely affect downstream fresh water environment;
- All mine and port structures are stable;
- Fulfill commitments in the rehabilitation of mined out areas (e.g. complete revegetation and monitoring result of environmental parameters conforms with DENR standard); and

- Release the mining claim owner and operator from further liability after the closure stage.

At every stage of the rehabilitation, the basis of completion criteria and guidelines are set of elements that will demonstrate the accomplishment of principles that rehabilitated areas and surrounding environment must achieve. The criteria to be set in order to accomplish the objective of the decommissioning plan are enumerated below per mine component:

Mined Out Areas – slopes and barren areas at the pit must be stable and resistant to erosion and slumping and should not be a potential source of hazard to public health and safety and the biological environment in the locality. Likewise, criteria on rehabilitation on mined out areas will be as close as to its original land use prior to mining operation which in this case is a tree plantation of specie such as Mindoro Pines being the request of the CENRO – Masinloc and the clamor of the Rotary Club of Sta. Cruz, a local NGO that advocates reforestation of denuded areas in Sta Cruz using said tree specie as planting stock.

Settling Ponds (SP) - is a repository of runoff which carries suspended solids. Hence, there is a need that SP perimeter embankments are structurally stable and resistant to erosion. Major long term objective is to ensure that the SP can be decommissioned or closed and yet will remain safe and stable into future without much maintenance for beneficial use of the community as source of water for irrigation. During summer months, water level in the irrigation canal is very low and vegetable farmers are the most adversely affected due to shortage if not lacking, water supply. A continuous consultation with the LGU-Barangay level shall be conducted to arrive at an agreed criteria regarding future usage of the settling ponds.

Building and Other Mine Facilities- All plant structures and facilities including laboratory must be structurally stable and properly maintained which shall be retained and again, consultation with LGU shall be made for possible turnover. However, the administration building will be retained for a certain period of time and it will be used as field office during implementation of FMRDP.

Ore Stockyard Area, Waste dumpsite and Causeway- Perimeter canal and silt ponds must be structurally stable and non-polluting and shall be retained and will be maintained by the company for future use.

Mining Component	Final Land Use	Methods/Approaches/Strategies	Success Closure Criteria
Mining area	Revegetated Area	This will entail using the materials from the waste dump, soil conditioning, planting with endemic species and maintenance works May be placed under DENR's Community Based Forest Management (CBFM) program	80% survival rate and self thriving plants
Facilities such as staff house, parking area, laundry, water tank, motorpool area, powerhouse, nursery, contractor's yard, assay laboratory	Donated to community	Facilities/structures that are usable will be donated to the community. Non-usable facilities will be dismantled and the materials removed from the site. Fixed facilities that can be used by the community will not be removed. Those that are not required are to be removed and their footprint rehabilitated. To be done after the life of the MPSA is attained. It must be emphasized that the company may opt to renew the MPSA for another 25 years.	Deed of donation
Siltation ponds	Revegetated area	All siltation ponds in the mining area will be maintained until full rehabilitation of the mined-out parcels. As rehabilitation is	80% survival rate and self thriving plants

		progressive, settling ponds that are no longer required will be decommissioned and rehabilitated. The excavated materials, may in the future have economic value; otherwise, these will used for backfilling, grading or removed from the site. May be placed under DENR's Community Based Forest Management (CBFM) program	
Haul roads and mine access roads	Retained for access	If considered useful by the community, internal haul road can be left. If not required, these will be re-planted; water diversion measures will be installed for run-off interception and to enhance revegetation. Signs, guard rails and barriers will be removed or retained depending upon the consultation with the stakeholders.	Usable roads
Unused laboratory chemicals and wastes	removed	Remaining chemicals such as petrochemicals, reagents, and other associated chemicals will be collected and taken away from the affected areas. Due to the progressive waste disposal policy, residual waste will be minimal.	Removed from site in accordance with procedures as per R.A. 6969

Table 6-2 Summary Matrix of Issues, Objective and Mitigation/Control on Closure Criteria

A. Closure criteria relating to mine infrastructure

Issues	Objectives	Control
a. Physical Stability		
▪ Buildings (admin, assay lab., contractors area) ▪ Equipment /Machineries ▪ Roads	❖ Make area safe ❖ Control access	❖ Disassemble and remove buildings and other services ❖ Excavate buried fuel tanks and backfill ❖ Restore drainage ❖ Revegetate
b. Chemical Stability		
▪ Fuel and chemical storage areas ▪ Fuel or oil spills	❖ Make area secure and safe ❖ Clean water	❖ Remove all unwanted materials ❖ decommissioned and removed from the mining area, observing the correct safety procedures and guidelines ❖ remaining chemicals such as petrochemicals, reagents and other associated chemical will be collected and taken away from the affected areas ❖ Treat contaminated soil or disposed of to DENR accredited treater ❖ Control and treat drainage

c. Land use		
▪ Alternative land use ▪ Productivity ▪ Visual impact	❖ Tree plantation / Agro – forestry	❖ Remove foundations and re-contour ❖ Restore natural drainage ❖ Re - vegetate

Note: All unwanted materials that will be removed and disposed are hazardous chemicals and even used-fuel or oil.

B. Closure criteria relating to open pit mine workings

Issues	Objectives	Control
a. Physical Stability		
▪Steep slopes ▪Unstable excavation / mined out areas ▪Erosion ▪Hydrology ▪Safety	❖ Stable surfaces ❖ Remove hazard ❖ Control erosion ❖ Clean water	❖ Re-contour ❖ Establish vegetation ❖ Fencing and safety sign installation ❖ Bunding ❖ Install drainage
b. Chemical Stability		
▪ Metal leaching	❖ Clean water ❖ Meet DENR water quality standard for Class C waterbody	❖ Containment and Treat discharge ❖ Control hydrology / hydrogeology
c. Land use		
▪Productivity ▪Visual impact ▪Drainage	❖ Restore to original or accepted alternative use ❖ Adequate drainage system	❖ Backfill or topsoiling ❖ Re-contour ❖ Re-vegetation / Agroforestry

C. Closure criteria relating to overburden/waste

Issues	Objectives	Control
a. Physical Stability		
▪Steep slopes ▪Unstable benches/faces ▪Erosion ▪Drainage ▪Dust	❖ Stable surfaces ❖ Avoid failures, slumps and sediment release	❖ Internalize drainages ❖ Re-contour surfaces ❖ Settling ponds ❖ Revegetation ❖ Monitor
b. Chemical Stability		
▪Metal leaching ▪Laboratory reagents ▪Contaminants	❖ Clean water ❖ Avoid soil and water contamination	❖ Control drainage ❖ Revegetation ❖ Collect and treat effluent ❖ Monitor
c. Land use		

▪Productivity ▪Visual impact ▪Drainage	❖ Restore to original or acceptable alternative use	▪ Re-contour ▪ Revetetation

D. Closure criteria relating to settling ponds/runoff catchbasin

Issues	Objectives	Control
a. Physical Stability		
▪Dust ▪Erosion ▪Pond retaining wall ▪Drainage	❖ Stable surfaces ❖ Avoid failures and slumps ❖ Control sediments	❖ Regularly and properly maintained pond retaining wall ❖ Revegetation ❖ Backfill
b. Chemical Stability		
▪Metal leaching ▪Laboratory reagents ▪Pond structure	❖ Clean water	❖ Divert runoff ❖ Collect and treat effluent ❖ Monitor
c. Land use		
▪Productivity ▪Visual impact	❖ Restore to appropriate land use	❖ Re-contour and establish vegetation or ❖ Retain for use as impounding of water for use by local people to augment sources of water for irrigation purposes.

10.3 DETAILS OF DECOMMISSIONING PLAN

10.3.1 List of areas and equipment that requires decommissioning

All areas listed above are to be decommissioned except the administration building.

The transfer of social assets and services will depend on the outcome of the consultation with the stakeholders in the future. Facilities such as staff house, parking area, laundry, water tank, motorpool area, powerhouse, nursery, can be transferred to the LGU after the life of the MPSA.

Generator sets and all earth moving equipment as listed in section 2.5.1 of the EPEP will be demobilized.

Below is the list of areas to be decommissioned:

i. Mining operations
ii. Nickel ore beneficiation areas;
iii. Silt ponds/catch basin
iv. Ore stockpile areas at the pier
v. Causeway operations

10.3.2 Description of the decommissioning strategy, timing and the techniques chosen for each mine components including mitigation measures to minimize potential adverse environmental impact/s.

Dismantling and decommissioning activities shall be contracted to local contractor as part of the company's social commitment regarding employment generation. However, the activities shall be supervised by EMI engineers to ensure that the perceived risk will be properly addressed and avoided and that the criteria for rehabilitation shall be achieved.

The decommissioning strategy of EMI is as follows:

a. Formation of EMI management organization whose duties and responsibilities are to plan and supervise the activities of the rehabilitation and decommissioning program;
b. Selection of qualified personnel required in the implementation of rehabilitation / decommissioning;
c. Inventory and assessment of equipment / machineries;
d. Implementation of decommissioning activities with close supervision from the management team;
e. Physical assessment of the team on the accomplishment of the decommissioning of facilities and equipment;
f. Recommend for rehabilitation of the areas affected by the decommissioning activities.

10.3.3 Description of any special procedures or precautions to be used to ensure safety during decommissioning

All facilities within the mine and ore stockpile area shall be decommissioned without the use of special procedures. The only major component of the activity is the dismantling of laboratory structures and machineries which will not require also the use of special procedures. However, precautionary measures will be adopted in handling remaining stocks of chemical reagents and delicate laboratory instruments.

Safety procedures in handling and storing chemical reagents are indicated in the material data sheet (MDS) and therefore shall serve as guide during decommissioning of the laboratory facilities and the stored chemicals. The company's chemist shall take the responsibility in the supervision of the activity. After collecting the remaining chemical reagents and transported the same to a safe location and final destination, dismantling of the building structures will follow.

Liquid wastes from various analyses are generally acidic. These wastes are collected and stocked in large plastic pails, covered and discarded to a septic tank lined with plastic sheets. The septic tank is made of concrete and has two compartments. One compartment with concrete flooring is the treatment tank. Liquid wastes that accumulated during the shift are discarded and are treated with lime solution. Treatment with lime neutralizes the acidic solution and eliminates its toxicity and makes its risk-free.

The other compartment has gravel as its flooring. It is here where the neutralized solutions and laboratory washings are coursed and seeped to the ground.

Harmless gaseous fumes from the digestion chamber during sample extraction are released to the atmosphere via a chimney installed over the digestion chamber, where blowers and exhaust fans should also be installed.

All empty chemical bottles are immediately rinsed with water and disposed it to DENR accredited transporters/buyers. As with other glassware for disposal, broken glass tools and are also rinsed by spraying with water, stored in covered tin cans and disposed to DENR accredited buyers. Other solid wastes include that plastic containers, used filter papers, tin cans and cellophanes are disposed in designated dump site at the mine site. Proper handling, storage and disposal will be observed in conformance to R.A. No. 6969 and will be a component of the company's Safety and Health Program.

- Attach MDSs for the chemical reagents

Solutions	AAS Standard Solutions
Acetic Acids	Cobalt Nitrate
Ammonia Solutions	Iron Nitrate
Dioxane	Nickel Nitrate
Ethanol	Manganese Nitrate
Hydrochloric Acid	Solids
Hydrofluoric Acid	Diphenylamine Sulfonic Acid Sodium Salt
Nitric Acid	Potassium Dichromate
Perchloric Acid	Sodium Chloride
Phosporic Acid	Sodium Hydroxide
Sulfuric Acid	Silica Gel
Triethanolamine	Starch
Solids	Tartaric Acid
Aluminum Powder	Tin Chloride
Ammonium Nitrate	Stannous Chloride
Ammonium Chloride	Sodium Acetate Trihydrate
Citric Acid	

Material Safety Data Sheet (MSDS) for each chemical indicates the manner of handling and emergency measures during accidental exposure. The Assay laboratory maintains a record of MSDS for each chemical. Emergency responses during chemical accidents are detailed in Occupational Health and Safety Program.

10.4 Details of Final Mine Rehabilitation Plan

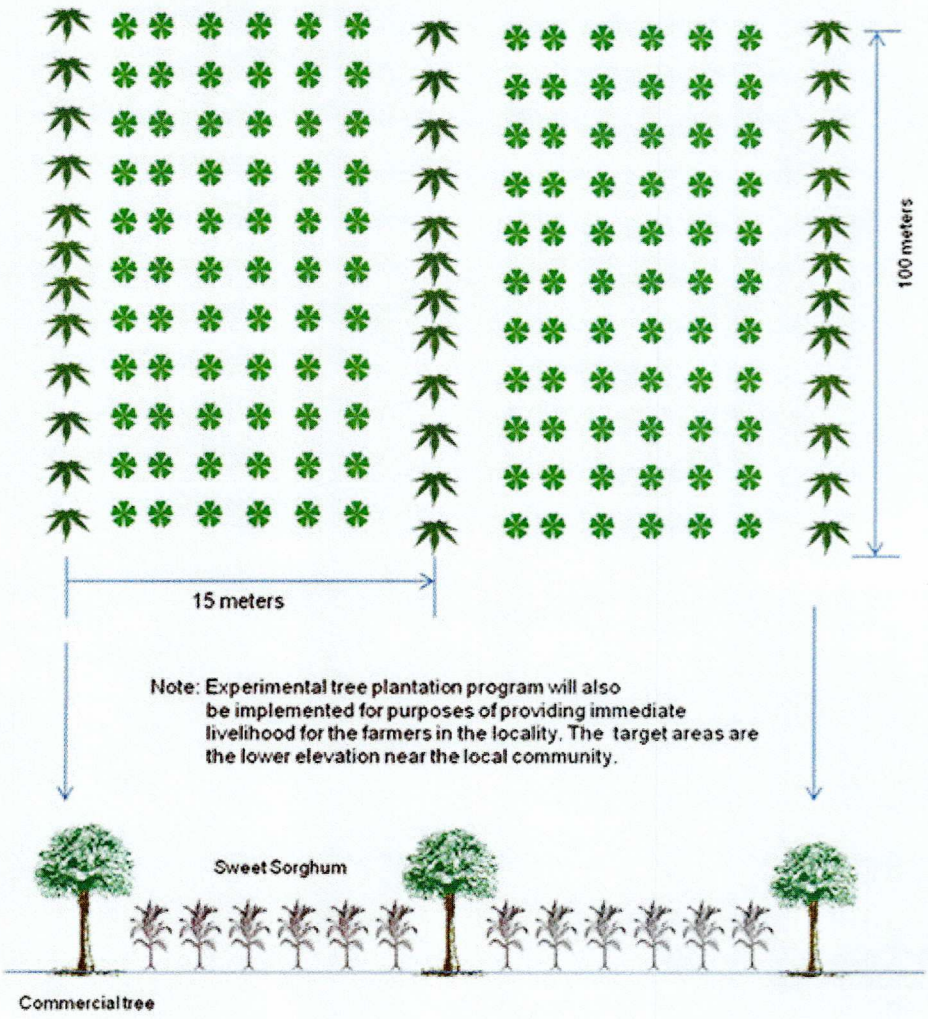
Again, it is hereby emphasized that during progressive rehabilitation, majority of the disturbed land will be fully reclaimed and rehabilitated and only about 10% will have to be addressed at the FMRDP phase. The proposed 12-year mine life will be covered by the EPEP implementation and on the 13th year, FMRDP activities shall be implemented.

Description of the rehabilitation strategy, timing and techniques chosen to meet the rehabilitation success and closure criteria

It is the main objective of this undertaking that mine decommissioning and rehabilitation plan shall start even before the mine is commissioned. The main objective is that as each block of nickel deposit is cleared, it is mined and progressively rehabilitated. By careful planning and active progressive rehabilitation from the start of operations, it is estimated that costs of final rehabilitation is extremely well controlled.

General site rehabilitation involved re-contouring and top-soiling and seed mix broadcasting and tree planting. Earth moving shall be carried out during dry season while seed broadcasting and tree planting work shall be typically carried out during rainy season to ensure enough moisture for germination.

The main aim of rehabilitation of mined out areas is to re-establish a self-sustaining Mindoro Pine forest ecosystem, this, being the clamor of the local NGO in Sta. Cruz, the Rotary Club of Sta. Cruz. Mindoro Pines is endemic in the mountain areas of Sta. cruz and thrives well at higher elevation (400 masl and above). Thus the mined area will consist of natural Mindoro Pine forest interspersed with areas of rehabilitation. Additionally, in low lying areas within proximity to communities, agro-forestry will be adopted. Attached figure shows the cropping pattern in the agro-forestry program of mine rehabilitation practice (Spatial Arrangement of Commercial Trees and sweet Sorghum)



Spatial Arrangement for Commercial Trees and Sweet Sorghum

Indicative Time Line for the Rehabilitation Activities

a. Operational Period – mining operations continuous where possible and disturbed areas are progressively rehabilitated through the Environmental Protection and Enhancement Program (EPEP);

b. Closure Period – EMI will rehabilitate remaining disturbed land after the life of the mine while continuing to monitor and maintained the land.

c. Post Closure Period – activities will focus to monitor and maintain the rehabilitated land in perpetuity; and,

d. Relinquishment period – continuously monitors and maintains the area and conduct audit of the accomplishment with aim to obtain clearance for final relinquishment of the area.

(Indicative Timeline for FMRDP)

EPEP STAGE **FMRDP STAGE**

10.4.1 Details of the monitoring program to evaluate success against the rehabilitation completion criteria

EMI will design and implement an in-house rehabilitation monitoring program or the self-monitoring program (SMR) based on the format set by the Environmental Management Bureau. Likewise, the Mines Rehabilitation Fund Committee through its monitoring arm, the Multi-Partite Monitoring Team shall regularly conduct monitoring activities of the rehabilitation areas. Additionally, MGB shall also conduct periodic audit of the activities and progress of the FMRDP.

Typically, monitoring of rehabilitation will include the following:

- An assessment of surface and slope stability
- Properties of the soil or root zone media
- Plant community composition (such as presence of desired species, weeds)
- Vegetation species richness
- Faunal migration and activity (if necessary).

10.4.2 Details of Social Plan

Social impact due to closure will be mitigated by the company by adopting or implementing the following strategies:

- Provision for redundancy package – workers will be paid an equivalent of 1 month salary for every year of continuous and un-interrupted service to the company. In addition, to avoid abrupt displacement of the workforce, gradual retrenchment will be implemented which shall be implemented within three (3) years before mine closure;
- Food security – Implement agricultural training and other support such as establishment of lending cooperative, store cooperative, etc to ensure that they can re-establish the ability to again grow all they need;
- Continue to implement the Social Development Program particularly on poverty alleviation program for the most vulnerable sector of the society – older people, single mothers who may be least able to find ways to cope when the community income drops; and
- Promote revenue stability initiatives needed to help local government maintain the level of income or living standards of the community well above the non-mining community level of income.
- Labor Support Initiatives – this includes assistance to employees on job search and training to improve the skills of the employees for their future career.

10.5 Details of Maintenance and Monitoring Plan

The main objective of the rehabilitation program is to develop a stable landform with self-sustaining and vigorously growing vegetative cover within the mined out area and other disturbed areas. Hence, maintenance and monitoring plays a vital role in the attainment of the objective.

Appropriate maintenance activities for the planted vegetation shall be done regularly particularly during dry season and after occurrence of typhoon or bad weather condition which normally pass the northern part of the country from July to October. Maintenance activities include watering of seedlings, application of organic fertilizer and mulching, de-weeding and grass cutting, etc.

Other areas shall be maintained and monitored as follows:

- Maintain good housekeeping at all working place and records all activities conducted;
- Monitor siltation control measures particularly the stability of the siltation ponds and drainage system;
- Monitor air, water and noise quality in the project area;
- Monitor compliance of workers on wearing of PPE;
- Maintenance and monitor hazardous wastes (used oil, used batteries and mercury bulb, chemical reagents) storage area; and
- Monitor collection, segregation and disposal of solid wastes.

Component	Mitigating Measures
Within the Project Area	Maintain good housekeeping at all working place and records all activities conducted
Mining structures	Monitor siltation control measures particularly the stability of the siltation ponds and drainage system
Air. water and noise quality	Monitor air, water, noise quality in the project area
Safety and health	Monitor compliance of workers on wearing PPE
Monitoring of hazardous materials	Maintenance and monitor hazardous wastes (used oil, used batteries, mercury bulb and chemical reagents) storage area
Disposal of solid wastes and hazardous materials	Monitor collection, segregation and proper disposal of solid wastes and hazardous materials
Haul and access roads	Maintain and monitor the drainage system Regular spraying of roads Monitor the traffic management plan
Mined-out areas	Annual assessment of vegetation to check the specie richness, growth rate, survival and mortality Stability of the siltation control facilities
Social plan	Monitor the effectiveness of social package plan

10.5.1 Maintenance and monitoring program and procedures to ensure that closure objectives are being achieved and to evaluate success against the agreed completion criteria.

The area of disturbance subject to monitoring and maintenance in order to ensure that closure objectives are being achieved comprises the following component of the mine:

a. Mined out areas - 120 hectares
b. Ore stockyard / beneficiation areas– 26 hectares
c. Roads – aggregate length of 35.7 kilometers
d. Settling ponds (mine site) – 6 hectares
e. Pier Yard – 5 hectares
f. Mine facilities – 8,300 square meters

Monitoring of the rehabilitated areas shall continue for a total of 10-year period covering the closure period and during post closure period to determine efficacy of the program based on the agreed rehabilitation criteria, i.e, that the site is non-polluting and the landform and vegetation is stable. Monitoring shall focus on the following:

- Surface and ground water quality determination during dry and wet season;

- Annual assessment of vegetation to check growth rate, mortality and other natural vegetation specie/s that may have colonize the area;
- Stability of the siltation control facilities such as catch basin and drainage canal system; and
- Effectiveness of social package plan.

The MEPE Office will continue to exist for the rehabilitation of the area and some retrenched workers will be utilized/participated in the reforestation/rehabilitation activities in the decommissioning stage. The said Office will also continue to host the regular MMT monitoring for the compliance of the ECC conditionalities even during Closure period. As such, a monitoring matrix for this plan shall be formulated and agreed by the Mine Rehabilitation Fund Committee (MRFC) that shall form part as basis for MMT monitoring aside from the ECC. The number of personnel to man the implementation of the plan is one (1) environmental officer, one (1) safety officer and one (1) community relations officer. However, the total workers for each specific areas of work will be determined before the closure of the mine.

11.0 SCHEDULE OF OPERATIONS AND COSTS

The estimated cost of the Final Mine Rehabilitation and Decommissioning Plan is approximately PhP 18,735,060.00. This will cover the implementation of FMR/DP activities up to relinquishment for a period of ten (10) years after closure. That is three (3) years for rehabilitation and decommissioning activities and five (5) years for monitoring and maintenance and another two (2) years for government environmental audit and final relinquishment.

The cost estimates considers the present value. Nevertheless, the periodic review of the FMR/DP every two (2) years will provide the proper venue for the consideration of inflation and adequacy of the FMR/DP.

Table 7-1 Estimated FMRDP Budget

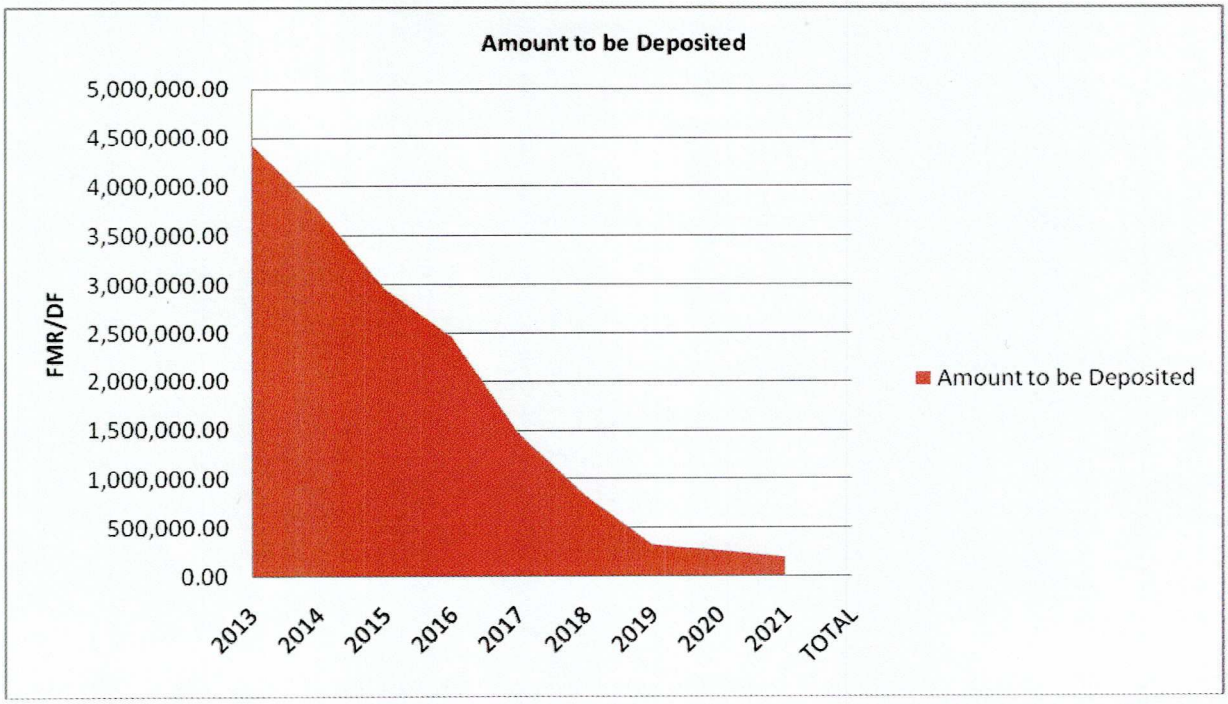
Description Project Activity	Activity (unit)	No. of Units to Complete Rehabilitation	Unit Cost to Rehabilitate (PHP)	Cost to Complete Each Activity (PHP)
Progressive Rehabilitation of Mine Out Areas and Mine Affected Areas.	Slope stabilization, clearing, topsoiling, spreading and leveling and revegetation (hectares)	Progressive rehabilitation during mine life is programmed to revegetate about 90% of the disturbed areas equivalent to 102.0 hectares	The activities are part of the operational stage and in the EPEP implementation.	0
	Surface preparation for mined out area and settling ponds (topsoiling, slope stabilization, spreading/leveling)	Remaining disturbed areas for backfilling & leveling : Mined out area = 18 ha.; settling ponds = 6 has, for a total of 24.0 ha.	156,750.00 / ha	3,762,000.00
	Surface preparation for north/south ore stockyard and other facilities**	Approximate area = 26 ha.	P 15,000 / hectare – labor cost for clearing of rocks and removal of unwanted materials	390,000.00
	Rehabilitation by revegetation of appropriate tree species	Aggregate area of 50.0 hectares including mined	19,250.00 / ha	962,500.00

		out areas, support facilities, road sides and riverbanks		
	Rehabilitation of drainages and run-off diversion canals (dredging, installation of culverts & gabions).	Aggregate length of 10 linear kilometers (pre-piling stockyard and newly revegetated areas).	500,000.00 / km.	5,000,000.00
			Sub-Total Cost	**10,114,500.00**
Assay Laboratory Area	Dismantling	1 assay lab	100,000.00	100,000.00
	Surface preparation (clearing/ top soiling and landscaping)	0.20 hectares	20,000.00	20,000.00
	Rehabilitation (planting of appropriate ornamental tree species)	0.20 hectares	6,000.00	6,000.00
Support Facilities	Removal / Decommissioning and Area Stabilization (pier yard, causeway)	5.30 hectares	1,500,000.00	1,500,000.00
Maintenance and Monitoring	Monitoring	Quarterly for 10 years	150,000.00	6,000,000.00
	Maintenance	Annually for 10 years	50,000.00/ha	500,000.00
			Sub-Total Cost	**8,126,000.00**
			Total Estimated FMRDP Cost	**18.240,500.00**

The implementation, maintenance and monitoring of the FMR/DP will take ten (10) years. Monitoring and maintenance period will start as soon as the rehabilitation and decommissioning starts in the FMRDP phase, hence, a ten (10) year period is allotted for budget purposes as indicated in the above schedule.

Schedule of Annual Cash Provisions to the FMRDF

Year	D.A.O. 2005-07 Factor	Amount to be Deposited
2013	0.265	4,833,732.50
2014	0.225	4,104,112.50
2015	0.177	3,228,568.50
2016	0.147	2,681,353.50
2017	0.088	1,605,164.00
2018	0.050	912,025.00
2019	0.020	364,810.00
2020	0.016	291,848.00
2021	0.012	218,886.00
TOTAL		**18,240,500.00**



12.0 NAME AND SIGNATURE OF PERSON(S) PREPARING THE EPEP and FMR/DP

EPEP Prepared By:

ALEXANDRIE D. AMADEO
Mining Engineer
PRC EM No. 2447

FMRDP Prepared By:

ELMER CRISOLOGO
Mining Engineer
PRC EM No. 2222

Approved By:

ENRIQUE C. FERNANDEZ
President
ERAMEN MINERALS, INC.

13.0 Maps

Map 1	-	Location Map of EMI-MPSA
Map 2	-	Nickel Distribution in Saprolite
Map 3	-	Nickel Distribution in Limonite
Map 4	-	Topographic 3-D Map of the MPSA Area
Map 5	-	Site Development Plan
MAP 6	-	Mine Plan
MAP 7	-	Progressive Rehabilitation Map
MAP 8	-	Final Land Use Map

14.0 Annexes

EPEP Annex 1	-	Mineral Production Sharing Agreement (MPSA) (MPSA #209-2005-111)
EPEP Annex 2	-	Environmental Compliance Certificate (ECC) (ECC #0605-003-2140)
EPEP Annex 3	-	Approved Social Development & Mgmt Program (SDMP #012-2008-02-111)
EPEP Annex 4	-	Environmental Protection and Enhancement Program (EPEP) Cost
FMRDP Annex 1	-	Geographic Coordinates of the Project
FMRDP Annex 2	-	Matrix of Environmental Management Plan
FMRDP Annex 3	-	Matrix of Environmental Monitoring Plan
FMRDP Annex 4	-	Complete Listing of Flora within the Mining Project
FMRDP Annex 5	-	Location Map of the Environmental Monitoring Stations
FMRDP Annex 6A	-	Site Development Plan Block 5
FMRDP Annex 6B	-	Site Development Plan Block 7
FMRDP Annex 7A	-	Reforestation Sequence Block 5
FMRDP Annex 7B	-	Reforestation Sequence Block 5
FMRDP Annex 8	-	Image of Typical Spatial Transplanting
FMRDP Annex 9	-	Layout and Section of the Overburden Stockyard

15.0 LIST OF REFERENCES

- Eramen Minerals, Inc., Environmental Impact Assessment
- Eramen Minerals, Inc., Mine Development Plan
- DENR Administrative Order No. 96-40, Revised Mines Implementing Rules and Regulations (RIRR) of R.A. 7942
- MRD-51, Revised Mine Safety Rules and Regulations, MGB
- DENR Administrative Order No. 14 & 14A, Air Quality Criteria, EMB
- DENR Administrative Order No. 34, Water Quality Criteria, EMB
- DENR Administrative Order No. 35, Effluent Regulation, EMB

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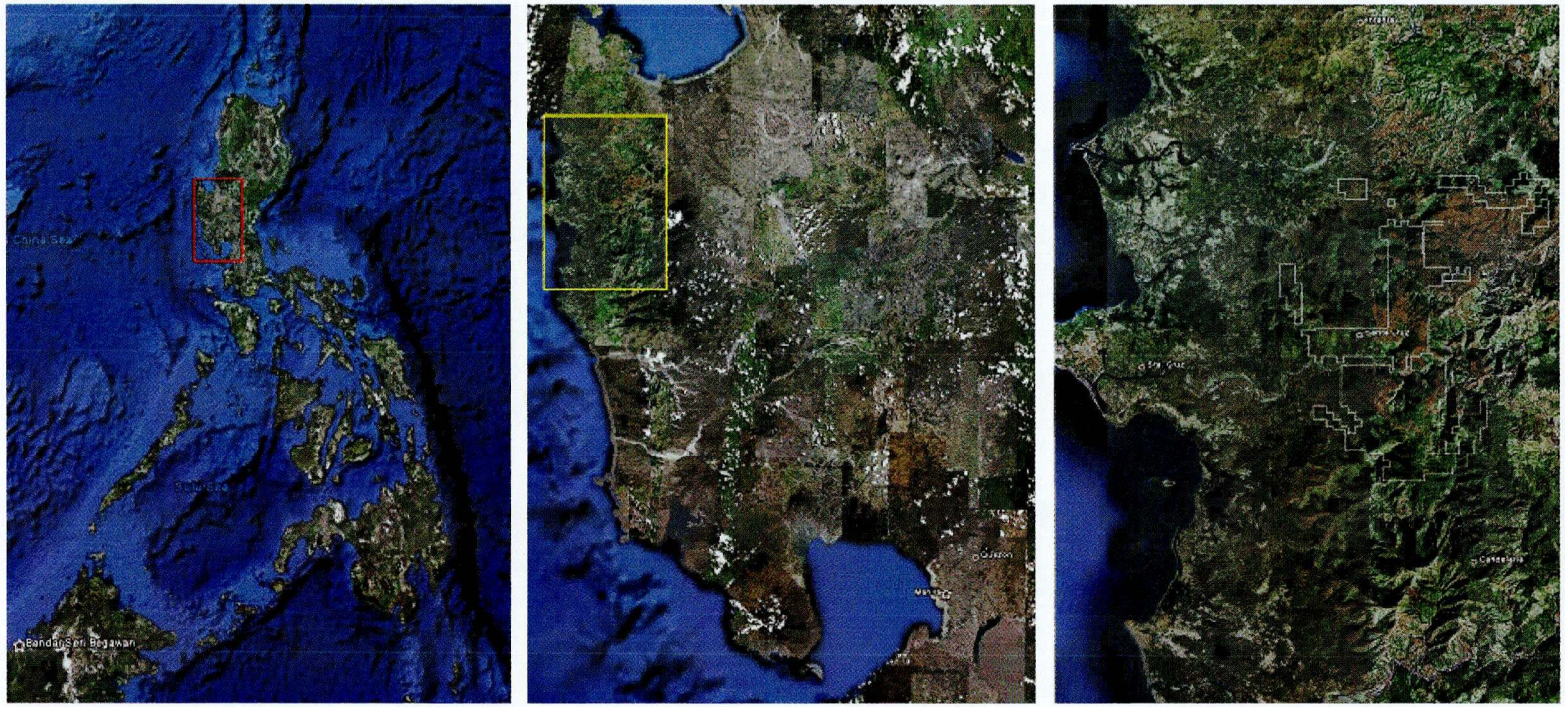
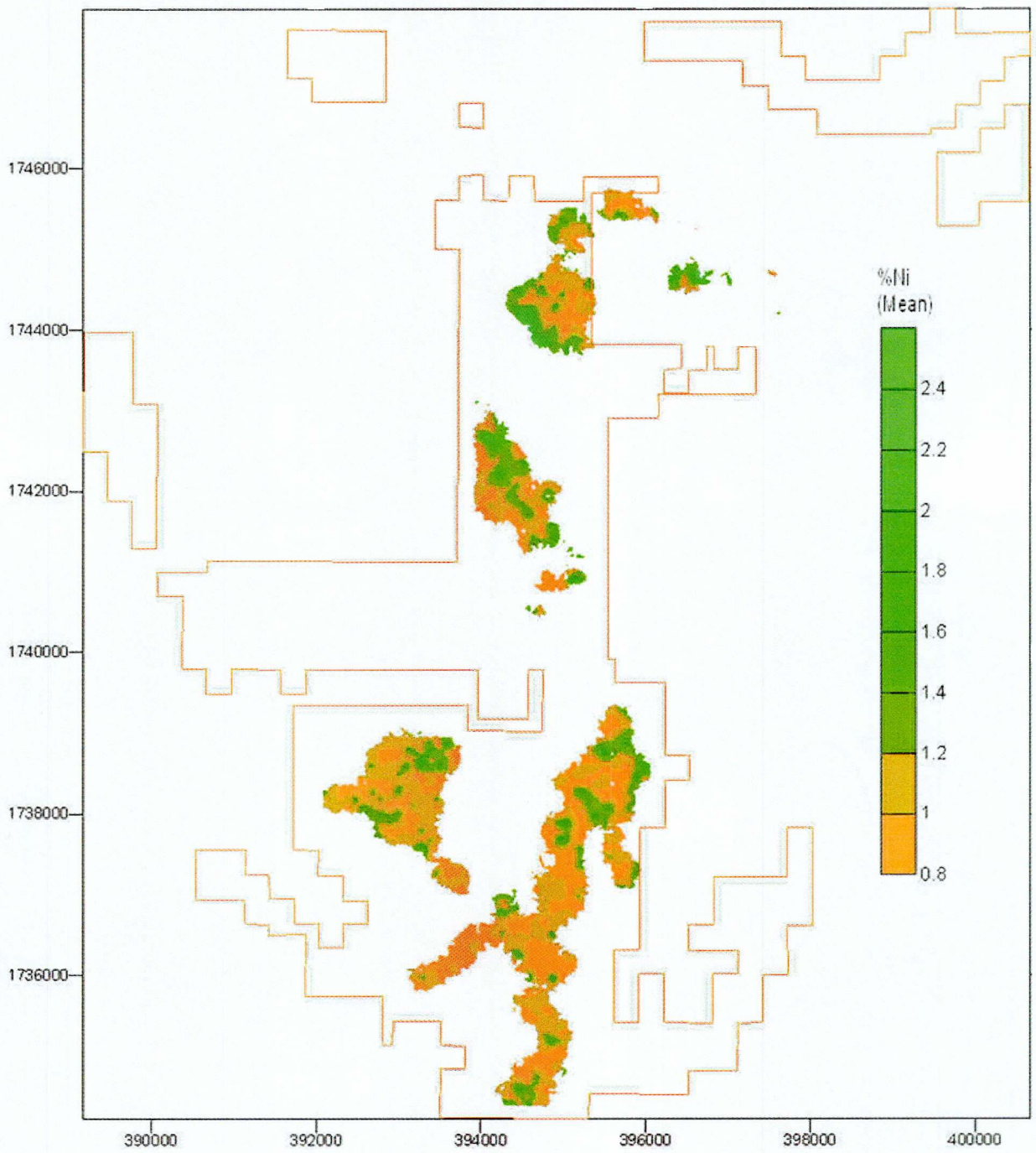
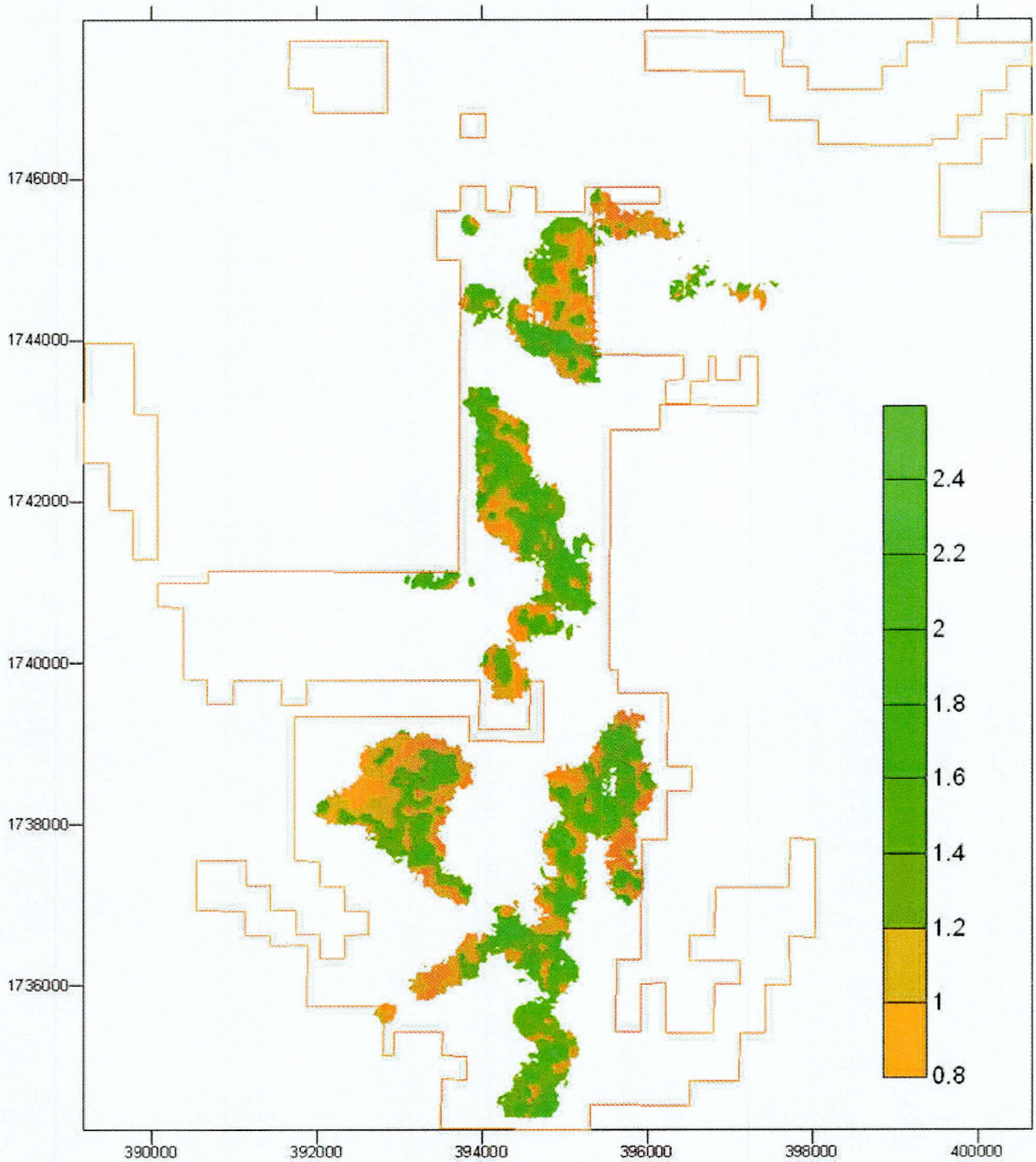
MAPS



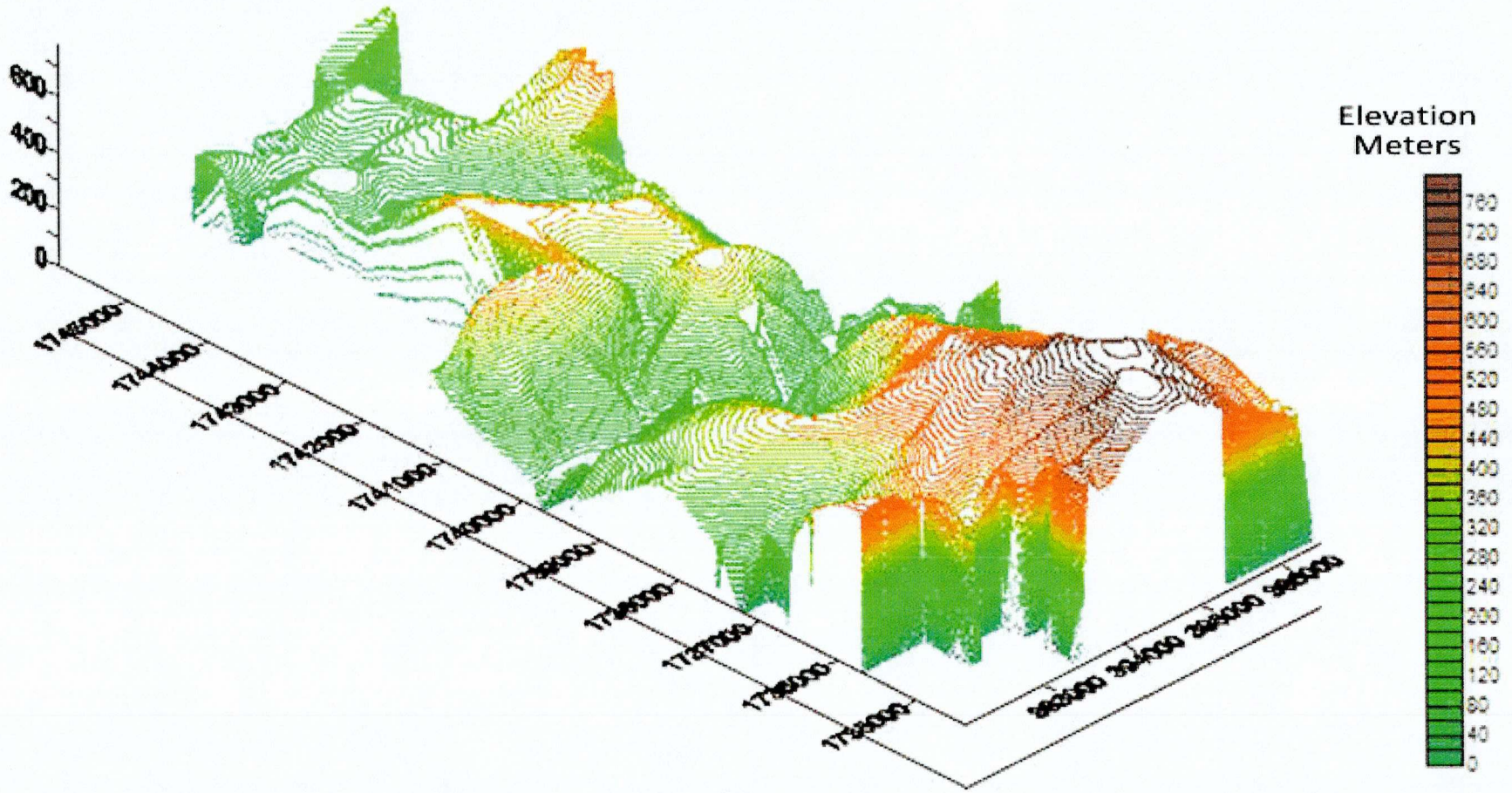
ERAMEN MINERALS INC. Nickeliferous Laterite Mining Project Sta. Cruz and Candelaria, Zambales	Location Map of EMI-MPSA	MAP 1



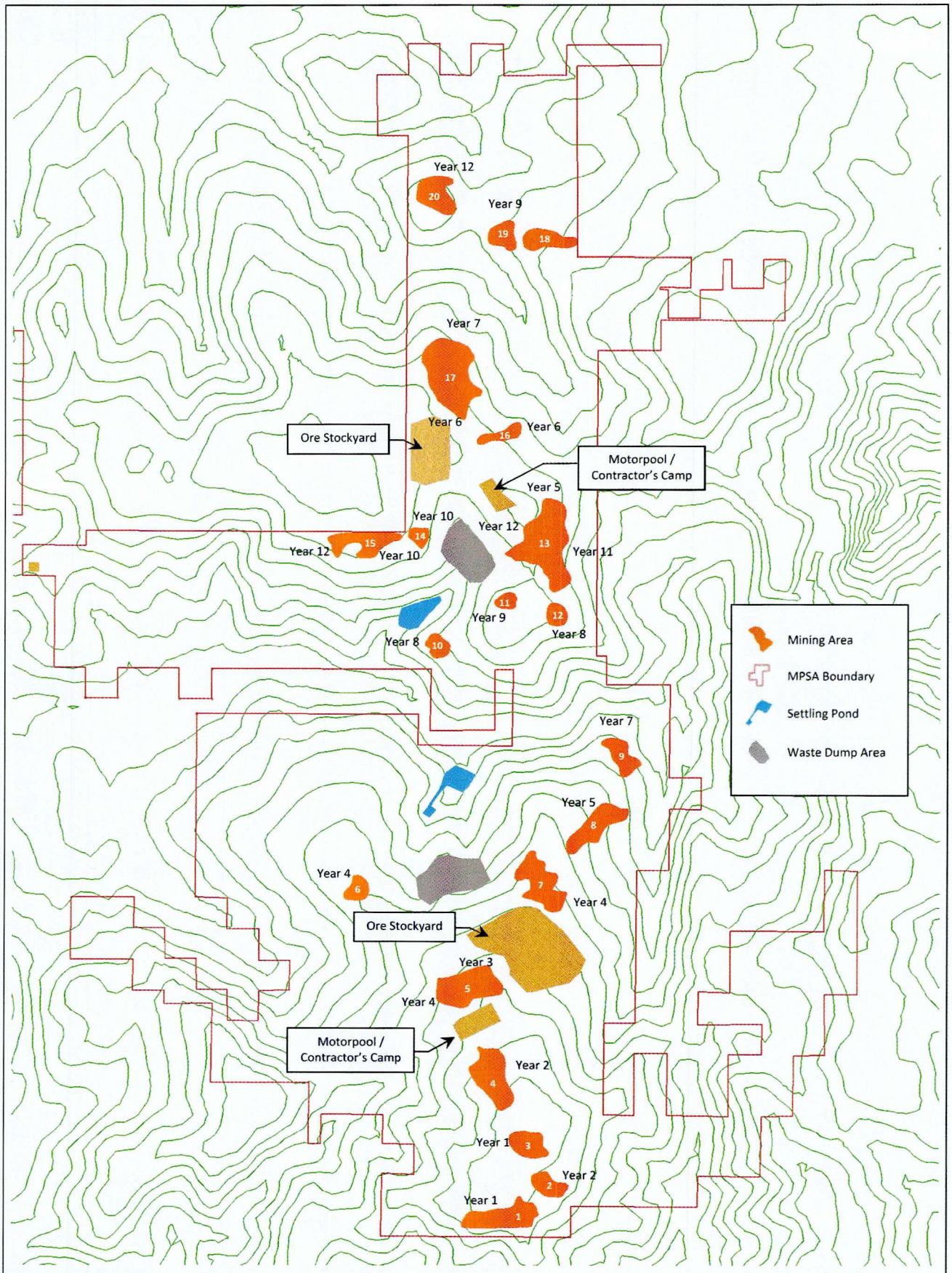
ERAMEN MINERALS INC. Nickeliferous Laterite Mining Project Sta. Cruz and Candelaria, Zambales	Limonite Distribution in Block 5 and Block 7	MAP 2



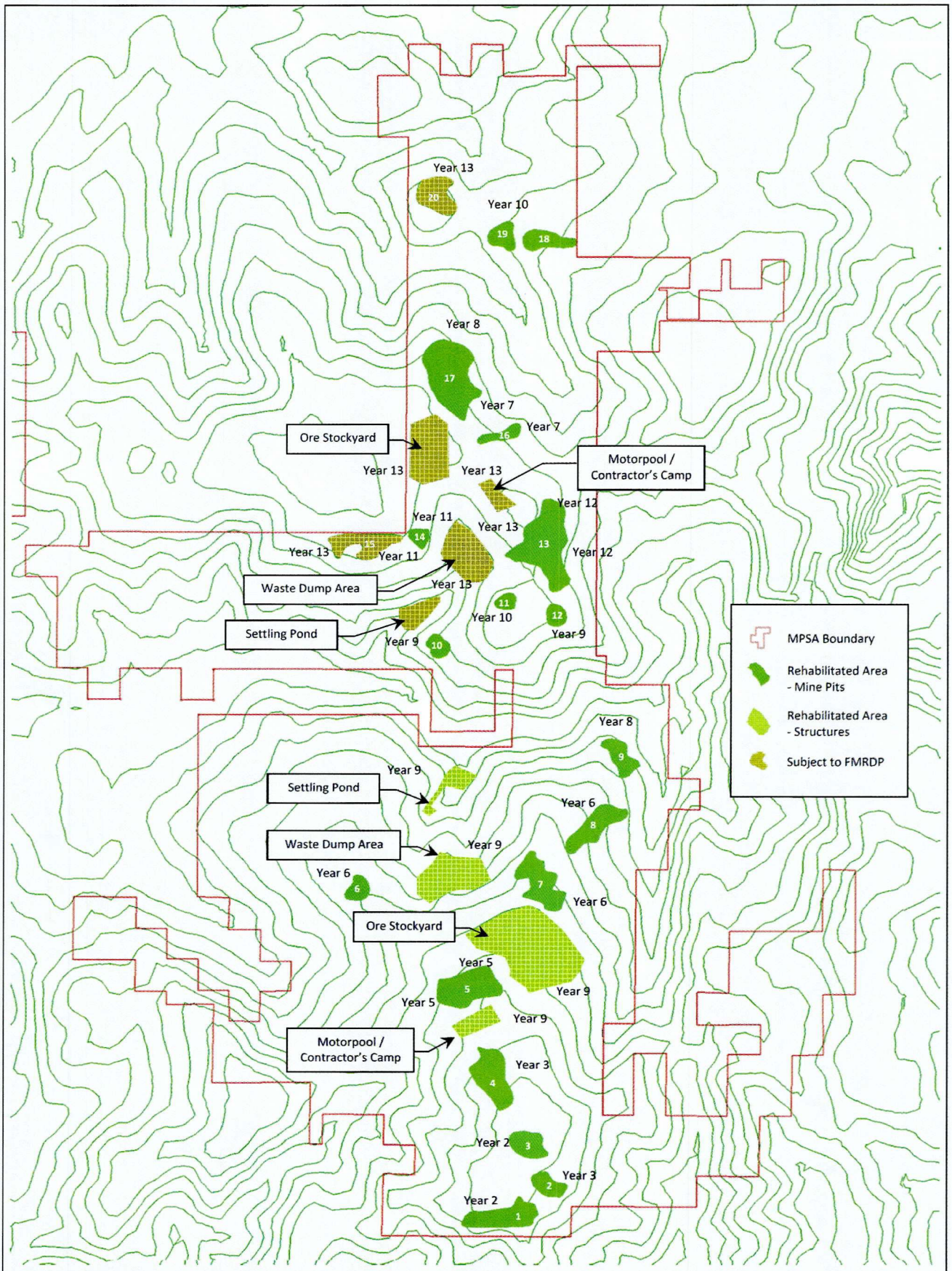
ERAMEN MINERALS INC. Nickeliferous Laterite Mining Project Sta. Cruz and Candelaria, Zambales	Saprolite Distribution in Block 5 and Block 7	MAP 3



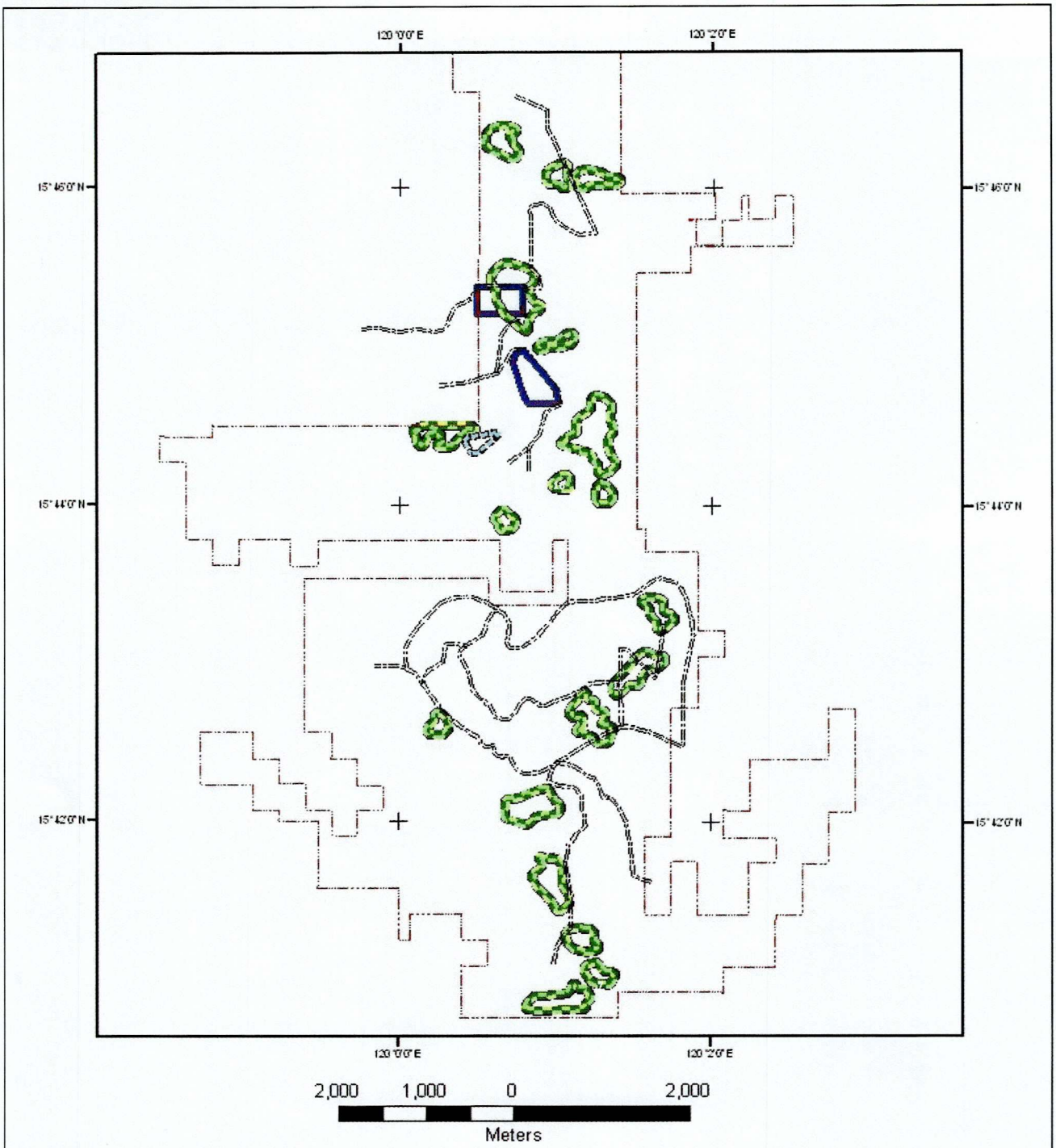
ERAMEN MINERALS INC. Nickeliferous Laterite Mining Project Sta. Cruz and Candelaria, Zambales	Topographic 3-D Map of the MPSA Area	MAP 4



ERAMEN MINERALS INC. Nickeliferous Laterite Mining Project Sta. Cruz and Candelaria, Zambales	Site Development Plan Year to Year Projection	MAP 5



ERAMEN MINERALS INC. Nickeliferous Laterite Mining Project Sta. Cruz and Candelaria, Zambales	Progressive Rehabilitation Map	MAP 6



FINAL LAND USE MAP

ERAMEN MINERALS, INC.
NICKEL PROJECT
Sta. Cruz, Zambales

Legend

- roads
- WaterPond
- EMI_MPSA PTM
- TreePlantations
- Agroforest

ERAMEN MINERALS INC. Nickeliferous Laterite Mining Project Sta. Cruz and Candelaria, Zambales	Final Land Use Map	MAP 7

ANNEXES

MINERAL PRODUCTION SHARING AGREEMENT

No. 209-2005-III

This **MINERAL PRODUCTION SHARING AGREEMENT** is made and entered into in Quezon City, Philippines, this _____ day of APR 1 2005 by and between:

THE REPUBLIC OF THE PHILIPPINES, herein referred to as the GOVERNMENT, represented in this act by the Secretary of the Department of Environment and Natural Resources, with offices at the Department of Environment and Natural Resources Building, Visayas Avenue, Diliman, Quezon City

and

ERAMEN MINERALS, INCORPORATED, a corporation duly organized and existing under the laws of the Republic of the Philippines, herein referred to as the CONTRACTOR, with office at 3RD floor, ALPAP I Building No. 140 Leviste Street, Salcedo Village, Makati City and represented in this act by its President, **ENRIQUE C. FERNANDEZ**, as authorized by its Board of Directors (please refer to ANNEX "A")

WITNESSETH :

WHEREAS, the 1987 Constitution of the Republic of the Philippines provides in Article XII, Section 2 thereof that all lands of the public domain, waters, minerals, coal, petroleum and other natural resources are owned by the State and that their exploration, development and utilization shall be under the full control and supervision of the State;

WHEREAS, the Constitution further provides that the State may directly undertake such activities, or it may enter into a Co-Production, Joint Venture, or Mineral Production Sharing Agreement with Filipino citizens, or cooperatives, partnerships, corporations or associations at least sixty per centum of whose capitalization is owned by such citizens;

WHEREAS, pursuant to Republic Act No. 7942, otherwise known as "The Philippine Mining Act of 1995," which took effect on 09 April 1995, the Secretary of the Department of Environment and Natural Resources is authorized to enter into Mineral Production Sharing Agreements in furtherance of the objectives of the Government and the Constitution to bolster the national economy through sustainable and systematic development and utilization of mineral lands;

WHEREAS, the Government desires to avail itself of the financial resources, technical competence and skill, which the Contractor is capable of applying to the

mining operations of the project contemplated herein;

WHEREAS, the Contractor desires to join and assist the Government in the initial rational exploration and possible development and utilization for commercial purposes of certain nickel, cobalt, chromite and other associated mineral deposits existing in the Contract Area (as herein defined);

WHEREAS, the Contractor has access to all the financing, technical competence, technology and environmental management skills required to promptly and effectively carry out the objectives of this Agreement;

NOW, THEREFORE, for and in consideration of the foregoing premises, the mutual covenants, terms and conditions hereinafter set forth, it is hereby stipulated and agreed as follows:

SECTION I

SCOPE

1.1. This Agreement is a Mineral Production Sharing Agreement entered into pursuant to the provisions of the Act and its implementing rules and regulations. The primary purpose of this Agreement is to provide for the rational exploration, development and commercial utilization of certain nickel and other associated mineral deposits existing within the Contract Area, with all necessary services, technology and financing to be furnished or arranged by the Contractor in accordance with the provisions of this Agreement. The Contractor shall not, by virtue of this Agreement, acquire any title over the Contract/Mining Area without prejudice to the acquisition by the Contractor of the land/surface rights through any mode of acquisition provided for by law.

1.2. The Contractor shall undertake and execute, for and on behalf of the Government, sustainable mining operations in accordance with the provisions of this Agreement, and is hereby constituted and appointed, for the purpose of this Agreement, as the exclusive entity to conduct mining operations in the Contract Area.

1.3. The Contractor shall assume all the exploration risk such that if no minerals in commercial quantity are developed and produced, it will not be entitled to reimbursement.

1.4. During the term of this Agreement, the total value of production and sale of minerals derived from the mining operations contemplated herein shall be accounted for and divided between the Government and the Contractor in accordance with Section VIII hereof.

SECTION II

DEFINITIONS

As used in this Agreement, the following words and terms, whether singular or plural, shall have the following respective meaning:

2.1. Act refers to Republic Act No. 7942, otherwise known as the "Philippine Mining Act of 1995."

2.2. Agreement means this Mineral Production Sharing Agreement.

2.3. Associated Minerals mean other ores/minerals, which occur together with the principal ore/mineral.

2.4. Bangko Sentral means Bangko Sentral ng Pilipinas.

2.5. Budget means an estimate of expenditures to be made by Contractor in mining operations contemplated hereunder to accomplish the Work Program for each particular period.

2.6. Bureau means Mines and Geosciences Bureau.

2.7. Calendar Year or Year means a period of twelve (12) consecutive months starting with the first day of January and ending on December 31, while "Calendar Quarter" means a period of three consecutive months with the first calendar quarter starting with the first day of January.

2.8. Commercial Production means the production of sufficient quantity of minerals to sustain economic viability of mining operations reckoned from the date of commercial operation as declared by the Contractor or as stated in the feasibility study, whichever comes first.

2.9. Constitution or Philippine Constitution means the 1987 Constitution of the Republic of the Philippines adopted by the Constitutional Convention of 1986 on October 15, 1986 and ratified by the People of the Republic of the Philippines on February 2, 1987.

2.10. Contract Area means the area onshore or offshore delineated under the Mineral Production Sharing Agreement subject to the relinquishment obligations of the Contractor and properly defined by latitude and longitude or bearing and distance.

2.11. Contract Year means a period of twelve (12) consecutive months counted from the Effective Date of this Agreement or from the anniversary of such Effective Date.

2.12. Contractor means **Eramen Minerals, Incorporated** or its assignee or assignees of interest under this Agreement: Provided, That the assignment of any of such interest is accomplished pursuant to the pertinent provisions of the implementing rules and regulations of the Act.

2.13. Declaration of Mining Feasibility means a document proclaiming the presence of minerals in a specific site, which are recoverable by socially acceptable, environmentally safe and economically sound methods specified in the Mine Development Plan.

2.14. Department or DENR means the Department of Environment and Natural Resources.

2.15. Director means the Director of Mines and Geosciences Bureau.

2.16. Effective Date means the date of execution of this Agreement by the Contractor and by the Secretary on behalf of the Government.

2.17. Environment means all facets of man's surroundings: physical, ecological, aesthetic, cultural, economic, historic, institutional and social.

2.18. Exploration means searching or prospecting for mineral resources by geological, geophysical and geochemical surveys, remote sensing, test pitting, trenching, drilling, shaft sinking, tunneling or any other means for the purpose of determining the existence, extent, quality and quantity of mineral resources and the feasibility of mining them for profit.

2.19. Exploration Period shall mean the period from the Effective Date of this Agreement, which shall be for two (2) years, renewable for like periods but not to exceed a total term of six (6) years for nonmetallic minerals and eight (8) years for metallic minerals, subject to the pertinent provisions of the implementing rules and regulations of the Act.

2.20. Force Majeure means acts or circumstances beyond the reasonable control of the Contractor including, but not limited to war, rebellion, insurrection, riots, civil disturbances, blockade, sabotage, embargo, strike, lock out, any dispute with surface owners and other labor disputes, epidemics, earthquake, storm, flood or other adverse weather conditions, explosion, fire, adverse action by the Government or by any of its instrumentality or subdivision thereof, act of God or any public enemy and any cause as herein described over which the affected party has no reasonable control.

2.21. Foreign Exchange means any currency other than the currency of the Republic of the Philippines acceptable to the Government and the Contractor.

2.22. Government means the Government of the Republic of the Philippines or any of its agencies and instrumentalities.

2.23. Gross Output means the actual market value of the minerals or mineral products from each mine or mineral land operated as a separate entity, without any deduction for mining, processing, refining, transporting, handling, marketing or any other expenses: Provided, That if the minerals or mineral products are sold or consigned abroad by the Contractor under C.I.F. terms, the actual cost of ocean freight and insurance shall be

deducted: Provided further, That in the case of mineral concentrates which are not traded in commodity exchanges in the Philippines or abroad such as copper concentrate, the actual market value shall be the world price quotation of the refined mineral products contained thereof prevailing in the said commodity exchanges, after deducting the smelting, refining, treatment, insurance, transportation and other charges incurred in the process of converting mineral concentrates into refined metal traded in those commodity exchanges.

2.24. Mine Development refers to work undertaken to prepare an ore body or a mineral deposit for mining, including the construction of necessary infrastructure and related facilities.

2.25. Minerals mean all naturally occurring inorganic substances in solid, liquid, gas or any intermediate state excluding energy materials such as coal, petroleum, natural gas, radioactive materials and geothermal energy.

2.26. Mineral Products mean materials derived from mineral ores/rocks and prepared into marketable state by metallurgical processes, which include beneficiation, cyanidation, leaching, smelting, calcination and other similar processes.

2.27. Mining Area means that portion of the Contract Area identified by the Contractor as defined and delineated in a Survey Plan duly approved by the Director/Regional Director concerned for purposes of development and/or utilization and sites for support facilities.

2.28. Mining Operations means mining activities involving exploration, feasibility study, environmental impact assessment, development, utilization, mineral processing and mine rehabilitation.

2.29. Notice means notice in writing, telex or telecopy (authenticated by answer back or confirmation received) addressed or sent as provided in Section 16.2 of this Agreement.

2.30. Ore means naturally occurring substance or material from which a mineral or element can be mined and/or processed for profit.

2.31. Pollution means any alteration of the physical, chemical and/or biological properties of any water, air and/or land resources of the Philippines, or any discharge thereto of any liquid, gaseous or solid wastes or any production of unnecessary noise or any emission of objectionable odor, as will or is likely to create or render such water, air, and land resources harmful, detrimental or injurious to public health, safety or welfare or which will adversely affect their utilization for domestic, commercial, industrial, agricultural, recreational or other legitimate purposes.

2.32. Secretary means the Secretary of the Department of Environment and Natural Resources.

2.33. State means the Republic of the Philippines.

2.34. Work Program means a document which presents the plan of major mining operations and the corresponding expenditures of the Contractor in its Contract Area during a given period of time, including the plan and expenditures for development of host and neighboring communities and of local geoscience and mining technology, as submitted and approved in accordance with the implementing rules and regulations of the Act.

SECTION III

TERM OF AGREEMENT

3.1. This Agreement shall have a term of twenty five (25) years from Effective Date, and may be renewed thereafter for another term not exceeding twenty five (25) years. The renewal of this Agreement, as well as the changes in the terms and conditions thereof, shall be upon mutual consent by the parties. In the event the Government decides to allow mining operations thereafter by other Contractor, this must be through competitive public bidding. After due publication of notice, the Contractor shall have the right to equal the highest bid upon reimbursement of all reasonable expenses of the highest bidder.

SECTION IV

CONTRACT AREA

4.1. Size, Shape, and Location of Contract Area - This Agreement covers a Contract Area of approximately Four Thousand Six Hundred Nineteen and 6968/10,000 hectares (4,619.6869 has.), situated in Sta. Cruz and Candelaria, Zambales and bounded by the following geographical coordinates (please refer to ANNEX "B" - 1:50,000 scale Location Map/Sketch Plan):

Block 1
Area = 99 Has.

Corner	Latitude	Longitude
1	15° 48' 04.444"	119° 59' 19.606"
2	15° 48' 04.444"	119° 59' 59.920"
3	15° 47' 35.162"	119° 59' 59.920"
4	15° 47' 35.162"	119° 59' 29.684"
5	15° 47' 44.923"	119° 59' 29.684"
6	15° 47' 44.923"	119° 59' 19.606"

Block 2
Area = 9 Has.

Corner	Latitude	Longitude
1	15° 47' 35.162"	120° 00' 30.156"
2	15° 47' 35.162"	120° 00' 40.235"
3	15° 47' 25.401"	120° 00' 40.235"
4	15° 47' 25.401"	120° 00' 30.156"

Block 3
Area = 349.964 Has.

Corner	Latitude	Longitude
1	15° 48' 09.202"	120° 01' 43.831"
2	15° 48' 09.202"	120° 02' 41.178"
3	15° 47' 54.683"	120° 02'41.178"
4	15° 47' 54.683"	120° 02' 51.258"
5	15° 47' 44.923"	120° 02' 51.258"
6	15° 47' 44.923"	120° 03' 21.498"
7	15° 47' 54.863"	120° 03' 21.498"
8	15° 47' 54.863"	120° 03' 31.576"
9	15° 48' 04.444"	120° 03' 31.576"
10	15° 48' 04.444"	120° 03' 41.605"
11	15° 48' 14.105"	120° 03' 41.605"
12	15° 48' 14.105"	120° 03' 51.792"
13	15° 48' 04.444"	120° 03' 51.792"
14	15° 48' 04.444"	120° 04' 21.963"
15	15° 47' 54.863"	120° 04' 21.963"
16	15° 47' 54.863"	120° 04' 11.985"
17	15° 47' 45.103"	120° 04' 11.985"
18	15° 47' 45.103"	120° 04' 01.807"
19	15° 47' 35.501"	120° 04' 01.807"
20	15° 47' 35.501"	120° 03' 51.279"
21	15° 47' 25.302"	120° 03' 51.279"
22	15° 47' 25.302"	120° 03' 41.950"
23	15° 47' 23.452"	120° 03' 41.950"
24	15° 47' 23.452"	120° 02' 54.221"
25	15° 47' 33.185"	120° 02' 54.221"
26	15° 47' 33.185"	120° 02' 34.168"
27	15° 47' 42.954"	120° 02' 34.168"
28	15° 47' 42.954"	120° 02' 24.601"
29	15° 47' 52.505"	120° 02' 24.601"
30	15° 47' 52.505"	120° 01' 50.582"
31	15° 47' 52.505"	120° 01' 43.831"

Block 4
Area = 108.794 Has.

Corner	Latitude	Longitude
1	15° 47' 15.641"	120° 03' 44.717"
2	15° 47' 15.641"	120° 04' 01.807"
3	15° 47' 25.402"	120° 04' 01.807"
4	15° 47' 25.402"	120° 04' 11.885"
5	15° 47' 35.162"	120° 04' 11.885"
6	15° 47' 35.162"	120° 04' 21.963"
7	15° 46' 56.120"	120° 04' 21.963"
8	15° 46' 56.120"	120° 04' 01.807"
9	15° 46' 46.359"	120° 04' 01.807"
10	15° 46' 46.359"	120° 03' 44.717"

Block 5
Area = 1,609.39 Has.

Corner	Latitude	Longitude
1	15° 44' 25.317"	119° 58' 27.110"
2	15° 44' 25.317"	119° 58' 47.217"
3	15° 44' 29.790"	119° 58' 47.217"
4	15° 44' 29.790"	120° 00' 30.687"
5	15° 46' 29.790"	120° 00' 30.687"
6	15° 46' 29.790"	120° 00' 30.156"
7	15° 46' 36.799"	120° 00' 30.156"
8	15° 46' 36.799"	120° 00' 20.077"
9	15° 46' 56.120"	120° 00' 20.077"
10	15° 46' 56.120"	120° 00' 30,156"
11	15° 47' 05.981"	120° 00' 30.156"
12	15° 47' 05.981"	120° 00' 40.235"
13	15° 46' 56.126"	120° 00' 40.235"
14	15° 46' 56.126"	120° 00' 50.314"
15	15° 47' 03.903"	120° 00' 50.314"
16	15° 47' 03.903"	120° 01' 00.323"
17	15° 46' 56.120"	120° 01' 00.323"
18	15° 46' 56.120"	120° 01' 20.550"
19	15° 47' 03.903"	120° 01' 20.550"
20	15° 47' 03.903"	120° 01' 50.786"
21	15° 46' 57.863"	120° 01' 50.786"
22	15° 46' 57.863"	120° 01' 24.220"
23	15° 46' 47.010"	120° 01' 24.220"
24	15° 46' 47.010"	120° 01' 20.550"
25	15° 46' 17.083"	120° 01' 20.550"
26	15° 46' 17.083"	120° 01' 24.220"
27	15° 45' 57.563"	120° 01' 24.220"
28	15° 45' 57.563"	120° 01' 40.710"
29	15° 45' 57.563"	120° 02' 00.867"
30	15° 45' 48.369"	120° 02' 00.867"

31	15° 45' 48.369"	120° 01' 53.540"
32	15° 45' 47.799"	120° 01' 53.540"
33	15° 45' 47.799"	120° 01' 50.788"
34	15° 45' 30.000"	120° 01' 50.788"
35	15° 45' 30.000"	120° 01' 30.000"
36	15° 43' 50.672"	120° 01' 30.000"
37	15° 43' 50.672"	120° 01' 18.448"
38	15° 43' 46.277"	120° 01' 18.448"
39	15° 43' 46.277"	120° 00' 58.291"
40	15° 43' 26.756"	120° 00' 58.291"
41	15° 43' 26.756"	120° 00' 38.134"
42	15° 43' 46.277"	120° 00' 38.134"
43	15° 43' 46.277"	119° 59' 27.584"
44	15° 43' 36.516"	119° 59' 27.584"
45	15° 43' 36.516"	119° 59' 17.505"
46	15° 43' 46.277"	119° 59' 17.505"
47	15° 43' 46.277"	119° 58' 57.348"
48	15° 43' 36.516"	119° 58' 57.348"
49	15° 43' 36.516"	119° 58' 47.269"
50	15° 43' 46.277"	119° 58' 47.269"
51	15° 43' 46.277"	119° 58' 37.190"
52	15° 44'15.559"	119° 58' 37.190"
53	15° 44'15.559"	119° 58' 27.110"

Block 6

Area = 162.053 Has.

Corner	Latitude	Longitude
1	15° 46' 02.192"	119° 57' 56.874"
2	15° 46' 02.192"	119° 58' 17.032"
3	15° 45' 33.641"	119° 58' 17.032"
4	15° 45' 33.641"	119° 58' 27.110"
5	15° 44' 35.078"	119° 58' 27.110"
6	15° 44' 35.078"	119° 58' 17.032"
7	15° 44' 54.599"	119° 58' 17.032"
8	15° 44' 54.599"	119° 58' 06.954"
9	15° 45' 14.120"	119° 58' 06.954"
10	15° 45' 14.120"	119° 57' 56.874"

Block 7

Area = 2,240.042 Has.

Corner	Latitude	Longitude
1	15° 42' 33.402"	119° 58' 43.586"
2	15° 42' 33.402"	119° 59' 03.743"
3	15° 42' 23.642"	119° 59' 03.743"
4	15° 42' 23.642"	119° 59' 13.822"
5	15° 42' 13.881"	119° 59' 13.822"
6	15° 42' 13.881"	119° 59' 23.900"
7	15° 42' 04.121"	119° 59' 23.900"

8	15° 42' 04.121"	119° 59' 33.979"
9	15° 41' 54.200"	119° 59' 33.979"
10	15° 41' 54.200"	119° 59' 44.057"
11	15° 42' 04.121"	119° 59' 44.057"
12	15° 42' 04.121"	119° 59' 54.136"
13	15° 42' 13.881"	119° 59' 54.136"
14	15° 42' 13.881"	119° 59' 44.057"
15	15° 42' 23.642"	119° 59' 44.057"
16	15° 42' 23.642"	119° 59' 33.979"
17	15° 42' 33.402"	119° 59' 33.979"
18	15° 42' 33.402"	119° 59' 23.900"
19	15° 43' 31.966"	119° 59' 23.900"
20	15° 43' 31.966"	120° 00' 34.350"
21	15° 43' 22.205"	120° 00' 34.350"
22	15° 43' 22.205"	120° 01' 04.686"
23	15° 43' 46.275"	120° 01' 04.686"
24	15° 43' 46.275"	120° 01' 18.447"
25	15° 43' 50.670"	120° 01' 18.447"
26	15° 43' 50.670"	120° 01' 34.922"
27	15° 43' 41.726"	120° 01' 34.922"
28	15° 43' 41.726"	120° 01' 55.079"
29	15° 43' 12.445"	120° 01' 55.079"
30	15° 43' 12.445"	120° 02' 05.158"
31	15° 43' 02.684"	120° 02' 05.158"
32	15° 43' 02.684"	120° 01' 55.079"
33	15° 42' 43.163"	120° 01' 55.079"
34	15° 42' 43.163"	120° 01' 45.001"
35	15° 41' 54.360"	120° 01' 45.001"
36	15° 41' 54.360"	120° 01' 34.922"
37	15° 41' 25.079"	120° 01' 34.922"
38	15° 41' 25.079"	1200 01' 45.001"
39	15° 41' 44.600"	120° 01' 45.001"
40	15° 41'44.600"	120° 01' 55.079"
41	15° 41' 25.079"	120° 01' 55.079"
42	15° 41' 25.079"	120° 02' 15.237"
43	15° 41'44.600"	120° 02' 15.237"
44	15° 41'44.600"	120° 02' 25.315"
45	15° 41' 54.360"	120° 02' 25.315"
46	15° 41' 54.360"	120° 02' 05.158"
47	15° 42' 04.121"	120° 02' 05.158"
48	15° 42' 04.121"	120° 02' 15.237"
49	15° 42' 23.642"	120° 02' 15.237"
50	15° 42' 23.642"	120° 02' 45.470"
51	15° 42' 43.163"	120° 02' 45.470"
52	15° 42' 43.163"	120° 02' 55.548"
53	15° 42' 04.121"	120° 02' 55.548"
54	15° 42' 04.121"	120° 02' 45.470"
55	15° 41' 44.600"	120° 02' 45.470"

56	15° 41'44.600"	120° 02' 35.394"
57	15° 41' 25.079"	120° 02' 35.394"
58	15° 41' 25.079"	120° 02' 25.601"
59	15° 41' 05.557"	120° 02' 25.601"
60	15° 41' 05.557"	120° 02' 05.158"
61	15° 40' 55.797"	120° 02' 05.158"
62	15° 40' 55.797"	120° 01' 24.844"
63	15° 40' 46.036"	120° 01' 24.844"
64	15° 40' 46.036"	120° 00' 24.372"
65	15° 41' 05.557"	120° 00' 24.372"
66	15° 41' 05.557"	120° 00' 34.350"
67	15° 41' 15.318"	120° 00' 34.350"
68	15° 41' 15.318"	120° 00' 24.372"
69	15° 41' 25.079"	120° 00' 24.372"
70	15° 41' 25.079"	120° 00' 04.215"
71	15° 41' 15.318"	120° 00' 04.215"
72	15° 41' 15.318"	120° 00' 00.000"
73	15° 41' 30.000"	120° 00' 00.000"
74	15° 41' 30.000"	119° 59' 30.000"
75	15° 42' 00.000"	119° 59' 30.000"
76	15° 42' 00.000"	119° 59' 13.822"
77	15° 42' 04.121"	119° 59' 13.822"
78	15° 42' 04.121"	119° 59' 03.743"
79	15° 42' 13.881"	119° 59' 03.743"
80	15° 42' 13.881"	119° 58' 43.586"

Block 8

Area = 36.7102 Has.

Corner	Latitude	Longitude
1	15° 45' 38.037"	120° 01' 50.786"
2	15° 45' 47.804"	120° 01' 50.786"
3	15° 45' 47.804"	120° 01' 53.540"
4	15° 45' 38.606"	120° 01' 53.540"
5	15° 45' 38.606"	120° 02' 03.761"
6	15° 45' 47.799"	120° 02' 03.761"
7	15° 45' 47.799"	120° 02' 10.944"
8	15° 45' 57.563"	120° 02' 10.944"
9	15° 45' 57.563"	120° 02' 13.841"
10	15° 45' 48.369"	120° 02' 13.841"
11	15° 45' 48.369"	120° 02' 23.921"
12	15° 45' 57.563"	120° 02' 23.921"
13	15° 45' 57.563"	120° 02' 30.970"
14	15° 45' 38.070"	120° 02' 30.970"

BR

Block 9
Area = 7.9248 Has.

Corner	Latitude	Longitude
1	15° 46' 47.010"	120° 01' 24.220"
2	15° 46' 47.010"	120° 01' 20.550"
3	15° 46' 17.083"	120° 01' 20.550"
4	15° 46' 17.083"	120° 01' 24.220"

The Contractor is not allowed to undertake any mining activities within the portion of the Contract Area covered by any DENR Project Areas, without the prior consent of the contractor(s)/concessionaire(s) concerned.

Any portion(s) of the Contract Area that may be found and verified as old growth and/or mossy forests shall be automatically excised from said Contract Area.

SECTION V

EXPLORATION PERIOD

5.1. Timetable for Exploration - The Contractor shall commence Exploration activities not later than three (3) months after the Effective Date for a period of two (2) years, renewable for like periods but not to exceed a total term of six (6) years for nonmetallic minerals and eight (8) years for metallic minerals, subject to annual review and approval by the Director in accordance with the implementing rules and regulations of the Act.

5.2. Renewal of Exploration Period - In case the Contractor opts for a renewal of its Exploration Period, it shall file prior to the expiration thereof, a renewal application in the Regional Office concerned, accompanied by the mandatory requirements stipulated in the implementing rules and regulations of the Act. The Director may grant the renewal of the Exploration Period on condition that the Contractor has substantially complied with the terms and conditions of the Agreement.

In cases where further exploration is warranted beyond the six (6)- or eight (8)-year period and on condition that the Contractor has substantially implemented the Exploration and Environmental Work Programs as verified by the Bureau, the Director may further grant renewal of the Exploration Period: Provided, That the Contractor shall be required to set up a performance surety equivalent to the expenditure requirement of the Exploration and Environmental Work Programs.

5.3. Work Programs and Budgets - The Contractor shall strictly comply with the approved Exploration and Environmental Work Programs together with their corresponding Budgets (please refer to ANNEXES "C" and "D"). The amount to be spent by the Contractor in conducting Exploration activities under the terms of this Agreement during the Exploration Period

5.7. Survey of the Contract Area - The Contractor shall cause the survey of the perimeter of the Contract Area/final Mining Area through an application for survey, complete with requirements, filed in the Regional Office concerned simultaneous with the submission of the Declaration of Mining Feasibility. Survey returns shall be submitted to the Regional Director concerned for approval within one (1) year from receipt of the Order of Survey complete with the mandatory requirements stated in the implementing rules and regulations of the Act.

5.8. Reporting

a. During the Exploration Period, the Contractor shall submit to the Director, through the Regional Director concerned, quarterly and annual accomplishment reports under oath on all activities conducted in the Contract Area from the Effective Date of this Agreement. The quarterly report shall be submitted not later than fifteen (15) days at the end of each Calendar Quarter while the annual accomplishment report shall be submitted not later than thirty (30) days from the end of each Calendar Year. Such information shall include detailed financial expenditures, raw and processed geological, geochemical, geophysical and radiometric data plotted on a map at a minimum 1:50,000 scale, copies of originals of assay results, duplicated samples, field data, copies of originals from drilling reports, maps, environmental work program implementation and detailed expenditures showing discrepancies/ deviations with approved exploration and environmental plans and budgets as well as all other information of any kind collected during the exploration activities. All information submitted to the Bureau shall be subject to the confidentiality clause of this Agreement.

b. Final Report - The Contractor shall submit to the Director, through the Regional Director concerned, a final report under oath upon the expiration of the Exploration Period which shall be in the form and substance comparable to published professional reports of respectable international institutions and shall incorporate all the findings in the Contract Area including location of samples, assays, chemical analysis, and assessment of mineral potentials together with a geologic map of 1:50,000 scale at the minimum showing the results of the exploration. Such report shall also include detailed expenditures incurred during the Exploration Period. In case of diamond drilling, the Contractor shall, upon request of the Director/Regional Director concerned, submit to the Regional Office a quarter of the core samples, which shall be deposited in the Regional Office Core Library for safekeeping and reference.

c. Relinquishment Report - The Contractor shall submit a separate relinquishment report with a detailed geologic report of the relinquished area accompanied by maps at a scale of 1:50,000 and results of analyses and detailed expenditures, among others.

SECTION VI

DEVELOPMENT AND CONSTRUCTION PERIOD

6.1. Timetable - The Contractor shall complete the development of the mine including the construction of production facilities within thirty six (36) months from the submission of the Declaration of Mining Feasibility, subject to such extension based on justifiable reasons as the Director may approve, upon recommendation of the Regional Director concerned.

6.2. Reporting

a. Annual - The Contractor shall submit, within sixty (60) days after December 31 of each year, to the Director, through the Regional Director concerned, an annual report, which states the major activities, achievements and detailed expenditures during the year covered, including maps, assays, rock and mineral analyses and geological and environmental progress reports during the Development and Construction Period.

b. Final Report - Within six (6) months from the completion of the development and construction activities, the Contractor shall submit a final report to the Director, through the Regional Director concerned. Such report shall integrate all information in maps of appropriate scale and quality, as well as in monographs or reports in accordance with international standards.

SECTION VII

OPERATING PERIOD

7.1. Timetable - The Contractor shall submit, within thirty (30) days before completion of mine development and construction of production facilities, to the Director, through the Regional Director concerned, a Three-Year Commercial Operation Work Program. The Contractor shall commence commercial utilization immediately upon approval of the aforesaid Work Program. Failure of the Contractor to commence Commercial Production within the period shall be considered a substantial breach of the Agreement.

7.2. Commercial Operation Work Program and Budget - During the Operating Period, the Contractor shall submit to the Director, through the Regional Director concerned, Work Programs and Budgets covering a period of three (3) years each, which shall be submitted not later than thirty (30) days before the expiration of the period covered by the previous Work Program.

The Contractor shall conduct Mining Operations and other activities for the duration of the Operating Period in accordance with the duly approved

Work Programs and corresponding Budgets.

7.3. Expansion and Modification of Facilities - The Contractor may make expansions, modifications, improvements, and replacements of the mining facilities and may add new facilities as the Contractor may consider necessary for the operations: Provided, That such plans shall be embodied in an appropriate Work Program approved by the Director.

7.4. Reporting

a. Quarterly Reports - Beginning with the first Calendar Quarter following the commencement of the Operating Period, the Contractor shall submit, within thirty (30) days after the end of each Calendar Quarter, to the Director, through the Regional Director concerned, a Quarterly Report stating the tonnage of production in terms of ores, concentrates, and their corresponding grades and other types of products; value, destination of sales or exports and to whom sold; terms of sales and expenditures.

b. Annual Reports - During the Operating Period, the Contractor shall submit within sixty (60) days from the end of each Calendar Year, to the Director, through the Regional Director concerned, an Annual Report indicating in sufficient detail:

b.1. The total tonnage of ore reserves, whether proven, probable, or inferred, the total tonnage of ores, kind by kind, broken down between tonnage mined, tonnages transported from the minesite and their corresponding destination, tonnages stockpiled in the mine and elsewhere in the Philippines, tonnages sold or committed for export (whether actually shipped from the Philippines or not), tonnages actually shipped from the Philippines (with full details as to purchaser, destination and terms of sale), and if known to the Contractor, tonnages refined, processed or manufactured in the Philippines with full specifications as to the intermediate products, by-products or final products and of the terms at which they were disposed;

b.2. Work accomplished and work in progress at the end of the year in question with respect to all the installations and facilities related to the utilization program, including the investment actually made or committed; and

b.3. Profile of work force, including management and staff, stating particularly their nationalities, and for Filipinos, their place of origin (i.e., barangay, town, province, region).

The Contractor shall also comply with other reporting requirements provided for in the implementing rules and regulations of the Act.

SECTION VIII

FISCAL REGIME

8.1. General Principle - The fiscal regime of this Agreement shall be governed by the principle according to which the Government expects a reasonable return in economic value for the utilization of non-renewable mineral resources under its national sovereignty while the Contractor expects a reasonable return on its investment with special account to be taken for the high risk of exploration, the terms and conditions prevailing elsewhere in the industry and any special efficiency to be gained by a particularly good performance of the Contractor.

8.2. Registration Fees - Within fifteen (15) days upon receipt of the notice of approval of the Agreement from the Regional Office concerned, the Contractor shall cause the registration of this Agreement with the said Regional Office and pay the registration fee at the rate provided in the existing rules and regulations. Failure of the Contractor to cause the registration of this Agreement within the prescribed period shall be sufficient ground for cancellation of the same.

8.3. Occupation Fees - Prior to registration of this Agreement and at the same date every year thereafter, the Contractor shall pay to the Municipal/City Treasurer concerned an occupation fee over the Contract Area at the annual rate provided in the existing rules and regulations. If the fee is not paid on the date specified, the Contractor shall pay a surcharge of twenty five percent (25%) of the amount due in addition to the occupation fees.

8.4. Share of the Government - The Government Share shall be the excise tax on mineral products at the time of removal and at the rate provided for in Republic Act No. 7729 amending Section 151 (a) of the National Internal Revenue Code, as amended as well as other taxes, duties and fees levied by existing laws.

For purposes of determining the amount of the herein Government Share, the Contractor shall strictly comply with the auditing and accounting requirements prescribed under existing laws and regulations.

The Government Share shall be allocated in accordance with Sections 290 and 292 of Republic Act No. 7160, otherwise known as "The Local Government Code of 1991."

8.5. Pricing of Sales - The Contractor shall endeavor to obtain the best achievable price for its production and pay the lowest achievable marketing commissions and related fees. It shall seek to strike a balance between long-term sales comparable to policies followed by independent producers in the international mining industry.

The Contractor shall likewise seek a balanced distribution among consumers. Insofar as sales to Contractor's affiliates are concerned,

prices shall be at arm's length standard and competing offers for large scale and long-term contracts shall be procured. Before any sale and/or shipment of mineral product is made, existing and future marketing contract(s)/sales agreement(s) shall be submitted to the Director, copy furnished the Regional Director concerned, for registration. At the same time, the Contractor shall regularly inform in writing of any revisions, changes or additions in said contract(s)/agreement(s).

The Contractor shall reflect in its Monthly/Quarterly Report on Production, Sales and Inventory of Minerals, as well as in the Integrated Annual Report, the corresponding registration number(s) of the marketing contract(s)/agreement(s) governing the export or sale of minerals.

8.6. Associated Minerals - If minerals other than nickel, cobalt, chromite are discovered in commercial quantities in the Contract Area, the value thereof shall be added to the value of the principal mineral in computing the Government share.

SECTION IX

WORK PROGRAMS

9.1. Submission to Government - Within the periods stated herein, the Contractor shall prepare and submit to the Director, through the Regional Director concerned, a Work Program and corresponding Budget for the Contract Area stating the Mining Operations and expenditures which the Contractor proposes to carry out during the period covered with the details and particulars set forth elsewhere in this Agreement or in the supporting documents.

9.2. Government's Examination and Revision of Work Program - Should the Government decide to propose a revision to a certain specific feature in the Work Program or Budget, it shall, within thirty (30) days after receipt thereof, provide a Notice to the Contractor specifying in reasonable detail its reasons therefore. Promptly thereafter, the Government and Contractor will meet and endeavor to agree on the revision proposed by the Government. In any event, the revision of any portion of said Work Program or Budget in which the Government shall fail to notify the Contractor of the proposed revision shall, insofar as possible, be carried out as prescribed herein. If the Government should fail within sixty (60) days from receipt thereof to notify Contractor of the proposed revisions, the Work Program and Budget proposed by the Contractor shall be deemed to be approved.

9.3. Contractor's Changes to Work Program - It is recognized by the Government and the Contractor that the details of any Work Program may require changes in the light of changing circumstances. The Contractor may make such changes: Provided, That it shall not change the general objective of the Work Program: Provided further, That changes which entail a variance of at least twenty percent (20%) shall be subject to the

approval of the Director.

9.4. The Government's approval of a proposed Work Program and Budget will not be unreasonably withheld.

SECTION X

ENVIRONMENTAL PROTECTION AND MINE SAFETY AND HEALTH

10.1. The Contractor shall manage its Mining Operations in a technically, financially, socially, culturally and environmentally responsible manner to achieve the sustainable development objectives and responsibilities as provided for under the implementing rules and regulations of the Act.

10.2. The Contractor shall ensure that the standards of environmental protection are met in the course of the Mining Operation. To the extent possible, control of pollution and the transformation of the mined-out areas or materials into economically and socially productive forms must be done simultaneously with mining.

10.3. The Contractor shall submit an Environmental Work Program during the Exploration Period as prescribed in the implementing rules and regulations of the Act.

10.4. An Environmental Compliance Certificate (ECC) shall be secured first by the Contractor prior to the conduct of any development works, construction of production facilities and/or mine production activities in the Contract Area.

10.5. The Contractor shall submit within thirty (30) calendar days after the issuance and receipt of the ECC, an Environmental Protection and Enhancement Program (EPEP) using MGB Form No. 16-2 covering all areas to be affected by development, utilization and processing activities under this Agreement. The Contractor shall allocate for its initial environment-related capital expenditures approximately ten percent (10%) of the total project cost or in such amount depending on the environmental/geological condition, nature and scale of operations and technology to be employed in the Contract Area.

10.6. The Contractor shall submit, within thirty (30) days prior to the beginning of every calendar year, an Annual Environmental Protection and Enhancement Program (AEPEP), using MGB Form 16-3, which shall be based on the approved EPEP. The AEPEP shall be implemented during the year for which it was submitted. To implement its AEPEP, the Contractor shall allocate annually three to five percent (3%-5%) of its direct mining and milling costs depending on the environmental/geologic condition, nature and scale of operations and technology employed in the Contract Area.

10.7. The Contractor shall establish a Contingent Liability and Rehabilitation Fund (CLRF) which shall be in the form of the Mine Rehabilitation Fund (MRF) and the Mine Waste and Tailings Fee (MWTF).

The MRF shall be based on the financial requirements of the approved EPEP as a reasonable environmental deposit to ensure satisfactory compliance with the commitments/strategies of the EPEP/AEPEP and availability of funds for the performance of the EPEP/AEPEP during the specific project phase. The MRF shall be deposited as Trust Fund in a government depository bank and shall be used for physical and social rehabilitation of areas affected by mining activities and for research on the social, technical and preventive aspects of rehabilitation.

The MWTF shall be collected based on the amounts of mine waste and mill tailings generated during the conduct of Mining Operations. The MWTF collected shall accrue to a Mine Waste and Tailings Reserve Fund and shall be deposited in a government depository bank for payment of compensation for damages caused by the Mining Operations.

10.8. The Contractor shall set up mitigating measures such as mine waste and mill tailings disposal system, mine rehabilitation or plan, water quality monitoring, etc. to minimize land degradation, air and water pollution, acid rock drainage and changes in hydrogeology.

10.9. The Contractor shall set up an Environmental and Safety Office at its minesite manned by qualified personnel to plan, implement and monitor its approved EPEP.

10.10. The Contractor shall be responsible in the monitoring of environmental, safety and health conditions in the Contract Area and shall strictly comply with all the rules and regulations embodied under DAO No. 2000-98, otherwise known as the "Mine Safety and Health Standards."

10.11. The Contractor shall be responsible for the submission of a final mine rehabilitation and/or decommissioning plans, including its financial requirements and incorporating the details and particulars set forth in the implementing rules and regulations of the Act.

SECTION XI

RIGHTS AND OBLIGATIONS OF THE PARTIES

11.1. Obligations of the Contractor:

a. To exclusively conduct sustainable Mining Operations within the Contract Area in accordance with the provisions of the Act and its implementing rules and regulations;

b. To construct and operate any facilities specified under the Mineral Agreement or approved Work Program;

c. To determine the exploration, mining and treatment process to be utilized in the Mining Operations;

d. To extract, remove, use and dispose of any tailings as authorized by an approved Work Program;

e. To secure all permits necessary or desirable for the purpose of Mining Operations;

f. To keep accurate technical records about the Mining Operations, as well as financial and marketing accounts, and make them available to Government representatives authorized by the Director for the purpose of assessing the performance and compliance of the Contractor with the terms of this Agreement. Authorized representatives of other Government Agencies may also have access to such accounts in accordance with existing laws, rules and regulations;

g. To furnish the Bureau all the data and information gathered from the Contract Area and that all the books of accounts and records shall be open for inspection;

h. To allow access to Government during reasonable hours in inspecting the Contract Area and examining pertinent records for purposes of monitoring compliance with the terms of this Agreement;

i. To hold the Government free and harmless from all claims and accounts of all kinds, as well as demands and actions arising out of the accidents or injuries to persons or properties caused by Mining Operations of the Contractor and indemnify the Government for any expenses or costs incurred by the Government by reason of any such claims, accounts, demands or actions;

j. In the development of the community:

j.1. To recognize and respect the rights, customs and traditions of indigenous cultural communities over their ancestral lands and to allocate royalty payment of not less than one percent (1%) of the value of the gross output of minerals sold;

j.2. To coordinate with proper authorities in the development of the mining community and for those living in the host and neighboring communities through social infrastructure, livelihood programs, education, water, electricity and medical services. Where traditional self-sustaining income and the community activities are identified to be present, the Contractor shall assist in the preservation and/or enhancement of such activities;

j.3. To allot annually a minimum of one percent (1%) of the direct mining and milling costs necessary to implement the activities undertaken in the development of the host and neighboring communities. Expenses for community development may be charged against the royalty payment of at least one percent (1%) of the gross output intended for the concerned indigenous cultural community;

j.4. To give preference to Filipino citizens who have established domicile in the neighboring communities, in the hiring of personnel for its mining operations. If necessary skills and expertise are currently not available, the Contractor must immediately prepare and undertake a training and recruitment program at its expense; and

j.5. To incorporate in the Mining Feasibility Study the planned expenditures necessary to implement (j.1) to (j.3) of this Section;

k. In the development of Mining Technology and Geosciences:

k.1. In the course of its operations, to produce geological, geophysical, geochemical and other types of maps and reports that are appropriate in scale and in format and substance which are consistent with the internationally accepted standards and practices. Such maps shall be made available to the scientific community in the most convenient and cost effective forms, subject to the condition that the Contractor may delay release of said information for a reasonable period of time which shall not exceed three (3) years;

k.2. To systematically keep the data generated from the Contract/ Mining Area such as cores, assays and other related information, including economic and financial data and make them accessible to students, researchers and other persons responsible for developing mining, geoscience and processing technology subject to the condition that the Contractor may delay release of data to the science and technology community within a reasonable period of time which shall not exceed three (3) years;

k.3. To transfer to the Government or local mining company the appropriate technology it may adapt in the exploration, development and commercial utilization of the minerals in the Contract Area;

training understudies shall be undertaken. The alien employment shall be limited to technologies requiring highly specialized training and experience subject to the required approval under existing laws, rules and regulations;

f. To enjoy easement rights and use of timber, water and other natural resources in the Contract Area subject to pertinent laws, rules and regulations and the rights of third parties;

g. Repatriation of capital and remittance of profits, dividends and interest on loans, subject to existing laws and Bangko Sentral ng Pilipinas rules and regulations; and

h. To import when necessary all equipment, spare parts and raw materials required in the operations in accordance with existing laws and regulations.

11.3. Obligations of the Government:

a. To ensure that the Contractor has the Government's full cooperation in the exercise of the rights granted to it under this Agreement;

b. To use its best efforts to ensure the timely issuance of necessary permits and similar authorizing documents for use of the surface of the Contract Area; and

c. To cooperate with the Contractor in its efforts to obtain financing contemplated herein from banks or other financial institutions: Provided, That such financing arrangements will in no event reduce the Contractor's obligation on Government rights hereunder.

SECTION XII

ASSETS AND EQUIPMENT

12.1. The Contractor shall acquire for the Mining Operations only such assets that are reasonably estimated to be required in carrying out such Mining Operations.

12.2. All materials, equipment, plant and other installations of a movable nature erected or placed on the Contract Area by the Contractor shall remain the property of the Contractor. The Contractor shall have the right to remove and re-export such materials and equipment, plant and other installations from the Philippines, subject to existing rules and regulations. In case of cessation of Mining Operations on public lands occasioned by its voluntary abandonment or withdrawal, the Contractor shall have a period of one (1)

year from the time of cessation within which to remove its improvements; otherwise, all social infrastructures and facilities shall be turned over or donated tax free to the proper government authorities, national or local, to ensure that said infrastructures and facilities are continuously maintained and utilized by the host and neighboring communities.

SECTION XIII

EMPLOYMENT AND TRAINING OF PHILIPPINE PERSONNEL

13.1. The Contractor agrees to employ, to the extent possible, qualified Filipino personnel in all types of mining operations for which they are qualified; and after Commercial Production commences shall, in consultation and with consent of the Government, prepare and undertake an extensive training programme suitable to Filipino nationals in all levels of employment. The objective of said programme shall be to reach within the timetable set forth below the following targets of "Filipinization:"

	Unskilled (%)	Skilled (%)	Clerical (%)	Professional (%)	Management (%)
Year 1	100	100	100	70	70
Year 3	100	100	100	80	80
Year 5	100	100	100	90	90
Year 7	100	100	100	100	95
Year 10	100	100	100	100	95
Year 15	100	100	100	100	95

13.2. Cost and expenses of training such Filipino personnel and the Contractor's own employees shall be included in the Operating Expenses.

13.3. The Contractor shall not discriminate on the basis of gender and shall respect the right of women workers to participate in policy and decision-making processes affecting their rights and benefits.

SECTION XIV

ARBITRATION

14.1. The Government and the Contractor shall consult with each other in good faith and shall exhaust all available remedies to settle any and all disputes or disagreements arising out of or relating to the validity, interpretations, enforceability, or performance of this Agreement before resorting to arbitration as provided for in Section 14.2. below.

14.2. Any disagreement or dispute which can not be settled amicably within a period of one (1) year from the time the issue is raised by a Party shall be settled by a tribunal of three (3) arbitrators. This tribunal shall be constituted as follows: one to be appointed by the Contractor and the other to be appointed by the Secretary. The first two appointed arbitrators shall consider names of qualified persons until agreement on a mutually acceptable Chairman of the tribunal is selected. Such arbitration shall be initiated and conducted pursuant to Republic Act No. 876, otherwise known as the "Arbitration Act."

In any event, the arbitration shall be conducted applying the substantive laws of the Republic of the Philippines.

14.3. Each party shall pay fifty percent (50%) of the fees and expenses of the Arbitrators and the costs of arbitration. Each party shall pay its own costs and attorney's fee.

SECTION XV

SUSPENSION OR TERMINATION OF CONTRACT, TAX INCENTIVES AND CREDITS

15.1. This Agreement may be suspended for failure of the Contractor: (a) to comply with any provision or requirement of the Act and/or its implementing rules and regulations; (b) to pay taxes, fees and/or other charges demandable and due the Government.

15.2. This Agreement terminates or may be terminated for the following causes: (a) expiration of its term, whether original or renewal; (b) withdrawal from the Agreement by the Contractor; (c) violation by the Contractor of the Agreement's terms and conditions; (d) failure to pay taxes, fees/or charges or financial obligations for two (2) consecutive years; (e) false statement or omission of facts by the Contractor; and (f) any other cause or reason provided under the Act and its implementing rules and regulations, or any other relevant laws and regulations.

15.3. All statements made in this Agreement shall be considered as conditions and essential parts hereof, and any falsehood in said statements or omission of facts, which may alter, change or affect substantially the fact set forth in said statements shall be a ground for its revocation and termination.

15.4. The Contractor may, by giving due notice at any time during the term of this Agreement, apply for its cancellation due to causes which, in the opinion of the Contractor, render continued mining operation no longer feasible or viable. In this case, the Secretary shall decide on the application within thirty (30) days from notice: Provided, That the Contractor has met all the financial, fiscal and legal obligations.

15.5. No delay or omissions or course of dealing by the Government shall impair any of its rights under this Agreement, except in the case of a written waiver. The Government's right to seek recourse and relief by all other means shall not be construed as a waiver of any succeeding or other default unless the contrary intention is reduced in writing and signed by the party authorized to exercise the waiver.

15.6. In case of termination, the Contractor shall pay all the fees and other liabilities due up to the end of the year in which the termination becomes effective. The Contractor shall immediately carry out the restoration of the Contract Area in accordance with good mining industry practice.

15.7. The withdrawal by the Contractor from the Mineral Agreement shall not release it from any and all financial, environmental, legal and fiscal obligations under this Agreement.

15.8. The following acts or omission, *inter alia* shall constitute breach of contract, upon which the Government may exercise its right to terminate the Agreement:

a. Failure of the Contractor without valid reason to commence Commercial Production within the period prescribed; and/or

b. Failure of the Contractor to conduct mining operations and other activities in accordance with the approved Work Programs and/or any modification thereof as approved by the Director.

15.9. The Government may suspend and cancel tax incentives and credits if the Contractor fails to abide by the terms and conditions of said incentives and credits.

SECTION XVI

OTHER PROVISIONS

16.1. Any terms and conditions resulting from repeal or amendment of any existing laws or regulation or from the enactment of a law, regulation or administrative order shall be considered a part of this Agreement.

16.2. Notice

All notices, demands and other communications required or permitted hereunder shall be made in writing, telex or telecopy and shall be deemed to have been duly given notice, in the case of telex or telecopy, if answered back or confirmation received, or if delivered by hand, upon receipt or ten days after being deposited in the mail, airmail postage prepaid and addressed as follows:

If to the Government:

The Secretary
Department of Environment and Natural Resources
DENR Building, Visayas Avenue
Diliman, Quezon City

If to the Contractor:

The President
Eramen Minerals, Inc.
3rd Floor, ALPAP I Building
No. 140 Leviste Street
Salcedo Village, Makati City

Either party may substitute or change such address on notice thereof to the other party.

16.3. Governing Law

This Agreement and the relation between the parties hereto shall be governed by and construed in accordance with the laws of the Republic of the Philippines. The Contractor hereby agrees and obliges itself to comply with the provisions of the Act, its implementing rules and regulations and other relevant laws and regulations.

16.4. Suspension of Obligation

a. Any failure or delay on the part of any party in the performance of its obligation or duties hereunder shall be excused to the extent attributable to *Force Majeure* as defined in the Act: Provided, That the suspension of Mining Operations due to *Force Majeure* causes shall be subject to approval by the Director.

b. If Mining Operations are delayed, curtailed or prevented by such *Force Majeure* causes, then the time for enjoying the rights and carrying out the obligations thereby affected, the term of this Agreement and all rights and obligations hereunder shall be extended for a period equal to the period involved.

c. The Party, whose ability to perform its obligations is affected by such *Force Majeure* causes, shall promptly give Notice to the other in writing of any such delay or failure of performance, the expected duration thereof and its anticipated effect and shall use its efforts to remedy such delay, except that neither Party shall be under any obligation to settle a labor dispute: Provided, That the suspension of obligation by the Contractor shall be subject to prior approval by the Director.

ACKNOWLEDGMENT

Republic of the Philippines)
Quezon City) s s

Before me, a Notary Public for and in the City of Quezon, personally appeared **MICHAEL T. DEFENSOR**, with Community Tax Certificate No. 15453147 issued on January 5, 2005 at Quezon City, in his capacity as Secretary of the Department of Environment and Natural Resources, and **ENRIQUE C. FERNANDEZ** with Community Tax Certificate No. 13980829 issued on January 26, 2005 at Manila, in their capacity as President of Eramen Minerals, Incorporated, both known to me and to be the same persons who executed the foregoing instrument consisting of thirty (30) pages, including this acknowledgment page, and acknowledged to me that the same is their voluntary acts and deeds.

IN WITNESS WHEREOF, I have hereunto set my hand and affix my notarial seal, this 5 2005 day of _____.

JENNIFER T. B. VALENTON - CARREON
Notary Public
Until December 31, 20 05
IBP O.R. No. 617408; 1-7-05; Mla
PTR No. 3607645; 1-7-05; Mla
TIN No. 124035051

Doc. No. 213
Page No. 44
Book No. I
Series of 2005

C3/CompanyEramen/proforma/mpsa/Feb.4, 2005

Republic of the Philippines

JUL 0 3 2007

ECC Ref. Conn: 0505-003-2140

The President/General Manager
ERAMEN MINERALS, INC
3/F ALSAP 1 Bldg., No. 140 Leviste St
Salcedo Village, Makati City

Attention: *Mr. Enrique C. Fernandez*
President

Subject: Environmental Compliance Certificate

Dear Sir:

This refers to the Environmental Compliance Certificate (ECC) application for the proposed **Nickel Silicate and Associate Metal Ore Open Mining Project** to be located in Sta. Cruz and Candelaria, Zambales.

After satisfying the requirements of the said application and upon recommendation of the Environmental Management Bureau (EMB), this Department has decided to grant an ECC to the above-mentioned project.

With the issuance of this ECC, you are expected to implement the measures presented in the Environmental Impact Statement (EIS) Study, intended to protect and manage the project's adverse impacts on community health, welfare and the environment. Environmental considerations shall be incorporated in all phases and aspects of the project. You may proceed with project implementation after securing all the necessary permits from other pertinent government agencies. This Office will be monitoring the project periodically to ensure your compliance with stipulations cited in the attached ECC.

Please be guided accordingly.

Very truly yours,

ANGELO T. REYES
Secretary

SENRGT-011966

cc: EMB - Region III

Republic of the Philippines
Department of Environment and Natural Resources
Visayas Avenue, Diliman, Quezon City
Tel. Nos. (632) 925-80-35 to 37 / 927-15-17
925-80-41 / 925-
NCR Field Office

ENVIRONMENTAL COMPLIANCE CERTIFICATE

(Issued under Presidential Decree 1586)

0605-003-2140

THIS IS TO CERTIFY THAT PROPONENT **ERAMEN MINERALS INCORPORATED**, represented by its President ***Enrique C. Fernandez***, is granted this Environmental Compliance Certificate (ECC) for the proposed **NICKEL SILICATE AND ASSOCIATED METAL ORE OPEN MINING PROJECT** located in **STA. CRUZ AND CANDELARIA, ZAMBALES**, by the Department of Environment and Natural Resources (DENR) through the Environmental Management Bureau (EMB)

SUBJECT ONLY to the conditions and restrictions set-out in this Certificate and in the attached document labeled as Annex A

PROJECT DESCRIPTION

The Certificate covers the proposed Nickel Silicate and Associated Metal Ore Open Mining Project to be located within the contract area of 4,619.6869 hectares at blocks 5 and 7 in Sta. Cruz and Candelaria, Zambales as stated in the Mineral Production Sharing Agreement (MPSA) No. 209-2005-III

The projected annual production rate ranges between 600,000 to 1.5 million Wet Metric Tons (WMT) of nickel silicate and associated metal ores.

This Certification is issued in compliance to the requirements of Presidential Decree No. 1586, in accordance to Department Administrative Order No. 2003-30. The Bureau, however, is not precluded from reevaluating, adding, removing, and correcting any deficiencies or errors that may be found after issuance of this Certificate

Issued at DENR, Quezon City Philippines this JUL 09 2007

Approved by

ANGELO T. REYES
Secretary

Recommending Approval

ELY ANTHONY R. OUANO
OIC, Director

DENR02-011068

SWORN STATEMENT OF OWNER

I Enrique C Fernandez proponent of this Nickel Silicate and Associated Metal Ore Open Mining Project located at Sta Cruz and Candelaria Zambales takes full responsibility in complying with all conditions contained in this Environmental Compliance Certificate (ECC)

ENRIQUE C FERNANDEZ
Signature
TIN NO [illegible]
President, ERAMEN MINERALS, INC.
(Proponent)

Subscribed and sworn to before me this JUL 12 2007 the above named affiant taking oath presenting Residence Certificate No [illegible] issued on [illegible] at [illegible]

Signature of Administering Officer

ATTY. LOPE M. VELASCO
NOTARY PUBLIC
Until Dec. 31, 2007
TIN O.R. No. 3333617 – Mla. 01/05/07
IBP O.R. No. 691575 – Mla. 01/05/07
TIN 212-465-989
Roll No. 28747

DOC. NO. 126
PAGE NO. 25
BOOK NO. XX
SERIES OF 2007

I. CONDITIONS

ENVIRONMENTAL MANAGEMENT PLAN

The proponent shall ensure that all commitments, appropriate mitigating/enhancement measures and monitoring requirements especially those contained in the EIS, its modifications and additional information as approved by the EMB during the EIS review shall be instituted and strictly implemented throughout the project implementation, such as but not limited to:

1. Undertake Information, Education and Communication (IEC) Program to explain to all stakeholders the Environmental Management and Monitoring Plan (EMMP) embodied in its EIS and the conditions of this Certificate as well as an update of project status including any significant changes on the EMMP, results of MMT activities and over-all performance against this Certificate.

2. Submit an Abandonment Plan to the EMB and EMB Region III one (1) year prior to the project's abandonment. The plan shall include rehabilitation measures/clean up/ remediation of areas possibly contaminated with other substance and proposed alternative projects in the area.

GENERAL CONDITIONS

3. Comply with the environmental management and protection requirements of the pertinent provisions of the Philippine Mining Act of 1995 (R.A. 7942) and its implementing rules and regulations (DAO. No. 96-40, as amended), as well as the Memorandum of Agreement between the EMB and MGB executed on April 16, 1998. These include, among others:

   3.1 Submit an Environmental Protection and Enhancement Program (EPEP), with the Final Mine Rehabilitation and/or Decommissioning Plan (FMR/DP) integrated thereto thru the MGB for approval of CLRF Steering Committee. The plan shall also include measures so as not to destroy any of the springs located within or near its mining premises.

   3.2 Set-up a Contingent Liability and Rehabilitation Fund (CLRF) in a Environmental Trust Fund (ETF). The CLRF shall consist of the Mine Rehabilitation Fund (MRF), the Mine Waste and Tailings Fees (MWTF) and the Final Mine Rehabilitation and Decommissioning Fund (FMRDF), and

   3.3 Establishment of an MRF Committee and its monitoring arm, Multi-partite Monitoring Team (MMT).

4. Establish a Mine Environmental Protection and Enhancement Office (MEPEO) to competently handle the environment related aspects of the project in addition to the monitoring requirements as specified in the Environmental Management Plan (EMP)/Environmental Monitoring Plan (EMoP). The MEPEO shall:

   4.1 Implementation of a Social Development and Management Program (SLMP). The reports shall be submitted to MGB Region III on an annual basis.

   4.2 Monitor actual project impacts vis-à-vis the predicted impacts and management measures in the EIS;

   4.3 Submit all environmental reports to EMB and EMB Region III semi-annually, and

   4.4 Ensure that monitoring and reporting are carried out as required.

II. RESTRICTIONS

5. The extraction method within the mining area shall be contour mining with no on-site processing and blasting involved, and

6. In case of transfer of ownership of the project, these same conditions and restrictions shall apply and the transferee shall be required to notify the EMB within fifteen (15) days as regards to the transfer of ownership.

Non-compliance with any of the provisions of this Certificate shall be sufficient cause for the cancellation or suspension of this Certificate and/or imposition of a fine in an amount not to exceed Fifty Thousand Pesos (PHP 50,000.00) thereof.

O.R. No. 8982524 Date 5/9/2006
Processing Fee PHP 8,000

ERAMEN MINERALS INC. Nickeliferous Laterite Mining Project Sta. Cruz and Candelaria, Zambales	Environmental Compliance Certificate	EPEP Annex 2

PROJECT ASSESSMENT PLANNING TOOL

For the assistance of the Proponent and government agencies concerned in the management of the project and for better coordination in mitigation on the impact of the project on its surrounding areas and to the environment.

By way of recommendation, the following have been taken notice of by the EIA Review Committee and are forwarding these recommendations to the parties and authorities concerned for proper appreciation and action.

	RECOMMENDATIONS	CONCEERNED GOVERNMENT AGENCIES/ENTITIES
1	Sanitation Code of the Philippines	DOH
2	Labor Code of the Philippines including occupational safety and safety standards for all mining activities and provide personal protective equipment for the workers, and	DOLE-Bureau of Working Condition/MGB
3	Building Code of the Philippines	Municipal Planning & Devt Officer/LGU Concerned
	ENVIRONMENTAL PLANNING RECOMMENDATIONS FOR THE PROPONENT	
4	Conduct research in using local appropriate species that can be used for rehabilitation purposes to approximate the original vegetation cover to have a successful rehabilitation of the area in coordination with the Forest Management Bureau (FMB).	
5	Formulate a program in developing alternative water supply for the municipality of Sta Cruz and Candelaria in coordination with the LGU and NWRB	
6	Accommodate the Reforestation Program of the Rotary Club of Sta. Cruz to be harmonized with the Environmental Protection and Enhancement Program (EPEP) in coordination with the FMB and MGB.	
7	Provide high-resolution imagery of project area to reflect current environmental conditions before mining and every six years thereafter	
8	Host a website that will provide information on the physical, social, and economic impacts of the project, including compliance to its various commitments stipulated in the EIS and EC program	

For dissemination and proper action of the parties concerned.

TEODORO M. SANTOS
CIARC Chairman

ESPERANZA A. SAJUL
OIC EIAM Division

ELY ANTHONY R. OUANO
OIC, Director

Republic of the Philippines
DEPARTMENT OF ENVIRONMENT & NATURAL RESOURCES
MINES AND GEOSCIENCES BUREAU
Regional Office No. III

MINE REHABILITATION FUND COMMITTEE

SOCIAL DEVELOPMENT AND MANAGEMENT PROGRAM (SDMP)

CERTIFICATE OF APPROVAL
SDMP # 12-2008-02-IIIA

The Mines and GeoSciences Regional Office No. III (MGB, R-III) having approved the Amended Social Development and Management Program (SDMP) hereby grants this Certificate of Approval to ERAMEN MINERALS, INC. (EMI) with an area of 3,849 hectares in the Municipalities of Sta. Cruz and Candelaria, Province of Zambales.

This certificate is being issued as an amendment to the previous Certificate of Approval issued on May 5, 2008 subject to the pertinent provisions of the D.A.O.s and conditions stated therein.

Given this 3rd day of December, 2009 at the City of San Fernando, Province of Pampanga.

LORETO B. ALBURO, CESO VI
Regional Director
and MRFC Chairman

Conforme :

MR. ENRIQUE C. FERNANDEZ
President
ERAMEN MINERALS, INC.

09-1440

Cloefer's Bldg., Gen. Hizon Ave.,
City of San Fernando, Pampanga
Tel. No. (045) 961-2799 • 963-6387

MRFC MEMBERS:

ENGR. CARLOS J. MAGNO
Member
Regional Director, EMB-RIII

CESAR D. ESTRADA
Member
ENRO-Zambales

ENRIQUE C. FERNANDEZ
Member
ERAMEN Minerals, Inc.

EDGARDO G. VILLAMANTE
Member
NGO Representative
SAMAGSACA, Inc.

NELSON F. CASTRO
Co-Chairman
PENRO-Zambales

Republic of the Philippines
DEPARTMENT OF ENVIRONMENT & NATURAL RESOURCES
MINES AND GEOSCIENCES BUREAU
Regional Office No. III

SOCIAL DEVELOPMEMENT AND MANAGEMENT PROGRAM (SDMP)

CERTIFICATE OF APPROVAL

SDMP # 012 -2008-03 III

The Mines and Geosciences Bureau Regional Office No. III (MGB, R-III), having approved the Social Development and Management Program (SDMP), hereby grants this Certificate of Approval to ERAMEN MINERALS, INC. for the Nickel Silicate and Associated Metal Ore Open Pit Mining Project covering Five Hundred (500.00) hectares in the southern portion out of their 4,619.6869 hectares approved Mineral Production Sharing Agreement (MPSA) No. 209-2005-III. The said portion is located in Barangay Uacon, and Barangays Lucapon South, Lucapon North, Naulo, Municipality of Candelaria & Sta. Cruz, respectively, Province of Zambales after substantially complying with the SDMP requirements as mandated under DENR Administrative Order (D.A.O.) No. 96-40, as amended and D.A.O. No. 2000-99.

This certificate is being issued subject to the pertinent provisions of the above-mentioned D.A.Os and the following conditions:

1. This Certificate is valid only for the activities stipulated in the approved SDMP (hereto attached as Annex "A" and made an integral part hereof);

2. The Permittees and Operator shall submit Annually a sworn statement of the one percent (1%) Direct Mining and Milling Costs (DMMC) within sixty (60) calendar days after the end of each year to the MGB Regional Office (R.O.) No. III, copy furnished the MGB Central Office (CO). The 1% DMMC allotted to implement the SDMP is separate and distinct from the two percent (2%) excise tax being levied pursuant to Republic Act. No. 7729, Amendments to the National Internal Revenue Code, and distributed to the concerned Local Government Units in accordance with Republic Act No. 7160, the Local Government Code of 1991;

3. The Permittees and Operator shall notify the MGB RO-III and MGB CO of any alterations from the approved SDMP;

4. The Permittees and Operator shall submit to the MGB RO-III, copy furnished the MGB CO, its Annual Social Development and Management Program (ASDMP), thirty (30) calendar days before the beginning of every calendar year, and monthly Internal Monitoring and Evaluation Reports, as well as its semi-annual Accomplishment Reports;

5. Additional conditions may be imposed to effectively implement the approved SDMP/ASDMP should the results of monitoring by the MRFC thru its monitoring arm, the Multipartite Monitoring Team (MMT), warrant them;

6. This certificate shall be considered automatically revoked if the project/operation is suspended or stopped for more than two (2) years; and

7. Transfer of ownership or assignment of the project carries with it the same conditions in this Certificate for which written notification shall be made by the Permittees and Operator to the MGB RO-III within fifteen (15) days from such transfer.

Non-compliance with any of the above conditions shall be sufficient ground for the cancellation, revocation or termination of this Certificate or suffer the penalty prescribed in the Penal Provisions of Republic Act No. 7942, the Philippine Mining Act of 1995.

Given and approved this 05 MAY 2008 at City of San Fernando, Pampanga, Philippines

ATTY. ANSELMO C. ABUNGAN
Regional Director

Conforme:

ENRIQUE C. FERNANDEZ
President
ERAMEN MINERALS, INC

ENVIRONMENTAL PROTECTION AND ENHANCEMENT PROGRAM (EPEP) COST

ANNEX 4

ACTIVITY	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12
Progressive Rehab. Cost	7,200,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00
Monitoring and Maintenance Cost													
-Water Quality													
Physical	580,000.00	30,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00
Chemical	580,000.00	30,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00
Biological	580,000.00	30,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00
- Air Quality													
Dust	580,000.00	30,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00
Gaseous Emission	580,000.00	30,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00
- Noise	580,000.00	30,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00
Worker Occupational Health and Safety	2,870,000.00	120,000.00	250,000.00	250,000.00	250,000.00	250,000.00	250,000.00	250,000.00	250,000.00	250,000.00	250,000.00	250,000.00	250,000.00
Maintenance of Nursery	2,870,000.00	120,000.00	250,000.00	250,000.00	250,000.00	250,000.00	250,000.00	250,000.00	250,000.00	250,000.00	250,000.00	250,000.00	250,000.00
Watering of Haul Roads	9,400,000.00	600,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00
Maintenance of Haul Road	9,400,000.00	600,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00
Maint. Of Drainage Canal & silt traps	9,400,000.00	600,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00
Maintenance of Drainage, siltation pond and mining area	9,400,000.00	600,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00
Maintenance of Ore Stockyard	5,800,000.00	300,000.00	500,000.00	500,000.00	500,000.00	500,000.00	500,000.00	500,000.00	500,000.00	500,000.00	500,000.00	500,000.00	500,000.00
Maintenance of Waste Dumps/ overburden stockpile Area	4,700,000.00	300,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00
Maintenance of Laboratory	4,700,000.00	300,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00
Maintenance of Mining Equipment	4,700,000.00	300,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00
Maintenance of Pollution Control and Monitoring Equipment	4,700,000.00	300,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00	400,000.00
Research Component	3,400,000.00	100,000.00	300,000.00	300,000.00	300,000.00	300,000.00	300,000.00	300,000.00	300,000.00	300,000.00	300,000.00	300,000.00	300,000.00
MMT Monitoring Expenses	9,400,000.00	600,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00	800,000.00
TOTAL	91,420,000.00	5,620,000.00	7,800,000.00	7,800,000.00	7,800,000.00	7,800,000.00	7,800,000.00	7,800,000.00	7,800,000.00	7,800,000.00	7,800,000.00	7,800,000.00	7,800,000.00

ANNEX 1

Geographical Coordinates of the Project

BLOCK 1 AREA : 99.0 HECTARES

Corner	Latitude	Longitude
1	15°48'04.444"	119°59'19.606"
2	15°48'04.444"	119°59'59.920"
3	15°47'35.162"	119°59'59.920"
4	15°47'35.162"	119°59'29.684"
5	15°47'44.923"	119°59'29.684"
6	15°47'44.923"	119°59'19.606"

BLOCK 2 AREA : 9.0 HECTARES

Corner	Latitude	Longitude
1	15°47'35.162"	120°00'30.156"
2	15°47'35.162"	120°00'40.235"
3	15°47'25.401"	120°00'40.235"
	15°47'25.401"	120°00'30.156"

BLOCK 3 AREA : 349.96 HECTARES

Corner	Latitude	Longitude
1	15°48'09.202"	120°01'43.831"
2	15°48'09.202"	120°02'41.178"
3	15°47'54.683"	120°02'41.178"
4	15°47'54.683"	120°02'51.258"
5	15°47'44.923"	120°02'51.258"
6	15°47'44.923"	120°03'21.498"
7	15°47'54.863"	120°03'21.498"
8	15°47'54.863"	120°03'31.576"
9	15°48'04.444"	120°03'31.576"
10	15°48'04.444"	120°03'41.605"

11	15°48'14.105"	120°03'41.605"
12	15°48'14.105"	120°03'51.792"
13	15°48'04.444"	120°03'51.792"
14	15°48'04.444"	120°04'21.963"
15	15°47'54.863"	120°04'21.963"
16	15°47'54.863"	120°04'11.985"
17	15°47'45.103"	120°04'11.985"
18	15°47'45.103"	120°04'01.807"
19	15°47'35.501"	120°04'01.807"
20	15°47'35.501"	120°03'51.279"
21	15°47'25.302"	120°03'51.279"
22	15°47'25.302"	120°03'41.950"
23	15°47'23.452"	120°03'41.950"
24	15°47'23.452"	120°02'54.221"
25	15°47'33.185"	120°02'54.221"
26	15°47'33.185"	120°02'34.168"
27	15°47'42.954"	120°02'34.168"
28	15°47'42.954"	120°02'24.601"
29	15°47'52.505"	120°02'24.601"
30	15°47'52.505"	120°01'50.582"
31	15°47'52.505"	120°01'43.831"

BLOCK 4 AREA : 108.79 HECTARES

Corner	Latitude	Longitude
1	15°47'15.641"	120°03'44.717"
2	15°47'15.641"	120°04'01.807"
3	15°47'25.402"	120°04'01.807"
4	15°47'25.402"	120°04'11.885"
5	15°47'35.162"	120°04'11.885"
6	15°47'35.162"	120°04'21.963"
7	15°46'56.120"	120°04'21.963"

8	15°46'56.120"	120°04'01.807"
9	15°46'46.359"	120°04'01.807"
10	15°46'46.359"	120°03'44.717"

BLOCK 5 AREA : 1,609.39 HECTARES

Corner	Latitude	Longitude
1	15°44'25.317"	119°58'27.110"
2	15°44'25.317"	119°58'47.217"
3	15°44'29.790"	110°58'47.217"
4	15°44'29.790"	120°00'30.687"
5	15°46'29.790"	120°00'30.687"
6	15°46'29.790"	120°00'30.156"
7	15°46'36.799"	120°00'30.156"
8	15°46'36.799"	120°00'20.077"
9	15°46'56.120"	120°00'20.077"
10	15°46'56.120"	120°00'30.156"
11	15°47'05.981"	120°00'30.156"
12	15°47'05.981"	120°00'40.235"
13	15°46'56.126"	120°00'40.235"
14	15°46'56.126"	120°00'50.314"
15	15°47'03.903"	120°00'50.314"
16	15°47'03.903"	120°01'00.323"
17	15°46'56.120"	120°01'00.323"
18	15°46.56.120"	120°01'20.550"
19	15°47'03.903"	120°01'20.550"
20	15°47'03.903"	120°01'50.786"
21	15°46'57.863"	120°01'50.786"
22	15°46'57.863"	120°01'24.220"
23	15°46'47.010"	120°01'24.220"
24	15°46'47.010"	120°01'20.550"
25	15°46'17.083"	120°01'20.550"

26	15°46'17.083"	120°01'24.220"
27	15°45'57.563"	120°01'24.220"
28	15°45'57.563"	120°01'40.710"
29	15°45'57.563"	120°02'00.867"
30	15°45'48.369"	120°02'00.867"
31	15°45'48.369"	120°01'53.540"
32	15°45'47.799"	120°01'53.540"
33	15°45'47,799"	120°01'50.788"
34	15°45'30.000"	120°01'50.788"
35	15°45'30.000"	120°01'30.000"
36	15°43'50.672"	120°01'30.000"
37	15°43'50.672"	120°01'18.448"
38	15°43'46.277"	120°01'18.448"
39	15°43'46.277"	120°00'58.291"
40	15°43'26.756"	120°00'58.291"
41	15°43'26.756"	120°00'38.134"
42	15°43'46.277"	120°00.38.134"
43	15°43'46.277"	119°59'27.584"
44	15°43'36.516"	119°59'27.584"
45	15°43'36.516"	119°59'17.505"
46	15°43'46.277"	119° 59'17.505"
47	15°43'46.277"	119°58'57.348"
48	15°43'36.516"	119°58'57.348"
49	15°43'36.516"	119°58'47.269"
50	15°43'46.277"	119°58'47.269"
51	15°43'46.277"	119°58'37.190"
52	15°44'15.559"	119°58'37.190"
53	15°44'15.559"	119°58'27.110"

BLOCK 6 AREA : 162.05 HECTARES

Corner	Latitude	Longitude
1	15° 46' 02.192"	119° 57' 56.874"
2	15° 46' 02.192"	119° 58' 17.032"
3	15° 45' 33.641"	119° 58' 17.032"
4	15° 45' 33.641"	119° 58' 27.110"
5	15° 44' 35.078"	119° 58' 17.032"
7	15° 44' 54.599"	119° 58' 17.032"
8	15° 45' 54.599"	119° 58' 06.954"
9	15° 45' 14.120"	119° 58' 06.954"
10	15° 45' 14.120"	119° 58' 56.874"

BLOCK 7 AREA : 2,240.04 HECTARES

Corner	Latitude	Longitude
1	15° 42' 33.402"	119° 58' 43.586"
2	15° 42' 33.402"	119° 59' 03.743"
3	15° 42' 23.642"	119° 59' 03.743"
4	15° 42' 23.642"	119° 59' 13.822"
5	15° 42' 13.881"	119° 59' 13.822"
6	15° 42' 13.881"	119° 59' 23.900"
7	15° 42' 04.121"	119° 59' 23.900"
8	15° 42' 04.121"	119° 59' 33.979"
9	15° 41' 54.200"	119° 59' 33.979"
10	15° 41' 54.200"	119° 59' 44.057"
11	15° 42' 04.121"	119° 59' 44.057"
12	15° 42' 04.121"	119° 59' 54.136"
13	15° 42' 13.881"	119° 59' 54.136"
14	15° 42' 13.881"	119° 59' 44.057"
15	15° 42' 23.642"	119° 59' 44.057"
16	15° 42' 23.642"	119° 59' 33.979"
17	15° 42' 33.402"	119° 59' 33.979"

18	15° 42' 33.402"	119° 59' 23.900"
19	15° 43' 31.966"	119° 59' 23.900"
20	15° 43' 31.966"	120° 00' 34.350"
21	15° 43' 22.205"	120° 00' 34.350"
22	15° 43' 22.205"	120° 01' 04.686"
23	15° 43' 46.275"	120° 01' 04.686"
24	15° 43' 46.275"	120° 01' 18.447"
25	15° 43' 50.670"	120° 01' 18.447"
26	15° 43' 50.670"	120° 01' 34.922"
27	15° 43' 41.726"	120° 01' 34.922"
28	15° 43' 41.726"	120° 01' 55.079"
29	15° 43' 12.445"	120° 01' 55.079"
30	15° 43' 12.445"	120° 02' 05.158"
31	15° 43' 02.684"	120° 02' 05.158"
32	15° 43' 02.684"	120° 01' 55.079"
33	15° 42' 43.163"	120° 01' 55.079"
34	15° 42' 43.163"	120° 01' 45.001"
35	15° 41' 54.360"	120° 01' 45.001"
36	15° 41' 54.360"	120° 01' 34.922"
37	15° 41' 25.079"	120° 01' 34.922"
38	15° 41' 25. 079"	120° 01' 45.001"
39	15° 41' 44.600"	120° 01' 45.001"
40	15° 41' 44.600"	120° 01' 55.079"
41	15° 41' 25.079"	120° 01' 55.079"
42	15° 41' 25.079"	120° 02' 15.237"
43	15° 41' 44.600"	120° 02' 15.237"
44	15° 41' 44.600"	120° 02' 25.315"
45	15° 41' 54.360"	120° 02' 25.315"
46	15° 41' 54.360"	120° 02' 05.158"
47	15° 42' 04.121"	120° 02' 05.158"
48	15° 42' 04.121"	120° 02' 15.237

49	15° 42' 23.642"	120° 02' 15.237"
50	15° 42' 23.642"	120° 02' 45.470"
51	15° 42' 43.163"	120° 02' 45.470"
52	15° 42' 43.163"	120° 02' 55.548"
53	15° 42' 04.121"	120° 02' 55.548"
54	15° 42' 04.121"	120° 02' 45.470"
55	15° 41' 44.600"	120° 02' 45.470"
56	15° 41' 44.600"	120° 02' 35.394"
57	15° 41' 25.079"	120° 02' 35.394"
58	15° 41' 25.079"	120° 02' 25.601"
59	15° 41' 05.557"	120° 02' 25.601"
60	15° 41' 05.557"	120° 02' 05.158"
61	15° 40' 55.797"	120° 02' 05.158"
62	15° 40' 55.797"	120° 01' 24.844"
63	15° 40' 46.036"	120° 01' 24.844"
64	15° 40' 46.036"	120° 00' 24.372"
65	15° 41 05.557"	120° 00' 24.372"
66	15° 41' 05.557"	120° 00' 34.350"
67	15° 41' 15.318"	120° 00' 34.350"
68	15° 41' 15.318"	120° 00' 24.372"
69	15° 41' 25.079"	120° 00' 24.372"
70	15° 41' 25.079"	120° 00' 04.215"
71	15° 41' 15.318"	120° 00' 04.215"
72	15° 41' 15.318"	120° 00' 00.000"
73	15° 41' 30.000"	120° 00' 00.000"
74	15° 41' 30.000"	119° 59' 30.000"
75	15° 42' 00.000"	119° 59' 30.000"
76	15° 42' 00.000"	119° 59' 13.822"
77	15° 42' 04.121"	119° 59' 13.822"
78	15° 42' 04. 121"	119° 59' 03.743"
79	15° 42' 13.881"	119° 59' 03.743"

80	15° 42' 13.881"	119° 58' 43.586"

BLOCK 8 AREA : 36.71 HECTARES

Corner	Latitude	Longitude
1	15° 45' 38.037"	120° 01' 50.786"
2	15° 45' 47.804"	120° 01' 50.786"
3	15° 45' 47.804"	120° 01' 53.540"
4	15° 45' 38.606	120° 01' 53.540"
5	15° 45' 38.606"	120° 02' 03.761"
6	15° 45' 47.799"	120° 02' 03.761"
7	15° 45' 47.799"	120° 02' 10.944"
8	15° 45' 57.563"	120° 02' 10.944"
9	15° 45' 57.563"	120° 02' 13.841"
10	15° 45' 48.369"	120° 02' 13.841"
11	15° 45' 48.369"	120° 02' 23.921"
12	15° 45' 57.563"	120° 02' 23.921"
13	15° 45' 57.563"	120° 02' 30.970"
14	15° 45' 38.070"	120° 02' 30.970"

BLOCK 9 AREA : 7.92 HECTARES

Corner	Latitude	Longitude
1	15° 46' 47.010"	120° 01' 24.220"
2	15° 46' 47.010"	120° 01' 20.550"
3	15° 46' 47.083"	120° 01' 20.550"
4	150° 46' 17.083	120° 01' 24.220"

atrix indicating the relevant activities, potential impacts, mitigating measures and responsible entities for all project phases (use/refer to table of EMB's format in Annex 2.

nvironmental Impacts and Mitigating Measures

Potential Activities	Impacts	Mitigating Measures	Cost	Responsible Entity
Land clearing of ore ile area, mine and stripping of rite horizon	1. Loss of vegetation 2. Acceleration of non-mineable area 3. Siltation of creek and nickel laterites 4. Stripping of overburden 5. Silt-laden run-off	1. Replanting in stripped/mined out areas and rehabilitation of the mine areas will be done progressively with the operations 2. Construction of drainage canals 3. Construction of overburden stockpile area 4. Construction settling ponds	MGB, EMB, LGU and concerned gov't agencies (PHP 150,000/ha quarter)	
Overburden stockpile area 2. Dust generation	Siltation	1. Construction of drainage canals 2. Covering with tarpaulin during rain		
Beaching of creek and area/causeway/pier ntial liquefaction	Siltation	1. Construction of drainage canals 2. Construction of ore stockpile area 3. Construction settling ponds		
Mine site and runoff overburden stockpile area	1. Siltation 2. Siltation ater	1. Construction of periphery canals 2. Construction of drainage system and canals 3. Construction settling ponds		
Manual crushing and ore stockyard	1. Siltation 2. Siltation	1. Construction of periphery canals for ore stockyard 2. Construction of drainage system and construction of drainage canals 3. Construction settling ponds		
e generated by tal analysis	Mastitis, skin irritation, dermatitis	1. All acid wastes will be diluted with water and neutralized with lime before disposal to septic tanks		

atrix indicating the relevant activities, potential impacts, mitigating measures and responsible entities for all project phases (use/refer to table of EMB's format in Annex 2.

nvironmental Impacts and Mitigating Measures

	d cobalt	2. Construction of septic tanks analysis	
, DOLE rned	Noise generation due to heavy equipment and machineries	1. Periodic maintenance of all engines and moving equipment and vehicles 2. Periodic maintenance of power house and pumps and the sealing of all openings to minimize the effect of noise disturbance	MGB. EMB, LGU, DOLE and other concerned gov't agencies
	al breaking of ore ed sizes	Noise generation during operation 1. Planting of trees along the boundary line of the premises to serve as sound barriers and to minimize the noise effect in the surrounding areas ion of ear muffs to workers	
	d	Noise generation during operation of the facility 1. Limiting the hours of operation of the conveyor/pier and when the demand is low and when unloading operations at the pier are not being carried out 2. Planting of trees along the boundary line of the yard along the conveyor/pier to serve as sound barriers and to minimize the noise effect in the surrounding areas	
uality o s	Dust generation from stripping operation and haul roads	Dust generation from fugitive dust 1. Water spraying of haul roads during dry season or during dry months to suppress dust due to passing of haul trucks 2. Trucks loaded with ore shall be covered with canvas or tarpaulin to prevent the escape of dust to the environment 3. Cleaning of haul trucks to remove soil carryover from the undercarriage and wheel assemblies 4. Limiting the speed of service vehicles, haul trucks and other heavy equipment	MGB. EMB, LGU and other concerned gov't agencies
	eavy equipment and chineries	Emission from mobile sources 1. Periodic maintenance of all engines either fix or mobile equipment and machineries to minimize occurrence of excessive exhaust gasses coming from diesel powered engines	
	waste from	Generation of wastes 1. Segregation of wastes	Air quality in the area will be

	d cobalt	2. Construction of septic tanks analysis	
, DOLE rned	Noise generation due to heavy equipment and machineries	1. Periodic maintenance of all engines and moving equipment and vehicles 2. Periodic maintenance of power house and pumps and the sealing of all openings to minimize the effect of noise disturbance	MGB. EMB, LGU and other concerned gov't agencies
	al breaking of ore ed sizes	Noise generation during operation 1. Planting of trees along the boundary line of the premises to serve as sound barriers and to minimize the noise effect in the surrounding areas ion of ear muffs to workers	
	d	Noise generation during operation of the facility 1. Limiting the hours of operation of the conveyor/pier and when the demand is low and when unloading operations at the pier are not being carried out 2. Planting of trees along the boundary line of the yard along the conveyor/pier to serve as sound barriers and to minimize the noise effect in the surrounding areas	
uality o s	Dust generation from stripping operation and haul roads	Dust generation from fugitive dust 1. Water spraying of haul roads during dry season or during dry months to suppress dust due to passing of haul trucks 2. Trucks loaded with ore shall be covered with canvas or tarpaulin to prevent the escape of dust to the environment 3. Cleaning of haul trucks to remove soil carryover from the undercarriage and wheel assemblies 4. Limiting the speed of service vehicles, haul trucks and other heavy equipment	MGB. EMB, LGU and other concerned gov't agencies
	eavy equipment and chineries	Emission from mobile sources 1. Periodic maintenance of all engines either fix or mobile equipment and machineries to minimize occurrence of excessive exhaust gasses coming from diesel powered engines	
	waste from	Generation of wastes 1. Segregation of wastes	Air quality in the area will be

	laboratory analysis	from the digestion chamber during sample extraction that will release to the atmosphere via chimney	regularly conducted 2. Installation of blowers and exhaust fans		
Social issues	1. Employment to local residents 2. Implementation of the project	1. Hiring of local residents 2. Sources of taxes and livelihood project	1. Positive Impact 2. Positive impact	Incorporated in the Monitoring Trust Fund (PHP150,000/ quarter)	MGB, LGU, DOLE and other concerned gov't agencies

Annex 3 – Matrix of Environmental Monitoring Schedule

Parameters to be monitored and method of monitoring should be specific. Also provide columns for responsible entity and cost.

Activities	Parameters to be Monitored	Method of Monitoring	Location of Monitoring Station	Monitoring Frequency	Cost	Responsible Entity
1. Stripping of overburden and stockpiling at the overburden stockyard area	1. Accelerated erosion 2. Generation of siltation in receiving bodies of water 3. Generation of fugitive dust 4. Generation of emission from heavy equipment 5. Generation of noise due to mining operation and equipment 6. Vegetation loss	1. Ambient air quality sampling 2. Water quality audit 3. Noise level audit 4. Audit of environmental mitigation	Refer to location map of environmental monitoring station	Quarterly basis	Incorporated in the Monitoring Trust Fund (PHP150,000/ quarter)	MGB, EMB, LGU
2. Stripping of nickel laterite horizon and hauling to ore stockyard	1. Accelerated erosion 2. Generation of siltation in receiving bodies of water 3. Generation of fugitive dust 4. Generation of emission from heavy equipment 5. Generation of noise due to mining operation and equipment 6. Vegetation loss	1. Ambient air quality sampling 2. Water quality audit 3. Noise level audit 4. Audit of environmental mitigation	Refer to location map of environmental monitoring station	Quarterly basis	Incorporated in the Monitoring Trust Fund (PHP150,000/ quarter)	MGB, EMB, LGU
3. Manual breaking of ore at the	1. Generation of fugitive dust 2. Worker's safety and health	1. Ambient air quality sampling 2. Noise level audit	Refer to location map of environmental monitoring	Quarterly basis	Incorporated in the Monitoring Trust	MGB, EMB, LGU

stockyard		3. Audit of safety and health protection measures	station		Fund (PHP150,000/ quarter)	
4. Hauling of ore to the stockpile area at the causeway	1. Generation of siltation in receiving bodies of water 2. Generation of fugitive dust 3. Generation of emission from heavy equipment 4. Generation of noise due to mining operation and equipment	1. Ambient air quality sampling 2. Water quality audit 3. Noise level audit 4. Audit of environmental mitigation	Refer to location map of environmental monitoring station	Quarterly basis	Incorporated in the Monitoring Trust Fund (PHP150,000/ quarter)	MGB, EMB, LGU
5. Operation at the causeway	1. Generation of siltation in receiving bodies of water 2. Generation of fugitive dust 3. Generation of emission from heavy equipment 4. Generation of noise due to mining operation and equipment	1. Ambient air quality sampling 2. Water quality audit 3. Noise level audit 4. Audit of environmental mitigation	Refer to location map of environmental monitoring station	Quarterly basis	Incorporated in the Monitoring Trust Fund (PHP150,000/ quarter)	MGB, EMB, LGU
6. Laboratory analysis	1. Generation of solid and liquid wastes 2. Generation of harmless gaseous fumes	1. Ambient air quality sampling 2. Water quality audit 3. Audit of environmental mitigation	Refer to location map of environmental monitoring station	Quarterly basis	Incorporated in the Monitoring Trust Fund (PHP150,000/ quarter)	MGB, EMB, LGU
7. Water quality	Turbidity, pH, TSS, TDS, oil and grease, and heavy metals	1. Standard water quality sampling, 2. Laboratory analysis, 3. Ocular inspection, 4. Water level recorder	Refer to location map of environmental monitoring station	Quarterly basis	Incorporated in the Monitoring Trust Fund (PHP150,000/ quarter)	MGB, EMB, LGU
8. Noise Quality	Noise level	Audiometer/Noise meter	Refer to location map of environmental monitoring station	Quarterly basis	Incorporated in the Monitoring Trust Fund (PHP150,000/ quarter)	MGB, EMB, LGU
9. Air Quality	SOx, NOx, fugitive particles, Total Suspended Particulates (TSP)	1. TSP will be monitored using high volumetric sampler 2. Installed air quality control	Refer to location map of environmental monitoring station	Quarterly basis	Incorporated in the Monitoring Trust Fund (PHP150,000/	MGB, EMB, LGU

		device using portable SOx and NOx analyzer			quarter)	
10. Social Issues	Socio-economic effect of the project	Interviews with the affected communities, intensifies information education campaign (IEC)	Directly affected communities	Bi-annual/ Annual basis	Incorporated in the Monitoring Trust Fund (PHP150,000/ quarter)	MGB, EMB, LGU
11. Flora and Fauna	Species diversity and survival rate of reforestation projects (% of surviving plants per hectare) No. of migratory bird species; other species that will be identified a indicator of environmental conditions in the area; endemic species	Observations and inspections Sampling programs	Rehabilitation/reforestation areas within permitted area	Quarterly basis	Incorporated in the Monitoring Trust Fund (PHP150,000/ quarter)	MGB, EMB, LGU

Note: Harmless gaseous fumes from the digestion chamber during sample extraction are released to the atmosphere via a chimney installed over the digestion chamber, where blowers and exhaust fans are also installed

ANNEX 4

Complete listing of flora species recorded within the mining project (Eramen Minerals Inc. Environmental Impact Assessment)

Local/Common Name	Scientific Name	Family Name	Habit	Endemic/Conservation Status	Uses
Bakawang-gubat	Caralilia brachiata	Rhizophoraceae	Tree	Uncommon, rare/ not threatened	Used as medicinal plant
Dita	Alstoria macrophylla	Apocynaceae	Tree	Depleted, indigenous/ not threatened	This wood is used for making furniture, wooden soles of shoes, musical instrument, scabbards, floors, and other light construction works.
Talisay-gubat	Terminalia foetidissima	Combretaceae	Tree	Endemic/ not threatened	Used for light to medium construction
Bikal	Schizostachyyum diffusion	Poaceae	Grass	Common / not threatened	Used for furniture marketing, soil stabilization and water conserver
Mamalis	Pittosporum pentandrum	Pittosporaceae	Tree	introduced; invasive	Used to cure bronchitis; decoction of leaves as bath after childbirth or prolonged illness
Pandakaki-bagasgas	Entamia polygama	Apocynaceae	Shrub	Common/ not threatened	Invasive
Aliniani	Vacanuim myrtoides	Ericaceae	Shrub	Common/ not threatened	Invasive
Solob	Guioa koeireateria	Sapindaceae	Tree	Endemic/ not threatened	Landscaping
Anang	Diospyros pyrrhocarpa	Ebenaceae	Tree	Endemic/ not threatened	Timber
Undetermined Sp. 1		Euphorbiaceae	Tree		
Bayag-usa	Voatanga globosa	Apocynaceae	Tree	Endemic/ not threatened	Landscaping, source of alkaloids
Undetermined Sp.2		Caesalpiniaceae	Shrub		

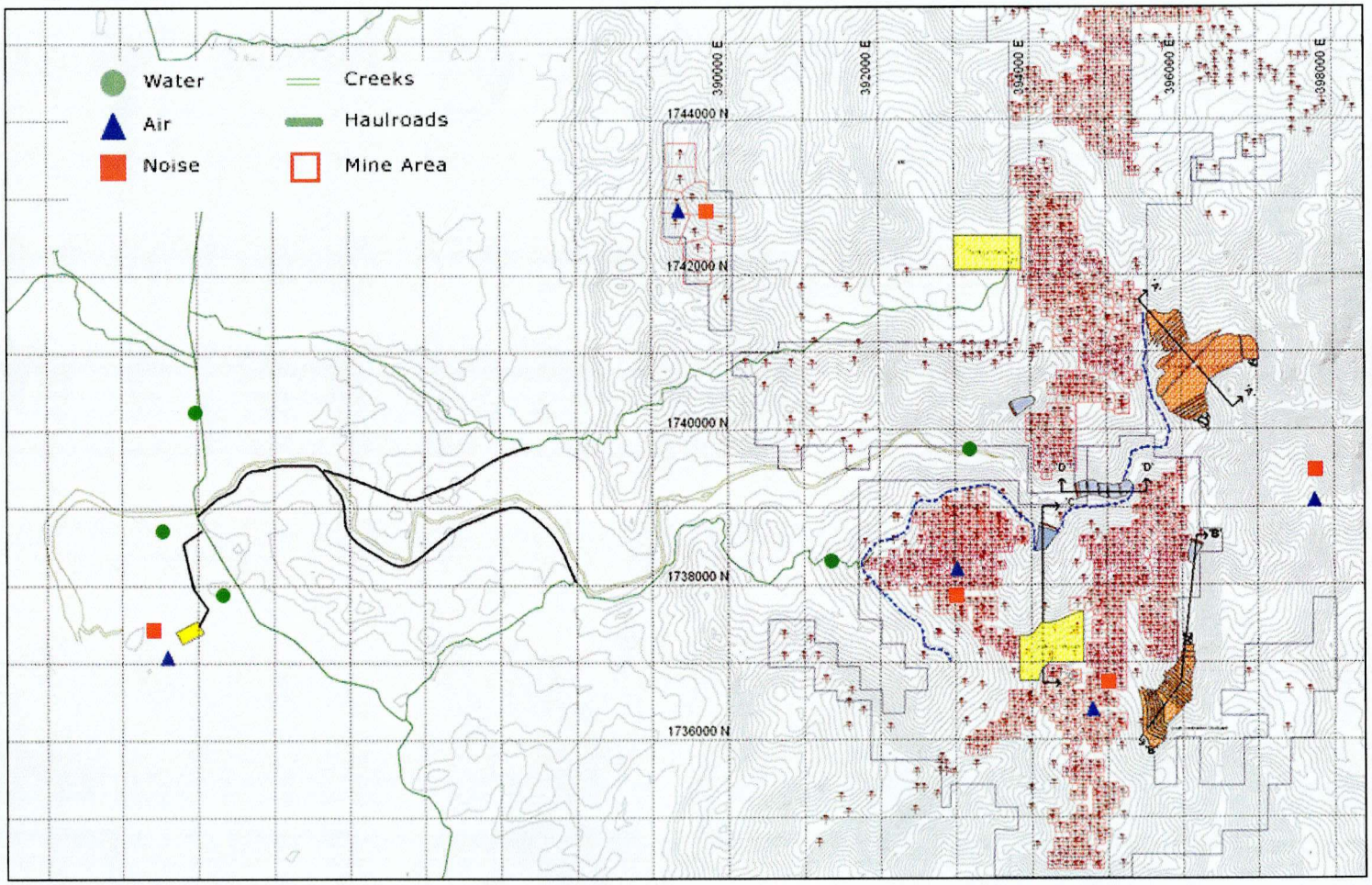
Abaniko	Belamcanda chinensis	Poaceae	Grass	Endemic/ not threatened	Used for weaving and other handicrafts
Salagong Bundok	Wikstremia polyantha	Thymelaeacae	Shrub	Common/ not threatened	Source of fibers for pulp and paper production
Katagpo	Ardisia dementis	Myrsinaceae	Tree	Endemic/ not threatened	Ornamental
Katmon-bugtong	Dillenia monantha	Dilleniaceae	Tree	Endemic/ not threatened	Invasive
Tiagkot	Arclidendron dyperia	Caesalpiniaceae	Tree	Common/ not threatened	Firewood
Kabkab	Drpnaria querafolia	Pteridaceae	Fem	Endemic/ endangered	Ornamental
Undetermined Sp. 3	Cinnamomum sp.	Lauraceae	Tree	Endemic/not threatened	Used for food condiments
Yellow lanutan	Polydrima flara	Annonaceae	Tree	Endemic/ not threatened	Landscaping
Anita	Colona philippinensis	Tiliaceae	Tree	Endemic/ not threatened	Used for light construction
Sika	Calanus caesius	Arecaceae	Palm	Endemic/ vulnerable	Furniture and handicraft
Arat	Seleria serobiculata	Cyperaceae	Herb	Endemic/ not threatened	Weeds
Alagasi	Leucosyke capitellata	Urticaceae	Tree	Common/ not threatened	Firewood
Lingo-lingo	Viticipremma philippinensis	Lamiaceae	Tree	Endemic/ vulnerable	Used for heavy construction
Bayok	Pterospermum diversifolium	Sterculiaceae	Tree	Endemic/not threatened	Used for light to medium construction
Pugahan	Caryota cumingii	Arecaceae	Palm	Endemic/ not threatened	Ornamental
Bitanghol	Calophyllum blancoi	Clusiaceae	Tree	Endemic/ not threatened	Used for heavy construction
Fragrant Dracaena	Dracaena fragrance	Liliaceae	Herb	Introduced	Ornamental
Pagsahingi	Canarium asperum	Burseraceae	Tree	Endemic/ not threatened	Used for medium to heavy construction

Antipolo	Artocarpus blacoi	Moraceae	Tree	Endemic/ vulnerable	Used for heavy construction
Agoho	Casuarinas equisetifolia	Casuarinaceae	Tree	Introduced	This wood is used in making poles, paving blocks, house posts, bridges and wharves. It is also good for beams, joists, windowsills, tool handles, firewood, and charcoal
Pagoringon	Cratoxylum sumatramum	Clusiaceae	Tree	Endemic/ not threatened	Source of dye for varnish making, used for medium to heavy construction
Binaog	Calophyllum blancoi	Clusiaceae	Tree	Endemic/ not threatened	Timber, used for railroad ties
Kalubkob	Syggium calublob	Myrtaceae	Tree	Endemic/ not threatened	Used for light construction and medicinal
Binukao	Garcinia bimucao	Clusiaceae	Tree	Endemic/ not threatened	Used as medicinal plant and as food
Tagpo	ardisia squamolosa	Myrsinaceae	Tree	Endemic/ vulnerable	Ornamental
Patangis	Talauma rillariama	Magnoliaceae	Tree	Endemic/ not threatened	Used for medium to heavy construction
Dalinsi	Terminalia pellucida	Clusiaceae	Tree	Endemic/ vulnerable	Used for light to medium construction
Salingogon	Cratoxylum formosum	Apocynaceae	Tree	Endemic/ not threatened	Source of dye for varnish making, used for medium to heavy construction
Batinog liitan	Alstomia parrifolia	Lamiaceae	Tree	Common/ not threatened	It is used for house building, especially for rafters and siding; and also for railroad ties
Molave	Vitex parriflora	Clusiacea	Tree	Endemic/vulnerable	Used for heavy construction, best suited for railroad ties
Bitanghol	Calophyllum inophyllum	Pandanaceae	Tree	Endemic/ not threatened	Timber, used for railroad ties
Pandan-gubat	Pandamus tectorius	Euphorbiaceae	Herb	Common/ not threatened	Ornamental
Binayuyu	Antidesma ghaesembilla	Clusiaceae	Tree	Common/not threatened	Invasive
Pamitoyen	Calophyllum penpetalum var. pentapetallum	Clusiaceae	Tree	Endemic/ not threatened	Used for light construction

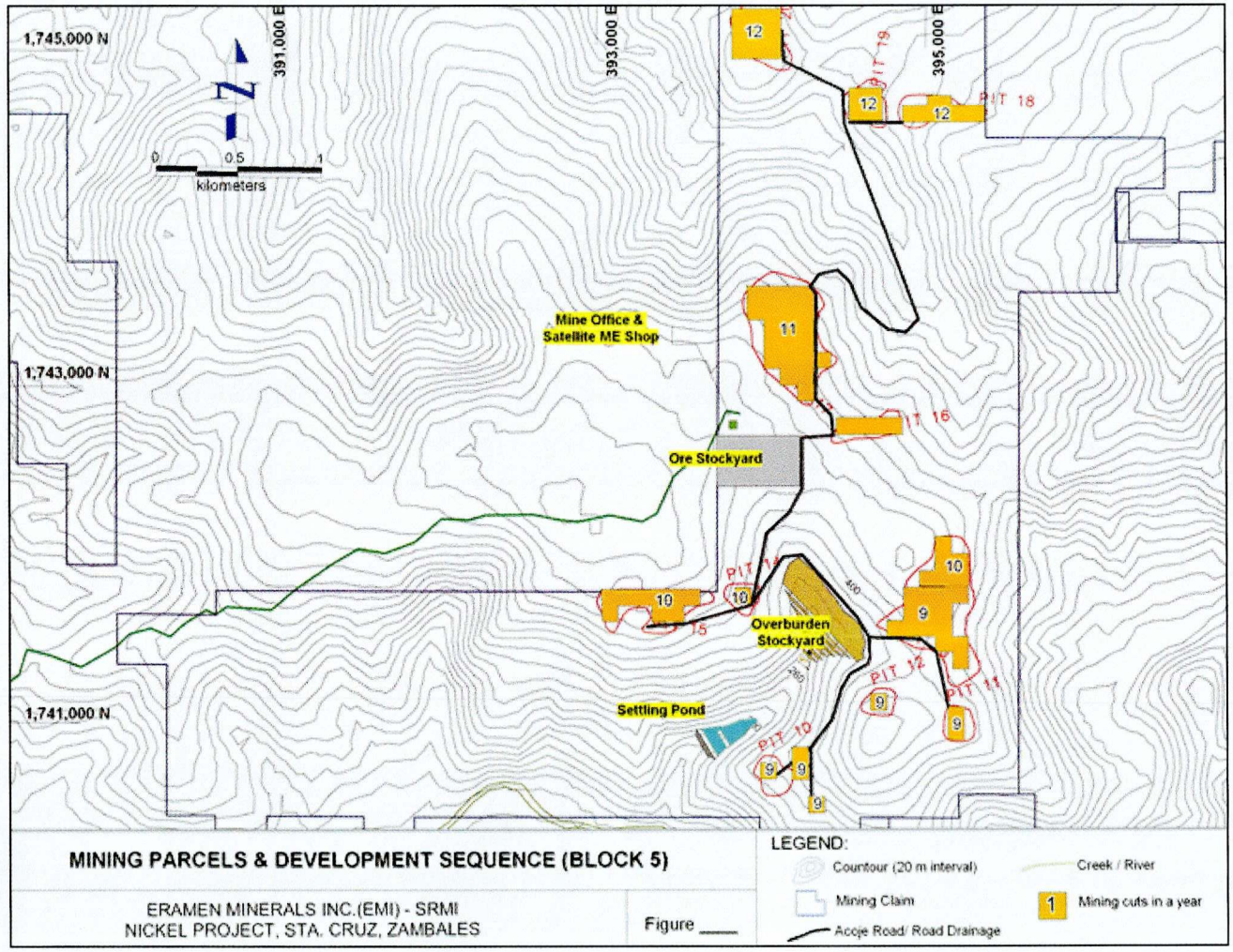
Basangal	Calophyllum ranoverbersbii	Orchidaceae	Tree	Endemic/ not threatened	Used for heavy construction
Orchid	Gramatophyllum sp.	Rubiaceae	Epiphytes	Endemic/ not threatened	Ornamental
Dinsin	Iseora luzomensis	Rutaceae	Shrub	Endemic/ not threatened	Landscaping
Tulibas mabolo	Micromelium indorum	Euphorbiaceae	Shrub	Common/not threatened	Weeds
Pamayawase	Phyllathus luzomensis	Sapotaceae	Tree	Common/ not threatened	Light construction
Banokbok	Pouteria luzomensis var. luzomensis	Combretaceae	Shrub	Common/ not threatened	Weeds
Kalumpit-like	Terminalia sp.	Ericaceae	Tree	Endemic/ not threatened	Used for medium to heavy construction
Mariveles dusong	Vaccinium cumingianim var. marirelense	Chrysobalanaceae	Tree	Endemic/ not threatened	Used for medium to heavy construction
Liusin	Maranthes corymbosa			Endemic/ not threatened	Used for medium to heavy construction

ANNEX 5

Location of Monitoring Stations



ANNEX 6A


1,745,000 N
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1,741,000 N
391,000 E
393,000 E
395,000 E
N
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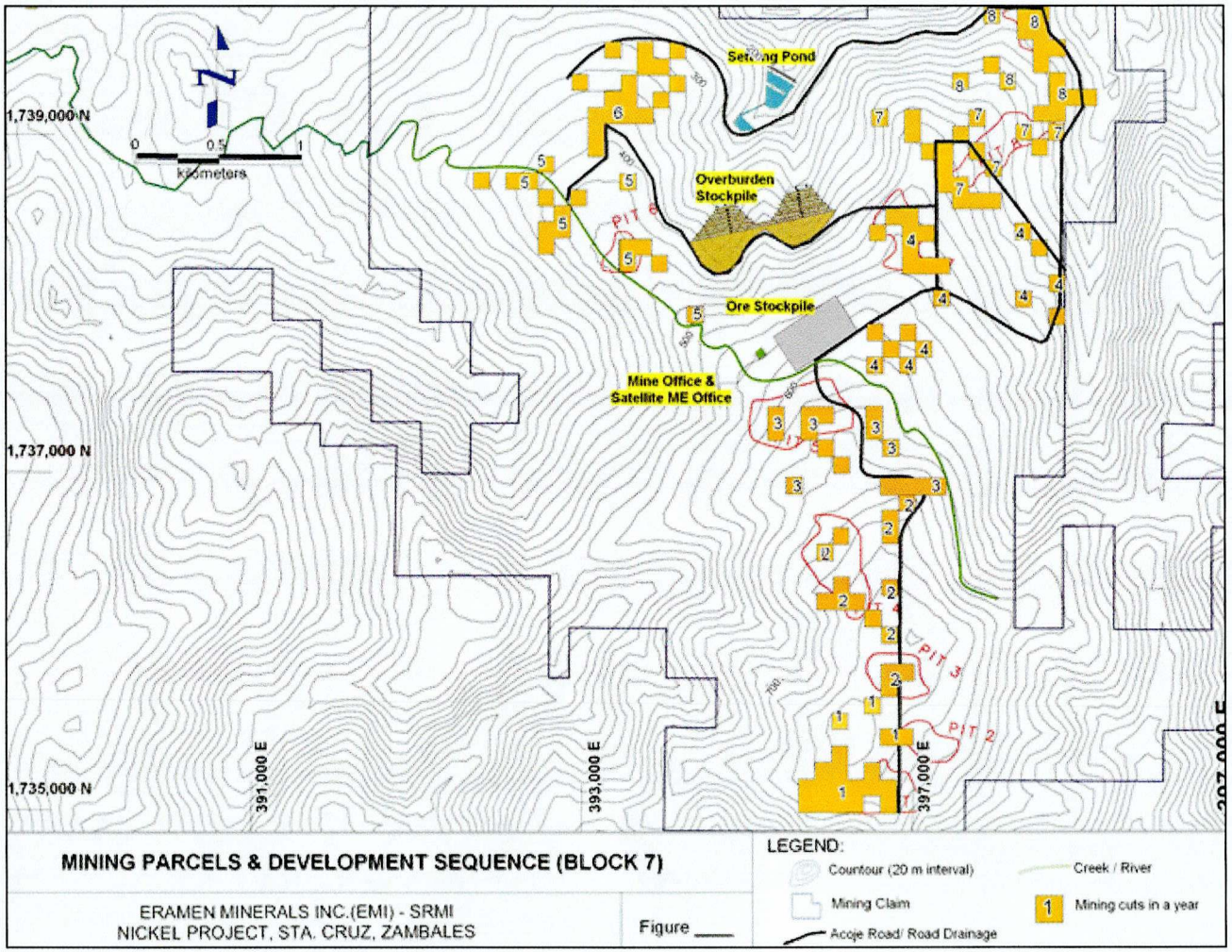
kilometers
Mine Office & Satellite ME Shop
Ore Stockyard
Overburden Stockyard
Settling Pond
PIT 19
PIT 18
PIT 16
PIT 15
PIT 12
PIT 11
PIT 10
12
11
10
9
MINING PARCELS & DEVELOPMENT SEQUENCE (BLOCK 5)
ERAMEN MINERALS INC.(EMI) - SRMI
NICKEL PROJECT, STA. CRUZ, ZAMBALES
Figure ____
LEGEND:
Countour (20 m interval)
Creek / River
Mining Claim
1
Mining cuts in a year
Accje Road/ Road Drainage

ANNEX 6B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kilometers
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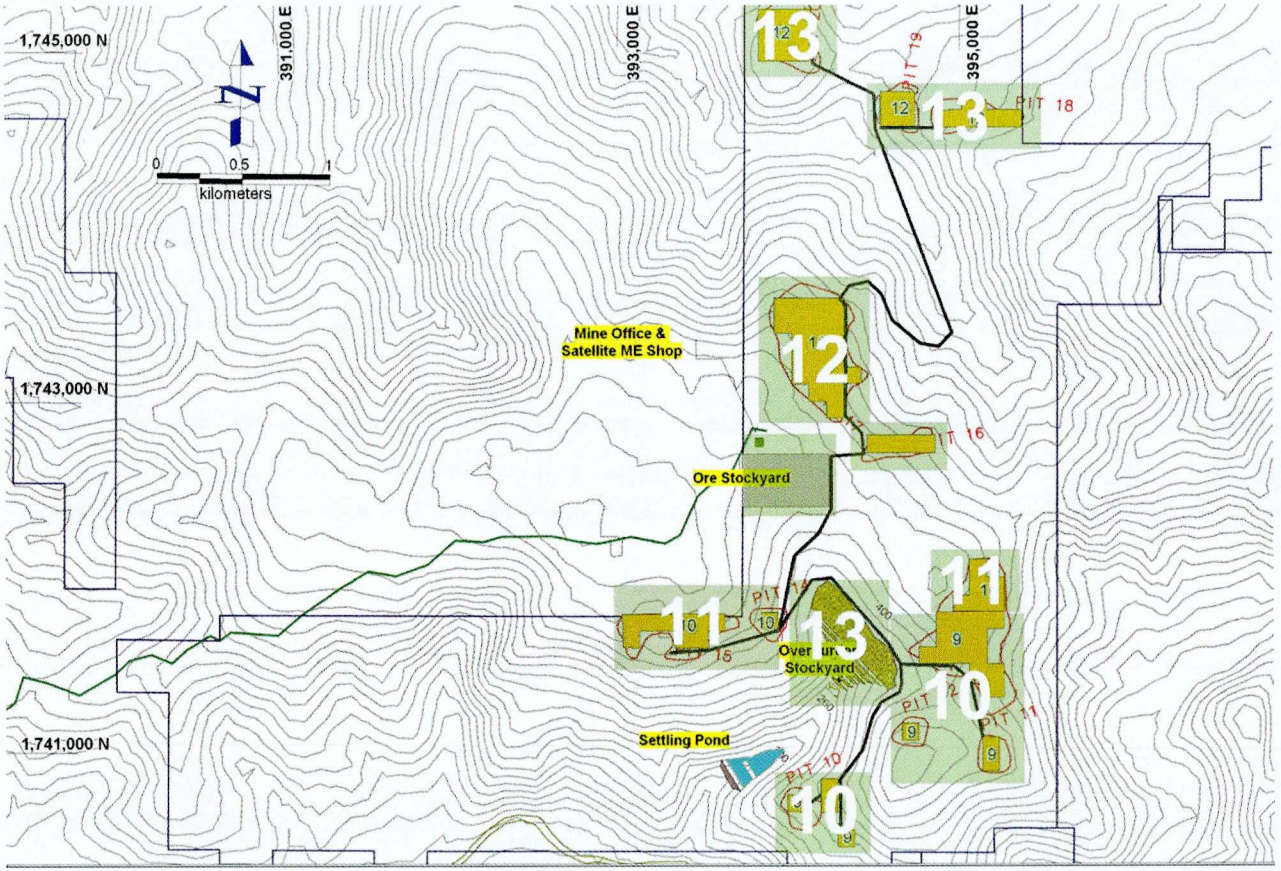
1,737,000 N
1,735,000 N
391,000 E
393,000 E
397,000 E
Setting Pond
Overburden Stockpile
Ore Stockpile
Mine Office & Satellite ME Office
PIT 3
PIT 2
MINING PARCELS & DEVELOPMENT SEQUENCE (BLOCK 7)
ERAMEN MINERALS INC.(EMI) - SRMI
NICKEL PROJECT, STA. CRUZ, ZAMBALES
Figure ___
LEGEND:
Countour (20 m interval)
Creek / River
Mining Claim
Mining cuts in a year
Acoje Road/ Road Drainage

ANNEX 7A



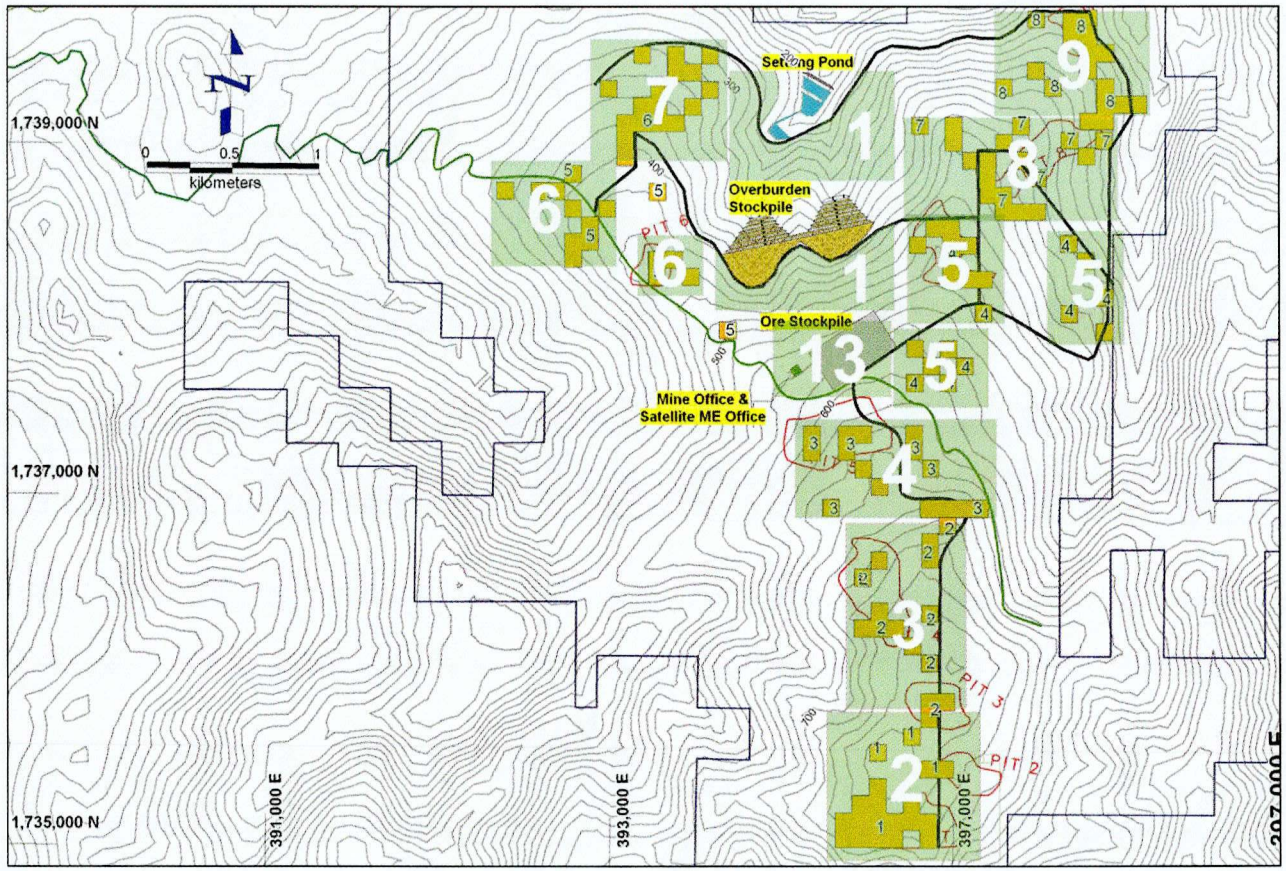
Reforestation sequence in Block 5

1 Reforestation coverage and Sequence

1 Mining Cuts in a Year

Projected reforestation sequence in Block 5

ANNEX 7B

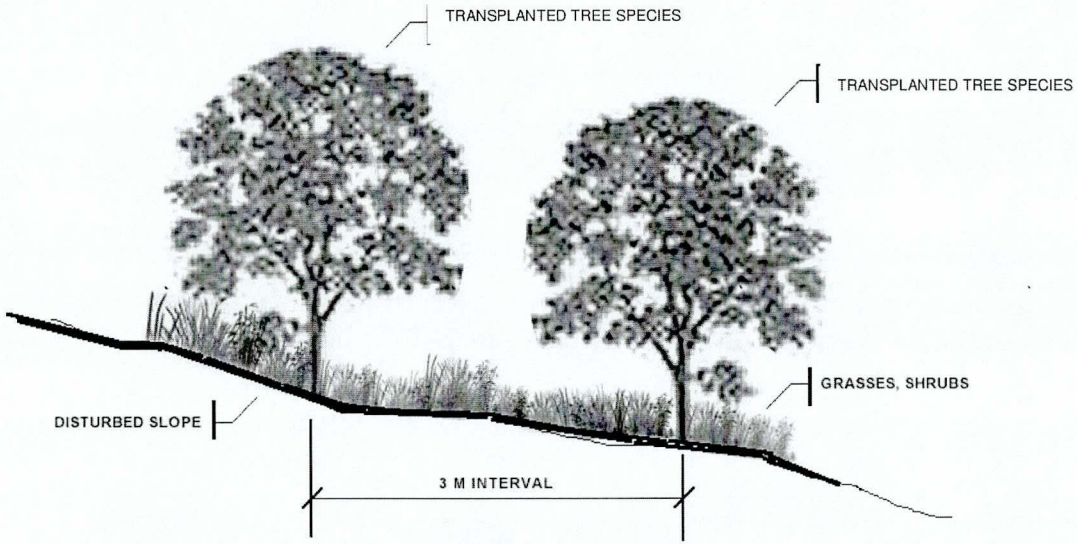


Reforestation sequence in Block 7

1 Reforestation coverage and Sequence

1 Mining Cuts in a Year

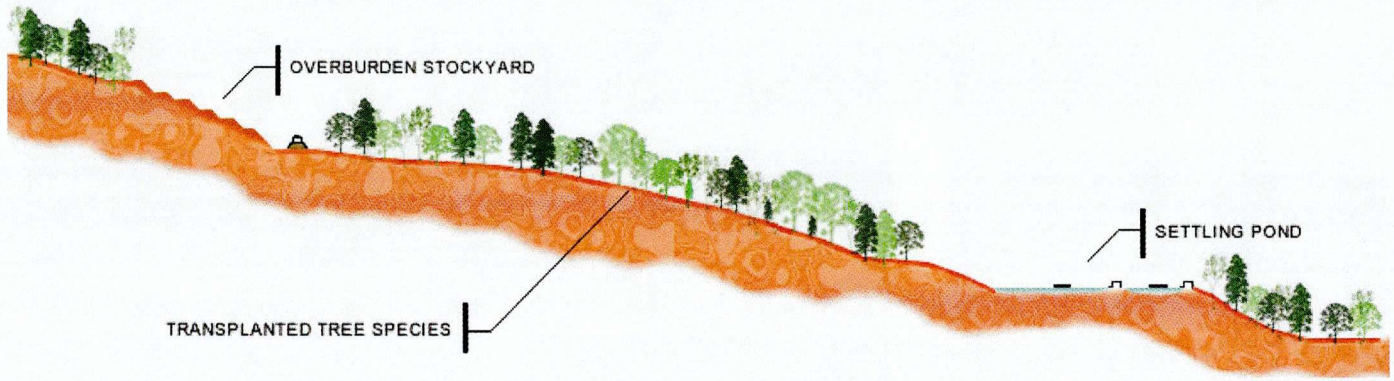
ANNEX 8



DISTURBED SLOPE TERRACING

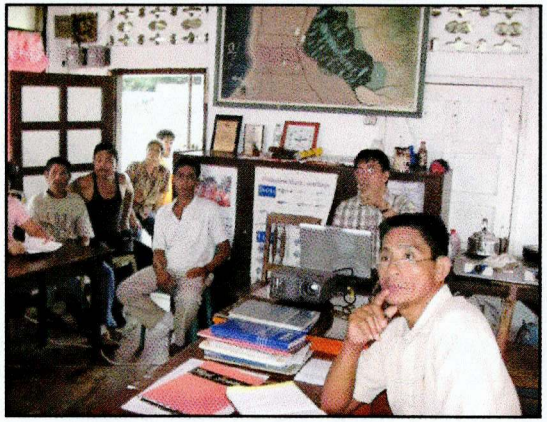
Typical spatial transplanting of tree species

ANNEX 9



Transplanting on the Overburden Stockyard and Settling Pond Area

Photo Documentations



Meeting/Dialogue with LGU's and CENRO

COMMENTS/RECOMMENDATIONS

OF CLRF / TWG

AND

RESPONSES/COMPLIANCES OF EMI

REPLIES TO THE CONTINGENT LIABILITY AND REHABILITATION FUND STEERING COMMITTEE AND TWG COMMENTS

CONTINGENT LIABILITY AND REHABILITATION FUND STEERING COMMITTEE AND TWG COMMENTS

ENVIRONMENTAL PROTECTION & ENHANCEMENT PROGRAM (EPEP)

ENGR. BALOLOY

Page 14: Settling Ponds and Page 35: Surface Water Runoff and Erosion Control Strategies (Page 13)
Response:

The drainage from the mining pit particularly along the haul roads will pass to the different silt traps before it will drain to the series of settling ponds. The size and capacity of these siltation ponds varies with the expected volume of water coming into it. The settling ponds will be constructed along the perimeter of the disturbed areas. These ponds and silt traps will be inspected regularly and desilted as necessary to remove the deposited silt and ensure its desilting capacity. Desilted silts from silts traps and ponds will be sampled. Normally, these silts have high nickel content and will be blended with the ore for shipment. Silt with low nickel content shall be stockpiled and may be used as backfilling materials for rehabilitation.

Page 32: 3.2 Water Resources (Page 12)
Response:

The major potential impact of mining operation on water quality of both surface and marine waters is siltation or increase in the mount of suspended solids (fine silt materials) that are harmful to aquatic life. The magnitude of the impact is highly perceptible since receiving water bodies experience turbidity in the event of a heavy downpour. The operation phase consists of a flurry of activities such clearing, stripping and mining, hauling, piling and hauling of ores to foreign vessel. More areas will be opened up for mining just to meet the annual target. Additional construction and establishment of mine facilities may occur during operation phase which will involve additional earth movement and ground clearings. These activities if not properly managed will further magnify surface runoff, increase water turbidity and sedimentation of water bodies.

The Nayom-Bayto River Irrigation System will not be affected since it is located downstream of the mining operation. The company will construct different silt traps and settling ponds along the strategic locations. These traps and ponds will effectively trap storm water runoff from areas that were already stripped for mining. Creeks that also drains storm water runoff from the surrounding areas will be constructed and equipped with a silt filter to reduce the amount of silts emptying into the creek. Areas around the creek will also be planted with grasses and other vegetative cover to increase the filter of the creek vicinity.

Page 44: I Parameters to be monitored (Page

- Discuss the water quality baseline data in the area

Response:

The water quality within the project area and its periphery are in accordance with the government standards. The company will ensure that thru the plans and programs in this EPEP/FMRDP that contamination of the receiving water bodies will be avoided. Based on the environmental impact assessment of the project area, the results of the quality of the water is within the DENR standard.

Page 51: 6.0 Total Cost of EPEP

- Include the quantity/target and the basis of the annual cost by activity
  See attached matrix

ENGR. ADDAWE

- All maps should be legible and properly labeled to include the following: technical coordinates, meridian, scale, scale bar, and north arrow

Page 25: 3.0 Environmental Impacts and Control

Summary Matrix indicating the resources/activities, potential source, impacts, mitigating measures and cost for all project phases (use/refer to the pro-forma table of EMB) see annex 2.

Annex 2 – Matrix of Environmental Management Plan/Impacts and Mitigating Measures.

Include columns for responsible entity and cost on the Environmental Management Plan;

Resources/Activities	Potential Source	Impacts	Mitigating Measures	Cost	Responsible Entity
Land Resources	Construction of ore stockpile area, mine facilities and stripping of nickel laterite horizon	1. Loss of vegetation 2. Accelerated erosion 3. Siltation of creek and tributaries 4. Stripping of overburden 5. Silt-laden runoff	1. Replanting in stripped/mined-out areas and reforestation in non-mineable areas 2. Restoration and rehabilitation of the mined-out areas will be done progressively with stripping and mining operations 3. Defining the drainage system and construction of drainage canals	Incorporated in the Monitoring Trust Fund (PHP150,000/ quarter)	MGB, EMB, LGU and concerned gov't agencies

			4. Construction of overburden stockpile area 5. Construction of settling ponds		
	Overburden stockpile area	1. Accelerated erosion and siltation 2. Dust generation	1. Defining the drainage system and construction of drainage canals 2. Covered with canvass for protection against rain		
	Beaching area/causeway/pier yard	1. Siltation of creek and tributaries and sea 2. Potential liquefaction	1. Defining the drainage system and construction of drainage canals 2. Construction of ore stockpile area 3. Construction settling ponds		
	Mine site and overburden stockpile area	1. Silt laden runoff 2. Siltation to receiving bodies of water	1. Construction of periphery canals for ore stockyard 2. Defining the drainage system and construction of drainage canals 3. Construction settling ponds		
	Manual crushing and ore stockyard	1. Silt laden runoff 2. Siltation to receiving bodies of water	1. Construction of periphery canals for ore stockyard 2. Defining the drainage system and construction of drainage canals 3. Construction settling ponds		
	Waste generated by elemental analysis	1. Liquid wastes are derived from excess acids used in the elemental analyses of nickel, iron and cobalt analysis	1. All acid wastes will be diluted with water and neutralize with lime in the waste tank prior to disposal to septic tanks 2. Construction of septic tanks		
Noise	Heavy equipment and machineries	Noise generation during operation	1. Periodic maintenance of all earth moving equipment and vehicles 2. Periodic maintenance of powerhouse and pumps and the sealing of all motors to minimize the effect of noise disturbance	Incorporated in the Monitoring Trust Fund (PHP150,000/ quarter)	MGB. EMB, LGU, DOLE and other concerned gov't agencies
	Manual breaking of ore to desired sizes	Noise generation during operation	1. Planting of trees along the boundary line of the premises to serve as sound barriers and to minimize the noise effect in the surrounding areas 2. Provision of ear muffs to workers		
	Operation at causeway/pier yard	Noise generation during hauling, loading and unloading operation	1. Limiting the activity hours in the causeway/pier yard when there is low demand in supply 2. Planting of trees at the perimeter fence of the		

			causeway/pier yard along the boundary line of the premises to serve as sound barriers and to minimize the noise effect in the surrounding areas		
Air quality	Dust generation on stripping operation and haul roads	Generation of fugitive dust	1. Periodic maintenance and water spraying of all hauling route during dry seasons to minimize if not totally eradicate generation of excessive dust due to passing of hauling trucks 2. Trucks loaded with ores shall be covered with canvass or tarpaulin to prevent from escaping to the environment 3. Cleaning of haul trucks to remove soil and silt carryover from the undercarriage and wheel assemblies 4. Limiting the speed of service vehicles, hauling trucks and other heavy equipment	Incorporated in the Monitoring Trust Fund (PHP150,000/ quarter)	MGB. EMB, LGU and other concerned gov't agencies
	Heavy equipment and machineries	Emission from sources	1. Periodic maintenance of all engines either fix or mobile equipment and machineries to minimize occurrence of excessive exhaust gasses coming from diesel powered engines		
	Gaseous waste from laboratory analysis	Harmless gaseous fumes from the digestion chamber during sample extraction that will release to the atmosphere via chimney	1. Monitoring of air quality in the area will be regularly conducted 2. Installation of blowers and exhaust fans		
Social issues	1. Employment to local residents 2. Implementation of the project	1. Hiring of local residents 2. Sources of taxes and livelihood project	1. Positive Impact 2. Positive impact	Incorporated in the Monitoring Trust Fund (PHP150,000/ quarter)	MGB, LGU, DOLE and other concerned gov't agencies

Annex 3 – Matrix of Environmental Monitoring Schedule

Parameters to be monitored and method of monitoring should be specific. Also provide columns for responsible entity and cost.

Activities	Parameters to be Monitored	Method of Monitoring	Location of Monitoring Station	Monitoring Frequency	Cost	Responsible Entity
1. Stripping of	1. Accelerated erosion	1. Ambient air quality sampling	Refer to location map of	Quarterly		MGB, EMB,

overburden and stockpiling at the overburden stockyard area	2. Generation of siltation in receiving bodies of water 3. Generation of fugitive dust 4. Generation of emission from heavy equipment 5. Generation of noise due to mining operation and equipment 6. Vegetation loss	2. Water quality audit 3. Noise level audit 4. Audit of environmental mitigation	environmental monitoring station	basis		LGU
2. Stripping of nickel laterite horizon and hauling to ore stockyard	1. Accelerated erosion 2. Generation of siltation in receiving bodies of water 3. Generation of fugitive dust 4. Generation of emission from heavy equipment 5. Generation of noise due to mining operation and equipment 6. Vegetation loss	1. Ambient air quality sampling 2. Water quality audit 3. Noise level audit 4. Audit of environmental mitigation	Refer to location map of environmental monitoring station	Quarterly basis		MGB, EMB, LGU
3. Manual breaking of ore at the stockyard	1. Generation of fugitive dust 2. Worker's safety and health	1. Ambient air quality sampling 2. Noise level audit 3. Audit of safety and health protection measures	Refer to location map of environmental monitoring station	Quarterly basis	Incorporated in the Monitoring Trust Fund (PHP150,000/ quarter)	MGB, EMB, LGU
4. Hauling of ore to the stockpile area at the causeway	1. Generation of siltation in receiving bodies of water 2. Generation of fugitive dust 3. Generation of emission from heavy equipment 4. Generation of noise due to mining operation and equipment	1. Ambient air quality sampling 2. Water quality audit 3. Noise level audit 4. Audit of environmental mitigation	Refer to location map of environmental monitoring station	Quarterly basis		MGB, EMB, LGU
5. Operation at the causeway	1. Generation of siltation in receiving bodies of water 2. Generation of fugitive dust 3. Generation of emission from heavy equipment 4. Generation of noise due to mining operation and equipment	1. Ambient air quality sampling 2. Water quality audit 3. Noise level audit 4. Audit of environmental mitigation	Refer to location map of environmental monitoring station	Quarterly basis		MGB, EMB, LGU

6. Laboratory analysis	1. Generation of solid and liquid wastes 2. Generation of harmless gaseous fumes	1. Ambient air quality sampling 2. Water quality audit 3. Audit of environmental mitigation	Refer to location map of environmental monitoring station	Quarterly basis		MGB, EMB, LGU
7. Water quality	Turbidity, pH, TSS, TDS, oil and grease, and heavy metals	1. Standard water quality sampling, 2. Laboratory analysis, 3. Ocular inspection, 4. Water level recorder	Refer to location map of environmental monitoring station	Quarterly basis		MGB, EMB, LGU
8. Noise Quality	Noise level	Audiometer/Noise meter	Refer to location map of environmental monitoring station	Quarterly basis		MGB, EMB, LGU
9. Air Quality	SOx, NOx, fugitive particles, Total Suspended Particulates (TSP)	1. TSP will be monitored using high volumetric sampler 2. Installed air quality control device using portable SOx and NOx analyzer	Refer to location map of environmental monitoring station	Quarterly basis		MGB, EMB, LGU
10. Social Issues	Socio-economic effect of the project	Interviews with the affected communities, intensifies information education campaign (IEC)	Directly affected communities	Bi-annual/ Annual basis		MGB, EMB, LGU
11. Flora and Fauna	Species diversity and survival rate of reforestation projects (% of surviving plants per hectare) No. of migratory bird species; other species that will be identified a indicator of environmental conditions in the area; endemic species	Observations and inspections Sampling programs	Rehabilitation/reforestation areas within permitted area	Quarterly basis		MGB, EMB, LGU

Note: Harmless gaseous fumes/wastes come from the digestion chamber during sample extraction

MS. HERNANDEZ

Page 27: Mine waste and overburden stockyards, stockpiling at the pier, and siltation ponds

Response:

Large volume of stripped materials and ores are piled in overburden stockyards and ore stockpiles at the pier for ready shipment. The risk of soil erosion and surface runoff is high particularly during rainy season. Runoff coming from these areas is heavily silted that will eventually end up in creeks and in bodies of water, if not properly controlled or managed, increasing water turbidity and threatening aquatic life. Constant sedimentation of water bodies may eventually cover and dry up the area, destroying its resident biodiversity.

Siltation/settling ponds structures are primarily constructed as pollution control facilities, may still be a possible source of water pollution. These structures impound large volume of runoff and silts. In the event of dike failure, large volume of highly turbid water will flood the receiving water bodies causing sedimentation and loss of aquatic habitat, thereby losing also marine/aquatic flora and fauna in the area.

Page 28: 3.1.2 Control Strategies

- 1st par., 3rd sentence: revise the statement;

Response:

Within the project site, a dramatic change in topography is an unavoidable impact of the mining operation. However, progressive rehabilitation of the mined-out areas using materials previously dumped to overburden stockyards may partly restore the topography. Landform change will also be buffered by delineation of buffer zone undertaken prior to earthmoving works. Mining in parcels will also be followed by progressive rehabilitation. This means that after fully mining-out a particular mine parcel, rehabilitation follows immediately. Earth materials hauled to overburden stockyards will be used to physically rehabilitate the area, consistent with its natural landform whenever possible.

Rehabilitation activities will be implemented as follows:

- All areas affected by the mining operations will be rehabilitated. These include all mining facilities such as stockyards, access and haul roads, settling ponds, and mined-out mine pits;
- Pre-revegetation activities such as re-contouring of land configuration, surface preparation, and soil enrichment will be undertaken prior to actual planting;
- Local species when possible will be used to revegetate the mined-out areas.

While topographic modification is intrinsically unavoidable, the over-all landscape will have better ecological and aesthetic appeal as a result of continuous reforestation activities alongside physical rehabilitation of mined-out areas.

- 2nd par.: discuss how the nursery will be established, area, and kinds of plants to be maintained:

Response:

As part of the company's control strategy, a nursery will be established within the disturb areas to sustain production of seedlings for every planting season. It will cover an approximately 6,000 m^2. It has a 30,000-seedling capacity. Nursery facilities include an office, stockroom, hardening area, and germination shed. The nursery will be maintained throughout the implementation of the final mine rehabilitation and decommissioning of the area. Plan for satellite nursery/ies will be constructed, if the areas for rehabilitation through reforestation will be too far from the main/central nursery.

Page 33: Waste generated by elemental analysis

- Discuss proper storage and handling of the different acids identified thereunder;

Response:

Remaining chemicals will be stored in a double-walled container van to avoid direct contact of its metallic wall with the chemical vapour especially the acid vapor. The container van has concrete racks and footings directly erected from the ground so that when the van deteriorates, the whole rack assembly will not be affected. A water shower and faucet will be installed near the portal of the van to ensure water availability in case of accidental spillages. Mounted at the outside wall will be a fire hydrant. The other hydrant will be located inside the AAS room.

Page 37: 2nd par. (Page 32)

- Check the suitability of ammonia as neutralization agent;

Response:

All acid wastes will be neutralized and treated with lime solution in the treatment tank to eliminate its toxicity and makes its risk-free.

Page 50: 5.0 Research proposal at the minesite (page 43)

Response:

1. Research on the best plant species that will best thrive in the disturbed areas;
   A species survival study will be conducted in mined-out areas to identify the most suitable species for revegetation. Species that will appear to survive in the laterite conditions and are drought-tolerant are mountain agoho, and mangium etc., except the Mindoro pines. These fast-growing species will be interspersed with native species to allow the survival of the latter;
2. Research on the reconverting the idle land into a reforestation project
   Microbial community structure of soils in areas to be mined (overburden) and those not affected by mining will be investigated. These will study the characteristics of the soil quality and identify what various indigenous and fast growing plantation species for reforestation will be planted.
3. Research on the viability of uprooting Mindoro Pine trees and transferring it to other areas and determine its effect on soil quality; and,

4. Pitcher plant is common in laterite areas. It is present in nickel mines in the Province of Surigao, Hinatuan Islands, Dinagat Islands, etc. Research on the transferring and propagation of the pitcher plant will be conducted.

   Since the Mindoro pine is dominant or endemic in the area, this study will focus mainly on the probability of surviving Mindoro pine tree to non-mineable area or possible not in the lateritic soils, while the other research pertaining to pitcher plants is to find out what will be the difference between the soils from Surigao and Zambales considering that it has the same mineralogy.

- **Annex 3:** Matrix of Environmental Monitoring Schedule
  Clarify Page 2, re: generation of liquid waste from acids; method of monitoring – Generation of liquid waste from acids; Method of monitoring – Water quality audit, what is to be incorporated in the audit? Are you going to check for the pH of the liquid waste if it has been neutralized? What gaseous wastes are being discharged? Please clarify?

Harmless gaseous fumes from the digestion chamber during sample extraction are released to the atmosphere via a chimney installed over the digestion chamber, where blowers and exhaust fans are also installed

Technical Working Group (TWG)
EPEP

Page 4: Executive Summary (
2nd par.
Response:
Initial stripping activities will be conducted at Block 5 (1,609.39 hectares) and Block 7 (2,240,042 hectares) with each block operating for a period of twelve (12) years. The partially mineable blocked of EMI encompasses an area of about 208.15 hectares

3rd par.
The estimated capital expenditures of the project is PhP 112,288,314.00 or PhP 112.28M

Page 5: Executive Summary; Page 8:2.1.1 Project Location; Page 13: Mine Facilities; Page 17 Design of the Causeway; and Page 21:2.3.3 Shipping. Exact Location of the causeway?
Response:
The proposed constructions of a pier jetty/causeway in both barangays will still an option of the company. Once the confirmation of the additional reserves in the area located at the southern part (Barangay Uacon, Candelaria) and at the northern part (Barangay Naulo, Sta. Cruz)

will be established then the company will apply for another environmental compliance certificate and permit for the construction of the said structures. For the meantime, the company will be utilizing the Acoje pier through the Municipality of Sta. Cruz.

Page 6: 5th par.
Response:
Additionally, EMI shall adopt the final land use for the nickel mine site in accordance with the DENR reforestation program otherwise known as **"Mining Forest Program (MFP)"**

Page 10: 2.1.2 Estimated Capital Expenditures
Response:
The estimated capital expenditures of the project is PhP 112,288,314.00 or PhP 112.28M which will take care of the labor cost ...

Page 12: 2.1.4 Mining Method
Response:

Page 14: Settling Ponds and Page 34: 3.2.2 Control Strategies
Response:
The settling ponds were designed taking into account its carrying capacity to handle maximum precipitation and stability. To augment silt ponds in order that clear water is discharged into natural waterways, silt dams/traps even back-up settling ponds were built on strategic areas. These silt traps/dams would contain silts not contained by siltation ponds. Also additional settling ponds will be constructed once the confirmation of additional reserves in the area will be established.

Page 16: Stripping of Overburden and Stockpiling and Page 27: Mine Waste and Overburden Stockyards
Response:
Since mining operation will be in parcels, progressive rehabilitation will be followed and implemented. This means that after fully mining-out a particular mine parcels, rehabilitation follows immediately. Earth materials hauled to overburden stockyards will be used to physically rehabilitate the area, thus the holding capacity and even the proposed maximum height of the said stockyards will not be maximized or reached.

Page 20: 2nd par. (4.5% blocks 5 and 7 are not equal to 208.15 ha?

Response:
Out of 4,619.68 hectares, it is estimated that only 120.0 hectares will be disturbed by the project, which translates only 3.11% of blocks 5 and 7.

Page 21: 2.4.1 Power Requirements
Response:

Since the company will not construct a processing plant, only offices, housing and other structures that will require electricity. The power requirement of the project will be supplied by Zambales Electric Company (ZAMECO) through a 37.5 KVA distribution transformer. Standby portable generator sets will also be provided in cases of power outage.

Page 26: Table 3.1-1 Estimated Disturbed Area (Mine Pit Area)

Mine Pit	Hectares
Year 1 & 2 Pit	20.0
Year 3 & 4 Pit	20.0
Year 5 Pit	15.0
Year 6 Pit	15.0
Year 7 Pit	15.0
Year 8 Pit	10.0
Year 9 Pit	15.0
Year 10 Pit	10.0
TOTAL	120.0

Page 32: The MEPEO shall be the lead Office to implement the EPEP and FMR/DP during and after the operation not only responsible for the care and maintenance of the planted trees and the nursery. (Page
Response:
The designated Mine Environmental Protection and Enhancement Office (MEPEO) of EMI will be responsible for the planning and managing the implementation of the approved EPEP/AEPEP, monitoring and evaluating the effectiveness of the mitigating and enhancement measures and also the implementing rehabilitation and abandonment programs.

Page 51:6.0 Total Cost of EPEP
Response:
See Annex E

FINAL MINE REHABILITATION AND/OR DECOMMISIONING PLAN (FMR/DP)

ENGR. BALOLOY

Page 68: A Closure Criteria relating to Mine Infrastructure (Page 64)
All unwanted materials will be removed and disposed are hazardous chemicals and even used fuel or oil.

	Issues	Objectives	Control
B.	Chemical Stability		
	• Fuel and chemical storage areas	• Make area secure	• tanks, piping, bunding, and any oil contaminated structures and materials shall be properly decommissioned and removed from the mining area, observing the correct safety procedures and guidelines • remaining chemicals such as petrochemicals, reagents and other associated chemical will be collected and taken away from the affected areas.

- **Attachments:** Provide readable maps – all attached maps will be provided and attached on the final draft.

ENGR. ADDAWE

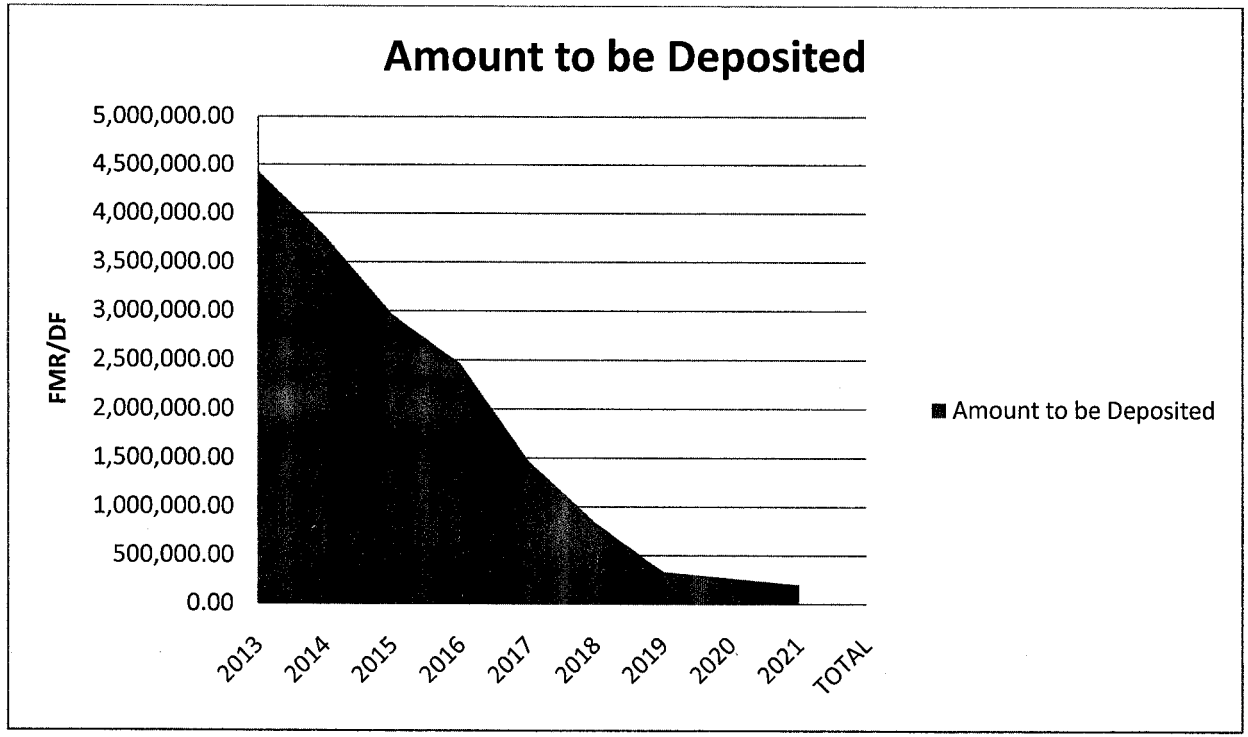
SUMMARY MATRIX

Sources of Impacts	Parameters	Methodology	Frequency	Cost
Pit area	Pit wall and slope stability	Look for tension cracks, gully erosion and other signs of failure	Monthly & Quarterly	
	Pit floor drainage	Look for ponding and scouring	Monthly & quarterly	
	Drainage canals/waterways stability	Inspect all drainage canal for blocks and scour	Monthly & quarterly	
	Water quality	Sampling in-situ for pH and TDS; laboratory analyses for heavy metals and sulfates	Monthly & Quarterly	
Siltation Ponds	Seepage	Sampling in-situ for TDS; see seepage through embankment	Monthly & Quarterly	
	Erosion	Look for gully or erosion	Monthly & Quarterly	

	Emergency spillway	Inspect channel for blocks and scour	Monthly & Quarterly	
	Vegetation	Density cover and regeneration	Semestral & Annually	
	Effluent quality	Look for turbidity; sampling in-situ for turbidity and TDS, laboratory analyses for heavy metals	Monthly & Quarterly	
Causeway, minesite ore stockpiling, drying area, industrial and office area, and fuel tank	Erosion	Look for gully; provide mitigating measures	Monthly & Quarterly	
	Dust	Air Sampling for suspended particulates during windy and dry days	Monthly & Quarterly	
	Vegetation establishment	Density cover and regeneration	Semestral & Annually	
Adjacent and downstream areas	Dust	Air Sampling for suspended particulates during windy and dry days	Monthly & Quarterly	
	Surface water quality	water sampling in-situ for turbidity and TDS; laboratory analyses for heavy metals	Monthly & Quarterly	
	Marine life in the area	Sampling marine plants and animals	Monthly & Quarterly	
			Monthly & Quarterly	
			Monthly & Quarterly	
			Monthly & Quarterly	

11.1.. Schedule of Annual Cash Provisions to the FMRDF (Page 71 & 72)

Year	D.A.O. 2005-07 Factor	Amount to be Deposited
2013	0.265	4,434,790.90
2014	0.225	3,765,388.50
2015	0.177	2,962,105.62
2016	0.147	2,460,053.82
2017	0.088	1,472,685.28
2018	0.050	836,753.00
2019	0.020	334,701.20
2020	0.016	267,760.96
2021	0012	200,820.72
TOTAL		**16,735,060.00**



MS. HERNANDEZ

Page 64: 9.2.2 Temporary Closure and 9.2.3 Sudden or Unplanned Closure. (Provide care and maintenance program (CMP) (Page 58)

Response:

The project components that will be maintained and monitored are the following:

1. Mining area – active area and the haul roads
2. Support facilities of the project – the administration building; motor pool area; guard houses; settling ponds, check and filter dams, stockpile areas and nursery.

The CMP will contain of the following considerations:

1. Notification of stakeholders (employees, LGUs, government agencies and contractors) prior to the starting date of Temporary Closure.
2. The company personnel department will implement appropriate measures for non-essential personnel (notification, possible consumption of remaining leaves, separation pay, etc.)
3. EMI will refer the laid-off non-essential personnel to other projects, if any.
4. When the projects re-opens, qualified laid-off workers will be given preference in hiring.
5. All contractors will be required to secure their designated facilities subject to inspection and clearance from EMI.
6. Mining operations will be temporarily stopped.
7. A general hazard assessment of project areas will be implemented prior to cessation of operations. Corresponding mitigation measure will be implemented.
8. All working/active benches will be stabilized prior to cessation of operations.
9. Drainage system will be checked and maintained periodically to ensure that the natural flow of surface run-off will not be obstructed and drains towards siltation dams.
10. All mining equipment will be positioned in designated parking areas or in the motor pool area.
11. Essential roads will be maintained.
12. All support operations that are necessary for the protection and enhancement of the environment will be maintained.
13. A team composed of heavy equipment operators will be on standby in case their services are required during emergency situations.
14. Adequate security will provided. Only essential personnel will have access to the project area.

Page 70: D Closure criteria relating to settling ponds/runoff catch basin (page 63)

- Clarify treatment of effluent

Response:

No treatment of effluent will be made

Page 72: 10.3.3 Description of any special procedures or precautions to be used safety during decommissioning. (Page 66)

- Provide safety procedures in handling and storing, as well as decommissioning chemical reagents:

Response:

Liquid wastes from various analyses are generally acidic. These wastes are collected and stocked in large plastic pails, covered and discarded to a septic tank lined with plastic sheets. The septic tank is made of concrete and has two compartments. One compartment with concrete flooring is the treatment tank. Liquid wastes that accumulated during the shift water are discarded and are treated with lime solution. Treatment with lime neutralizes the acidic solution and eliminates its toxicity and makes its risk-free.

The other compartment has gravel as its flooring. It is here where the neutralized solutions and laboratory washings are coursed and seeped to the ground.

Harmless gaseous fumes from the digestion chamber during sample extraction are released to the atmosphere via a chimney installed over the digestion chamber, where blowers and exhaust fans should also be installed.

All empty chemical bottles are immediately rinsed with water and disposed it to accredited buyers. As with other glassware for disposal, broken glass tools and are also rinsed by spraying with water, stored in covered tin cans and disposed to accredited buyers. Other solid wastes include that plastic containers, used filter papers, tin cans and cellophanes are disposed in designated dump site at the mine site. Proper handling, storage and disposal will be observed in conformance to R.A. No. 6969 and will be a component of the company's Safety and Health

- Attach MDSs for the chemical reagents

Solutions	AAS Standard Solutions
Acetic Acids	Cobalt Nitrate
Ammonia Solutions	Iron Nitrate
Dioxane	Nickel Nitrate
Ethanol	Manganese Nitrate
Hydrochloric Acid	Solids
Hydrofluoric Acid	Diphenylamine Sulfonic Acid Sodium Salt
Nitric Acid	Potassium Dichromate
Perchloric Acid	Sodium Chloride
Phosporic Acid	Sodium Hydroxide
Sulfuric Acid	Silica Gel
Triethanolamine	Starch
Solids	Tartaric Acid
Aluminum Powder	Tin Chloride
Ammonium Nitrate	Stannous Chloride
Ammonium Chloride	Sodium Acetate Trihydrate
Citric Acid	

Material Safety Data Sheet (MDS) for each chemical indicates the manner of handling and emergency measures during accidental exposure. The Assay laboratory maintains a record of MSDS for each chemical. Emergency responses during chemical accidents are detailed in Occupational Health and Safety Program.

Technical Working Group (TWG)

Page 4: Executive Summary (Page 3)
Response:
2nd par.
Response:
The partially mineable blocked of EMI encompasses an area of about 120.0 hectares

3rd par. (Page 3)
Response:
The estimated capital expenditures of the project is PhP 112,288,314.00 or PhP 112.28M

Page 6: 8th par. (Page 5)
Response:

The implementation, maintenance and monitoring of the FMR/DP will take ten (10) years.

Page 55:7.2 Objectives of Mine Closure (Page 47)
Response:

Objectives of Mine Closures

The company's objectives of mine closure are the following:

1. To have the abandoned/mined-out areas conducive for the vigorous growth of fast growing forest trees and other vegetation suited in the area;
2. To serve as a model in the environmental protection by ensuring harmony with other components of the natural environment in the area;
3. Minimize areas of disturbance during the construction and operational phases;
4. Conduct ongoing studies which will enable best environmental and rehabilitation practice techniques to be developed and implemented when carrying progressive rehabilitation;
5. To leave a legacy that, after mine closure, other sources of livelihood could evolve in the area through implementation of sustainable social development program; and,
6. To comply with all legal requirements.

The said objectives will be attained thru the following:

1. Establishment, as early in the life of the Project, of the final land use which would be a stable re-vegetated mined-out area;
2. Regular consultation with the stakeholders thru continuous conduct of IEC;
3. Establishment of success indicators for closure;
4. Periodic review of the FMR/DP;

   The company will initiate the review of the FMR/DP every two years thereafter from the date of approval. This review may be moved up if changes in mining activities or in the rehabilitation measures chosen justify modifying the plan either at the company's request or if the MGB deems it to be necessary.

5. Conduct of an independent technical review. The company will encourage the conduct of an independent technical review and audit of the entire mine development, operation and closure process. Key focus areas of the mine closure will include, among others:

   - The adequacy of plans for closure;
   - The appraising of success and compliance to the conditions of closure;
   - The adequacy of success indicators; and
   - The identification of residual commitments and planning how to deal with them.

6. Preparation for residual care. During the periodic review of the FMR/DP and at the end of its implementation, the company commits to implement residual care that may be needed/identified in some cases/instances;
7. Building local capacity and avoiding creating a culture of dependency. The company will implement livelihood trainings to prepare the community to become self sustaining after the life of the Project; and,
8. Facilitation of the participation of other development players. The company will still consult with other developmental players like the NGOs and community-based organizations in the area in the planning and implementation of the FMR/DP.

Page 56: Stakeholders Involvement

Response:

Highlights of the results of stakeholders involvement in the FMRDP process/discussions/meetings. (Page 49)

Stakeholders / Date of Meeting/ Dialogue	Highlights of Discussion/Concerns/Issues
CENRO, Masinloc / November 7, 2007	The meeting was conducted at the Office of CENRO – Masinloc, Zambales and was attended by DENR personnel from Forestry Sector, DENR Region 3. The main concern of the DENR Technical personnel was the main tree species to be used in the rehabilitation of mined out areas. It was recommended that Mindoro Pines should be the primary specie to be utilized in the tree planting activity particularly in the upper elevation (around 300 masl and up). Likewise, it was also recommended that seedling nursery must be put up in the area particularly within the locality where Mindoro Pines thrives well.
Municipal Council of Sta. Cruz, Zambales / November 14, 2007	The session was conducted at the Session Hall of Brgy. Poblacion South and was attended by majority of the members of Sangguniang Bayan of Sta. Cruz. The main concerns of the local officials were the implementation of the corporate social responsibility even during the closure period to address socio-economic problems of their constituents that will be directly affected by the cessation of the operation. This is in addition to the timely and proper implementation of rehabilitation activities in the mine affected areas.
Teachers of Lucapon South Elementary School/ December 12, 2007	Dialogue was conducted at the Principal's Office in Lucapon South Elementary School and participated by teachers and selected students. Accordingly, the group's concern is for the company to prioritize the restoration of the mine affected areas and after the life of the project, the company should not neglect its obligation to reforest the mine sites. They prefer reforestation program in the mountainous areas of the company's mineral property.
Brgy. Council of Uacon, Candelaria, Zambales	The meeting was held at the session hall of Brgy. Uacon and attended by majority of the members of the Sangguniang Barangay. The main concern of the council was the guarantee in performing the obligation of the company in rehabilitating mined out areas after the life of the project. It was also suggested that the Barangay constituents should be given priority in the reforestation activities if to be contracted. They prefer reforestation in the upland and agricultural in the low land.
Brgy. Council of Lucapon South, Sta. Cruz, Zambales / January 6, 2008	The meeting was conducted at the session hall of Brgy. Lucapon South and participated by majority of the Brgy. Council. Major concern of the council is the reforestation of the mine affected areas while the area being occupied by ISF beneficiaries should be developed into a vegetable plantation – the original used of the land prior to mining development. Likewise, they requested that haulage road or mine road and other mine structures be donated to the Barangay.
Brgy. Council of Tubo-Tubo South, Sta. Cruz, Zambales /March 17, 2008	The meeting was conducted at the Brgy. Hall of Tubo-Tubo South and attended by majority of the members of the Brgy. Council. It was requested by the council that prior to the closure of the mine, constant consultation be made so that they will be aware of the plans and programs of the company regarding the benefits of their constituents who will be terminated from the employment. It was raised also that the cooperative in their barangay is willing to participate in the reforestation project of the company during the mine closure phase. It was also requested that if possible, service vehicle be donated to them after the life of the project.
Brgy. Council of Guis-Guis, Sta. Cruz,	The meeting was conducted at the session hall of Brgy. Guis-Guis and majority of the Brgy. Council was present. Main concerns are environmental protection of the source of water at Sitio. Ingmalpay and the construction of farm to market road. In case the

Zambales / April 12, 2008	farm to market road shall be used by the company as mine road, they requested that after the life of the project, it will be donated to the barangay for their constituents used.
Brgy. Council of Guinabon, Sta. Cruz, Zambales	The meeting was conducted at Guinabon Barangay Hall and was attended by majority of the Brgy. Council. Focused of the discussion on issue of final mine rehabilitation and decommissioning plan were the benefits of the laborers who will be affected by the closure of the mine and the transformation of the mined out areas into a productive post land use such as fruit tree plantation, enhancement of forest tree plantation area and development of watershed for source of water for irrigation and domestic use. It was also emphasized that there should be a continuous dialogue and consultation prior to mine closure between the company and the local people thru the Barangay Officials.
Brgy. Tubo-Tubo North, Sta. Cruz, Zambales	Main concern of the local officials of Tubo-Tubo North is the preservation of the downstream water which is being used as irrigation for rice and vegetable plantation. The council requested that they should be given regular updates of the companies operation and the environmental protection measures and activities in their area of jurisdiction.

Page 58: 9.0 Risk Assessments

- Prioritize the identified risk and present in a matrix format for easy reference. (Page 52, 54 & 55)

Response:

Sources of Risks

Sources of Risks - **Safety**

The Risk	What & How It Can Happen	The Consequences of An Event Happening	Existing/proposed Controls	Consequences Rating	Likelihood Rating Considering Controls	Level of Risk
Falls from benches	Non-observance of safety precautions, unsafe acts/conditions	Body injury or death	Implementation of the Safety and Health Program (SHP), conduct of relevant safety trainings and seminars. Daily safety briefing (PEP talks)	5	E	H
Hit by falling rocks from upper benches/slides	Unstable slopes, Non-observance of safety precautions, unsafe acts/conditions, no PPE	Body injury or death	Implementation of the SHP, conduct of safety trainings and seminars. Putting safety signage. Use of PPEs. Daily safety briefing	5	E	H
Trips and slips	Non-observance of safety precautions,	Body injury/muscul	Implementation of the SHP, conduct of safety trainings and	2	D	L

	unsafe acts/conditions	ar stress	seminars. Putting safety signage. Use of PPEs. Daily safety briefing			
Dust exposure	Lack of PPE	Shortness of breath, respiratory illness, eye injury	Implementation of the SHP, conduct of safety trainings and seminars. Putting safety signage. Use of PPEs. Daily safety briefing	2	D	L
Noise	Exposure to high level of noise	Hearing impairment	Implementation of the SHP, conduct of safety trainings and seminars. Putting safety signage. Use of PPEs. Daily safety briefing	3	D	M
Bump by moving equipment	Unsafe acts, unsafe condition, lack of training	Body injury, death	Implementation of the SHP, conduct of safety trainings and seminars. Putting safety signage. Use of PPEs. Daily safety briefing	5	E	H
Caught between moving parts	Caught by moving equipment	Body injuries	Implementation of the SHP, conduct of safety trainings and seminars. Putting safety signage. Use of PPEs. Daily safety briefing	4	D	H
Vehicular accidents	Reckless driving, poor maintenance of vehicle, lack of safety warning devices	Body injury, death	Implementation of the SHP, conduct of safety trainings and seminars. Putting safety signage. Use of PPEs. Daily safety briefing. Only authorized persons will be allowed to drive.	5	E	H
Sources of Risks - **Environment**						
Increase in disturbed area for rehabilitation under the FMR/DP	Non-conformance to progressive rehabilitation and poor maintenance of rehabilitated areas	Increase cost for rehabilitation	Implementation of the EPEP. Conduct of progressive rehabilitation and maintenance of rehabilitated areas	3	E	M
Excessive dust generation	It can be wind generated dust	Dust will significantly impact the visual amenity, safety of personnel and smothering of	Setting of speed limits and periodic road spraying. Covering of truck loads for long range hauling	2	C	M

		vegetation.				
Water pollution	Cleared and open areas are prone to erosion that will cause siltation	Siltation of nearby water bodies	Maintenance of drainage system and siltation ponds and silt traps	2	C	M
Stop operation due to natural calamities	Catastrophic events like typhoon, earthquake, etc.	Stoppage of operation	Emergency response program	3	E	M
Failure of the FMR/DP	Lack of management support (operational and financial)	Incomplete and meager rehabilitation of the affected areas	Funding and technical mechanism provided under by the FMR/DP and the FMR/DF	3	E	M
Noise pollution	Excessive noise associated with decommissioning of vehicles and equipment	Disturbance to nearby communities	No blowing of horns in crowded areas (schools, community, etc). periodic maintenance of vehicles and equipment. Use of PPEs by personnel	2	C	L
Failure of pollution control devices (silt ponds)	Poor maintenance	Siltation of nearby water bodies	Maintenance of silt ponds and drainage system	2	D	L

Sources of Risks - Social						
Increase of a Ceased and Desist-Order (CDO)	Stoppage of the decommissioning and rehabilitation due to non-compliance with regulatory requirement	Stoppage of the decommissioning and rehabilitation works. Penalties. Filing of court cases (criminal and damage suits)	Implementation of the approved FR/DP and compliance to government regulations	5	E	H
Increase in anti-project sentiments	Unpopularity of the decommissioning	Can lead to barricades, rallies,	Implementation of the SDMP during operations. Harmonized relationship with the host	3	E	M

	and rehabilitation due to poor Project-Host Community relationship	delays in the decommissioning and rehabilitation	community. IEC campaign			
Strained relationship with the LGUs	Unpopularity of the decommissioning and rehabilitation due to poor Project-LGU relationship	Can lead to barricades, rallies, delays in the decommissioning and rehabilitation	Implementation of the SDMP during operations and the approved FMR/DP. Harmonized relationship with the LGUs. IEC campaign	3	E	M
Stop operation due to security problems (terrorist acts, communist, etc.)	Terrorist/communist attacks	Stoppage of the implementation of the FMR/DP	Close coordination with the PNP. Harmonized relationship with the host community	3	E	M
Peace and order problems due to temporary closure	The loss of income for the residents due to the closure of the project can lead to peace and order problems	Increase in crime rate, pilferage, theft of company properties, vandalism	Implementation of the SDMP during operations. Conduct of IEC to improve relationship with the host community	3	E	M
Care and maintenance status of operations due to low market demand	Low cement price will cause the care and maintenance of the Project	Stoppage of operation	Dialogue with stakeholders. Conduct of IEC	3	E	M
Failure of the host community to progress as a whole, after the closure of the project	The loss of income for the residents due to the closure of the project can lead to slow down of economic activities for the community	Migration	Successful implementation of the SDMP establishing alternative livelihood projects. Dialogue with stakeholders. Conduct of IEC	3	E	M

Page 63: Last Paragraph

Response:

For Block 5, the approximate area to be disturbed by the mining operation is 50.0 hectares while in Block 7 it is assumed that the disturbed area is 70.0 hectares for a total of 120.0 hectares. By the end of the mine life, it is assumed that 85% of the mined-out area (or 102.0 hectares has already been rehabilitated during the EPEP period of implementation. (Page 56 & 57)

Page 66:

Table 6-1 Final Land Use for each Project Component (Page 59)

Project Component	Final Land Use	Area After Mine Life of 12 Years
Mining Area Slopes Pit Floor	**Mining Area** Stabilized Slopes Leveled Area and Tree Plantation for various species of endemic and non-endemic tree species	120.0 hectares

Page 67: 10.2 Mine closure criteria and performance standards for all identified mine components. Tabulate the success closure criteria.....

Mine Environmental Protection Structures (MEPS) (Page 60)

Settling Ponds	Leveled surface and tree plantation areas	6.0 ha.
Drainage canals	Well maintained drainage canal	0.0033 ha.
Seedling Nursery	Well maintained seedling nursery	0.03
	Sub-Total for MEPS	6.033 ha
	Grand Total	**169.343 ha**

Response: (Page 62)

Mining Component	Final Land Use	Methods/Approaches/Strategies	Success Closure Criteria
Mining area	Revegetated Area	This will entail using the materials from the waste dump, soil conditioning, planting with endemic species and maintenance works May be placed under DENR's Community Based Forest Management (CBFM) program	80% survival rate and self thriving plants
Facilities such as	Donated to	Facilities/structures that are usable will be donated to	Deed of donation

staff house, parking area, laundry, water tank, motorpool area, powerhouse, nursery, contractor's yard, assay laboratory	community	the community. Non-usable facilities will be dismantled and the materials removed from the site. Fixed facilities that can be used by the community will not be removed. Those that are not required are to be removed and their footprint rehabilitated. To be done after the life of the MPSA is attained. It must be emphasized that the company may opt to renew the MPSA for another 25 years.	
Siltation ponds	Revegetated area	All siltation ponds in the mining area will be maintained until full rehabilitation of the mined-out parcels. As rehabilitation is progressive, settling ponds that are no longer required will be decommissioned and rehabilitated. The excavated materials, may in the future have economic value; otherwise, these will used for backfilling, grading or removed from the site. May be placed under DENR's Community Based Forest Management (CBFM) program	80% survival rate and self thriving plants
Haul roads and mine access roads	Retained for access	If considered useful by the community, internal haul road can be left. If not required, these will be re-planted; water diversion measures will be installed for run-off interception and to enhance revegetation. Signs, guard rails and barriers will be removed or retained depending upon the consultation with the stakeholders.	Usable roads
Unused laboratory chemicals and wastes	removed	Remaining chemicals such as petrochemicals, reagents, and other associated chemicals will be collected and taken away from the affected areas. Due to the progressive waste disposal policy, residual waste will be minimal.	Removed from site

Page 75: Details of Maintenance and Monitoring Plan. Present in a matrix format for easy reference. (Page 70)
Response:

Component	Mitigating Measures
Within the Project Area	Maintain good housekeeping at all working place and records all activities conducted
Mining structures	Monitor siltation control measures particularly the stability of the siltation ponds and

	drainage system
Air. water and noise quality	Monitor air, water, noise quality in the project area
Safety and health	Monitor compliance of workers on wearing PPE
Monitoring of hazardous materials	Maintenance and monitor hazardous wastes (used oil, used batteries, mercury bulb and chemical reagents) storage area
Disposal of solid wastes and hazardous materials	Monitor collection, segregation and proper disposal of solid wastes and hazardous materials
Haul and access roads	Maintain and monitor the drainage system Regular spraying of roads Monitor the traffic management plan
Mined-out areas	Annual assessment of vegetation to check the growth rate, survival and mortality Stability of the siltation control facilities
Social plan	Monitor the effectiveness of social package plan

Page 76: 10.5.1 Maintenance and monitoring program and procedures..... Review the figure of the mined-out area and indicate measurable accomplishment.....

Response:

10.5.1 Maintenance.....

a. mined-out areas – **120.0 hectares** (Page 70)

11.0 schedule of operations and costs (Page 71)

Description Project Activity	Activity (Unit)	No. of Units to Complete Rehabilitation Progressive .....about **85%** of the disturbed areas equivalent to 102.0 hectares Remaining disturbed areas for backfilling & leveling: mined-out area = 18 hectares; settling ponds = 6 hectares, for a total of 24 hectares.	Unit Cots to rehabilitate (PhP)	Cost to Complete Each Activity (PhP)

Page 76: 2nd par. Schedule of Operations and Costs

Response:
This will cover the implementation of FMR/DP activities up to relinquishment for a period of ten (10) years after closure. That is three (3) years for rehabilitation and decommissioning activities and five (5) years for monitoring and maintenance and another two (2) years for government environmental audit and final relinquishment.(Page 71)

- Clarify if a third party and inflation were considered in the formulation of cost estimates.
  Response:
  The cost estimates considers the present value. Nevertheless, the periodic review of the FMR/DP every two (2) years will provide the proper venue for the consideration of inflation and adequacy of the FMR/DP. (Page 71)

- Clarify if there are any Technological Advances that were considered in the formulation of the FMR/DP
  Response:
  No technological advances were considered in the formulation of the FMR/DP. In case there will be any that will help in the successful implementation of the FMR/DP, EMI will avail of such technical advances. (Page 59)

- Clarify if there are unique circumstances faced by the company during its operation that may affect the implementation of the FMR/DP;
  Response:
  At the moment, there are no identified unique circumstances that may affect the implementation of the FMR/DP. (Page 59)

- Provide discussion on the specific assets and services to be transferred (what specific assets to be transferred? And to whom? MOA of transfer? Including, among others, maintenance and safety procedures;
  Response:

  The transfer and social assets and services will depend on the outcome of the consultation with the stakeholders in the future. Facilities such as staff house, parking area, laundry, water tank, motorpool area, powerhouse, nursery, can be transferred to the LGU after the life of the MPSA. (Page 65)

Pit Number	Reserve	Life	Year to be Rehabilitated
Block 5	3,499,824 DMT	12	After the life of the mine
Block 7	4,285,449 DMT		

- Using the above, please indicate the rehabilitation/measures to be undertaken if temporary or sudden closure will be encountered, taking into account, among others, the drop in metal prices, peace and order, etc. also indicate where will the fund be sourced
  Response:
  see (Page 56 & 57)

- Provide a matrix to properly identify the components to be rehabilitated and the measures to be undertaken including the cost to achieve the perceived restoration. (Page 60)
  Response:

Project Component	Mitigating measures	Cost
Slopes Pit Floor	Stabilized slopes Leveled area and tree plantation for various of endemic and non-endemic species	
Stockpiles areas	Decommissioning entails the re-contouring of the area to conform to nearby landmass using mine wastes and topped off the top soils with available vegetative and organic waste materials	
Siltation Ponds	All siltation ponds in the mining area will maintained until full rehabilitation of the mined-out parcels. As rehabilitation is progressive, settling ponds that are no longer required will be decommissioned and rehabilitated. The excavated materials may, in the future, have economic value; otherwise, they will be used for backfilling or grading or will be removed from the site.	
Haul roads & mine access roads	If considered useful by the community, internal haul roads will be left behind; if not, these will be replanted. Water diversion measures will be installed for runoff interception & to enhance revegetation. Signs, guard rails & barriers will be removed or retained depending on consultation with the stakeholders. Roads & hard stands that will neither be needed for the decommissioning works nor useful to the community will be permanently blocked or revegetated as part of the rehabilitation activities.	
Motor pool & equipment maintenance areas	These will be decommissioned, the areas cleaned, any contaminated topsoil removed, & the ground leveled & re-contoured prior to its revegetation.	
Drainage channels, canals &/or culverts along the roads	These will be left behind to intercept runoff & deflect it towards the ditches, instead of flowing down the road surface, in order to prevent erosion & allow faster reestablishment of vegetation on the road.	
Fuel oil storage facilities	Tanks, pipings, bundings & any oil-contaminated structures & materials will be decommissioned & removed from the mining areas following the proper safety procedures & guidelines.	
Facilities such as personnel quarters, warehouse, workshops, storage areas, nursery, recreation facilities, & staff houses	Facilities/structures that are usable will be donated to the community. Non-usable facilities will be dismantled, the materials removed from the site, & their footprint rehabilitated.	

Port facilities	The port belongs to a private firm, the DMCI; hence, it will be up to DMCI what it plans for the property.	
Unused laboratory chemicals & wastes	Remaining chemicals such as petrochemicals, reagents, & other associated chemicals will be collected & removed from the areas. Due to the progressive waste disposal policy, residual waste will be minimal.	

- Provide a full copy of the MPSA and ECC. See attachment.
  A copy of the MPSA and ECC will be provided and attached on the final draft.

- Provide the company's structure/organization that will be responsible for the implementation of mine closure activities. Specify the specific number of personnel to man the implementation and the specific responsibilities of each identified personnel in implementing the plan.
  Response:

  The MEPE Office will continue to exist for the rehabilitation of the area and some retrenched workers will be utilized/participated in the reforestation/rehabilitation activities in the decommissioning stage. The said Office will also continue to host the regular MMT monitoring for the compliance of the ECC conditionalities even during Closure period. As such, a monitoring matrix for this plan shall be formulated and agreed the Mine Rehabilitation Fund Committee (MRFC) that shall form part as basis for MMT monitoring aside from the ECC. The number of personnel to man the implementation of the plan is one (1) environmental officer, one (1) safety officer and one (1) community relations officer. However, the total workers for each specific areas of work will be determined before the closure of the mine. (Page 70)