

CORNER	LATITUDE	LONGITUDE
1	9 - 20 - 00.00	125 - 54 - 30.00
2	9 - 20 - 30.00	125 - 54 - 30.00
3	9 - 20 - 30.00	125 - 54 - 00.00
4	9 - 21 - 15.00	125 - 54 - 00.00
5	9 - 21 - 15.00	125 - 52 - 45.00
6	9 - 21 - 30.00	125 - 52 - 45.00
7	9 - 21 - 30.00	125 - 52 - 30.00
8	9 - 21 - 45.00	125 - 52 - 30.00
9	9 - 21 - 45.00	125 - 51 - 45.00
10	9 - 22 - 00.00	125 - 51 - 45.00
11	9 - 22 - 00.00	125 - 51 - 30.00
12	9 - 24 - 46.00	125 - 51 - 30.00
13	9 - 24 - 46.00	125 - 52 - 30.00
14	9 - 25 - 00.00	125 - 52 - 30.00
15	9 - 25 - 00.00	125 - 52 - 15.00
16	9 - 26 - 00.00	125 - 52 - 15.00
17	9 - 26 - 00.00	125 - 52 - 30.00
18	9 - 26 - 30.00	125 - 52 - 30.00
19	9 - 26 - 30.00	125 - 53 - 00.00
20	9 - 23 - 30.00	125 - 53 - 00.00
21	9 - 23 - 30.00	125 - 53 - 30.00
22	9 - 24 - 00.00	125 - 53 - 30.00
23	9 - 24 - 00.00	125 - 53 - 45.00
24	9 - 24 - 15.00	125 - 53 - 45.00
25	9 - 24 - 15.00	125 - 54 - 15.00
26	9 - 24 - 00.00	125 - 54 - 15.00
27	9 - 24 - 00.00	125 - 54 - 40.00
28	9 - 23 - 50.00	125 - 54 - 40.00
29	9 - 23 - 50.00	125 - 54 - 50.00
30	9 - 22 - 55.00	125 - 54 - 50.00
31	9 - 22 - 55.00	125 - 55 - 15.00
32	9 - 23 - 15.00	125 - 55 - 15.00
33	9 - 23 - 15.00	125 - 55 - 30.00
34	9 - 20 - 00.00	125 - 55 - 30.00

AREA = 4547.7630 HAS.

**SKETCH PLAN**  
TEMPORARY  
EXPLORATION PERMIT APPLICATION

**CTP CONSTRUCTION & MINING CORP.**

GARRASCAL, SURIGAO DEL SUR  
AREA 4547.7630 HAS.  
SCALE = 1:50000

*Reynato A. Filarca*  
**REYNATO A. FILARCA**  
GEODETIC ENGINEER  
PTR NO. 5309477  
DATE = 11-02-07  
REG. NO. 2909  
DATE = 11-01-19-68

Province: Chartered City  
Municipality:  
A. Province of Surigao  
B. Province of Agusan

**ONE (1) YEAR**

**EXPLORATION WORK PROGRAM**

Republic of the Philippines  
Department of Environment and Natural Resources  
**MINES AND GEOSCIENCES BUREAU**  
North Avenue Diliman, Quezon City

**ONE(1) YEAR**  
**EXPLORATION WORK PROGRAMME**  
**APSA NO. 0000-104- XIII**

**1.0 NAME OF AND ADDRESS OF COMPANY/PROPONENT**

Proponent: **CTP CONSTRUCTION AND MINING CORPORATION**

Address: No. 11 President Avenue  
B. F. Homes, Paranaque City  
Metro Manila  
Philippines

Contact Person: Clarence T. Pimentel  
President

Contact No. Tel. (02) 842-5441  
Fax. (02) 842-5441

**2.0 LOCATION OF PROJECT (SPECIFY GEOGRAPHIC COORDINATES)**

The project area is situated in:

Barangay : Ban-Ban, Panikian, Babuyan, Pantukan, etc.  
Municipality : Carrascal  
Province : Surigao del Sur  
Island : Mindanao

Technical Description

The area is within the following geographic coordinates:

Corner	Latitude	Longitude
1	9°20'00"	125°54'30"
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33	9°23'15"	125°55'30"
34	9°20'00"	125°55'30"

Please refer to the attached NAMRIA map 1:50,000 scale complete with technical description.

### 3.0 AREA OR SIZE OF COVERAGE (HECTARES)

The project area is located in the northeasternmost part of Surigao del Sur, It has an area of Four Thousand Five Hundred Forty Seven and 7630/10000(4,547.7630) hectares.

### 4.0 PROJECT AREA DESCRIPTION

#### 4.1 Terrain/Physiography

The area is characterised by gently sloping narrow ridges separated by deep broad ravines or valleys. Elevation ranges from 55-435 masl (meters above sea level).

#### 4.2 Accessibility

The project area is located about 120 kilometers southeast of Surigao City. Accessibility is through a 50-kilometer concrete National Highway then by a 70-kilometer gravel-paved road, which traverses the eastern coasts of Surigao del Norte and Surigao del Sur. Travel time is about three (3) hours from Surigao City to the project area.

Surigao City can be reached from Manila through regular flights via Asian Spirit or by a normal voyage of SuperFerry and Sulpicio Lines. In addition to this, daily voyage (except Monday) of Cokaliong is available from Cebu.

### 4.3 Drainage System(s)

The principal drainage systems consist of Marga River and Tagoan River on the north and Pantucan River on the south. These main drainage rivers exhibit radial pattern running towards Carrascal Bay.

### 4.4 Vegetation

Most of the lateritic terrain areas are already denuded. Although there are some areas that are semi-barren or covered with thin vegetation. Densely forested areas are commonly found farther inland or in limestone regions. Iron wood, *Gleichenia linearis* or locally called "hagsam", and a type of tropical tree called "pagospos" pre-dominate in the semi-barren areas.

### 4.5 Land Use

The project area was subjected to logging in the past. However due to the poor topsoil condition, re-growth of substantial timbers did not progress but with only light to medium secondary scrubs that are constantly harvested by small scale timber cutters for firewood. Most of the villages and towns are located in the floodplains and coastal areas.

## 5.0 DESCRIPTION OF ONE(1) YEAR EXPLORATION PROGRAM

The purpose of the one-year Exploration Program is to upgrade the south deposit area(s) to a Partial Feasibility Study status with respect to resource estimation procedures and calculations.

During the first year the proponent will undertake field exploration work, including appropriate road construction, drilling and surveys that will improve the confidence in the resource.

The table below shows the differences between the previous and proposed exploration work programs.

Previous Exploration Program	Proposed Exploration Program	Remarks
Geologic Mapping	Geologic Mapping	The previous geologic mapping was reconnaissance to semi-detailed and covered the whole EP area. The proposed one is detailed, which will concentrate only on the mineralized areas delineated by previous exploration works.
Auger Drilling	Core Drilling	The previous drilling program is only by auger drilling machine and was limited to the limonite layer of the south deposit. It was aligned along the ridge while the proposed one is to grid at 50x50m intervals using core drilling machine to include the saprolite.
None	Topographic Survey	Topographic survey is very important in resource/reserve estimate, mine planning/designs and locating the drill sites and other geological features. This will be carried out in the proposed program.

## 5.1 Topographic Survey

### 5.1.1 Coverage

The survey would extend across the prospective areas of interest covering approximately 3,550 hectares and the following activities will be conducted:

- Establish horizontal and vertical control stations within the area to be explored that will be derived from the cadastral and land survey control stations.
- Locate all drill hole collars, test pits, access route and existing trails or road traversing the project area.
- Locate several tie points for all geological data (outcrops, lithologic contacts, structures, etc.) and plot on relevant base and topographic maps.

### 5.1.2 Scale and contour intervals

Sufficient survey control will be necessary to plot geological information gathered down to scales of 1:2,500. This precision will allow meaningful contouring down to an interval of as low as 5 meters.

### 5.1.3 Duration

The use of a portable GPS unit will be continuous throughout the exploration period. However a detailed topographic survey, carried out by a reputable professional surveyor, will be necessary during the feasibility study.

### 5.1.4 Manpower complement

Contract survey crews headed by a licensed surveyor, survey aide, computer plotter with local hires will likely be required. Survey instruments will be rented.

### 5.1.5 Estimated cost

The estimated cost is approximately PhP 413,000.00

Cost Center	Quantity	Unit	Unit Cost	Amount
General	1.00	lot	50,000	50,000
Surveyor (4 pax)	30.00	days	2,000	60,000
Field Assistant (12 pax)	30.00	days	3,600	108,000
Grid Survey	30.00	kilometer	1,500	45,000
Hole Survey	60	kilometer	1,500	90,000
Drafting	3	months	20,000	60,000
Total				413,000

## 5.2 Detailed Survey or Studies

### 5.2.1 Detailed geological mapping

Previous geological mapping was conducted at a regional scale from reconnaissance to semi-detailed. Reconnaissance mapping delineated the different lithologies or rock types within the MPSA area. Subsequently, semi-detailed geological mapping was able to delineate the thick and thin limonite areas and this was later followed up by drilling on a 100m-grid interval.

within the delineated areas will be plotted on a detailed map on 1:2,500 scale. Correlation and interpretation done from previous works will be reflected on this detailed map that will include lithology, structures and thickness of limonite.

Geological mapping will cover the most prospective area using tape and compass techniques along un-mapped portions, grid lines and new outcrops exposed by exploration activities.

Expected output will be a report and relevant detailed geological maps showing the delineated thickness of laterite based on drilling and mapping.

### 5.2.2 Coverage

The extent of the area to be assessed is approximately 233 hectares.

### 5.2.3 Duration

Detailed mapping will take four (4) months to finish. This will be conducted prior and during the early stage of the proposed drilling program. All new findings will be carried over or added to the previous data that were gathered to come up with an updated geological map and report.

### 5.2.4 Manpower complement

Manpower required will be one geologist, one geologic aide and local guides when necessary.

### 5.2.5 Estimated cost

The estimated cost will be PhP 310,500.00.

Cost Center	Quantity	Unit	Unit Cost	Amount
General (Miscellaneous)	3	months	50,000	150,000
Field Assistant (2 pax)	30	day	600	18,000
Drafting	2	months	20,000	40,000
Soil and Rock Sampling				
1. Sample Prep	100	samples	75	7,500
2. Assaying/Analyses	100	samples	800	80,000
3. Sample Freight	200	kg	75	15,000
Total				310,500

## 5.3 *Subsurface Investigation*

Previous exploration on the project has identified several areas for the development of mineralised nickel laterite deposits. The first year activity will be focused on the south deposit area, which will include a definitive core drilling program.

As part of the drilling program the following activities will take place:

- Preparation of the drilling sites.
- Accurate surveying of drill hole collar positions using GPS equipment.
- Systematic determination of specific gravity and moisture content.
- Progressive rehabilitation of drill sites.
- Progressive review of results.

### 5.3.1 Drilling

Drilling will be contracted out to a registered company with drill rigs having requisite depth capacities e.g. comparable to Koken. NQ will be the principal core diameter (45mm) as this yields the most suitable sample volume. The contractor shall exert all efforts to maximize core recovery. Core will be analysed for (Ni, Co, Fe, Mg, Si and Al). Proper quality measures will be included in the sampling. This will consist of duplicate, control and check sampling.

### 5.3.2 Number and depth

The detailed core drilling program will cover an area of about 45 hectares. Approximately nine hundred and forty seven (181) holes will be drilled at 50-meter spacing which will result to a total run of about 2,715 meters, if a 15-meter depth per hole is accomplished on average.

### 5.3.3 Estimated number of samples

The samples to be analysed will be taken for every meter and the number of samples will depend on the total meterage drilled, plus a total of at least fifteen (15) percent for duplicate and check samples. The minimum number of samples is therefore estimated to be at least 2,905.

Routine analysis will be conducted in Manila by Ostrea and some quality checks will be carried out by other reputable local laboratories such as Mcphar or Intertek.

### 5.3.4 Estimated cost

The estimated cost for the drilling program will include access road construction, camp, field management, contract drilling, contract sampling and analytical costs.

The total estimated cost is about P 11,830,600.00.

Cost Center	Amount
Access Road Construction	2,400,000
Camp Cost	1,024,000
Field Management	1,574,000
Drilling	4,200,320
Sampling/Analysis	2,632,280
Total	11,830,600

## 5.4 Preparation of Reports

Reports will be prepared and submitted according to government regulations and regular reports will be compiled to update concerned parties on the progress of the exploration activities.



## 6.0 TOTAL ESTIMATED EXPLORATION COST (PESOS)

A summary of the total estimated costs for the exploration program is shown in the following table.

Cost Element	Quantity	Unit	Unit Cost	PhP
<b>CAMP COST</b>				
<b>Camp Construction</b>				
1. Base Camp	50	sq. meter	3,000	150,000
2. Core House	20	sq. meter	3,000	60,000
3. Fly Camp	20	sq. meter	2,000	40,000
<b>Camp Equipment</b>				
1. Oven (Sample Dryer)	1	unit	25,000	25,000
2. Sample Trays	200	pcs	75	15,000
3. Pulverizer/Crusher	2	unit	10,000	20,000
4. Sample Prep Table	2	unit	10,000	20,000
5. Weighing Scale	1	unit	2,000	2,000
6. Core Boxes	200	pcs	400	80,000
7. Cooking Stove	1	unit	2,000	2,000
8. Petromax	2	unit	1,000	2,000
<b>Camp Furniture</b>				
1. Kitchen Utensils	1	set	10,000	10,000
2. Tables and Chairs	1	set	20,000	20,000
3. Beds and Accessories	2	set	30,000	60,000
<b>Camp Supplies</b>				
1. Field Supplies				
a. Sample Prep Supplies	2	months	10,000	20,000
b. Core Checker Supplies	2	months	20,000	40,000
2. Office supplies	2	months	5,000	10,000
3. Personal Protective Equipments	5	set	5,000	25,000
<b>Power</b>				
1. Electricity	2	months	30,000	60,000
2. Water	2	months	10,000	20,000
3. Fuel	2	months	50,000	100,000
<b>Food/Accommodation</b>	3	months	30,000	90,000
<b>Labor</b>				
1. Camp Laborer (5 pax)	3	months	39,000	117,000
2. Driver (1 pax)	3	months	12,000	36,000
<b>Total</b>				1,024,000
<b>FIELD MANAGEMENT</b>				
General	3	months	50,000	150,000
Project Staff				
1. Project Geologist	1	months	80,000	80,000
2. Geotechnician	1	months	50,000	50,000
3. HSEC Supervisor	1	months	35,000	35,000
4. Corporate Social Responsibility Officer	3	months	25,000	75,000
5. Asistant CSRO	3	months	15,000	45,000
6. Environment Officer	3	months	25,000	75,000
7. Health and Safety Inspector	3	months	25,000	75,000
8. Laiason Officer	3	months	12,000	36,000
9. Administrative Officer	3	months	25,000	75,000
10. Accountant	3	months	20,000	60,000
11. Secretary	3	months	12,000	36,000
Communication/IT	3	months	50,000	150,000
Community Affairs	3	months	50,000	150,000
Health and Safety	3	months	40,000	120,000
HSEC Seminar/Workshop	1	events	50,000	50,000
Environment and Rehabilitation	3	months	40,000	120,000
Corporate Social Responsibility (CSR)	3	months	40,000	120,000

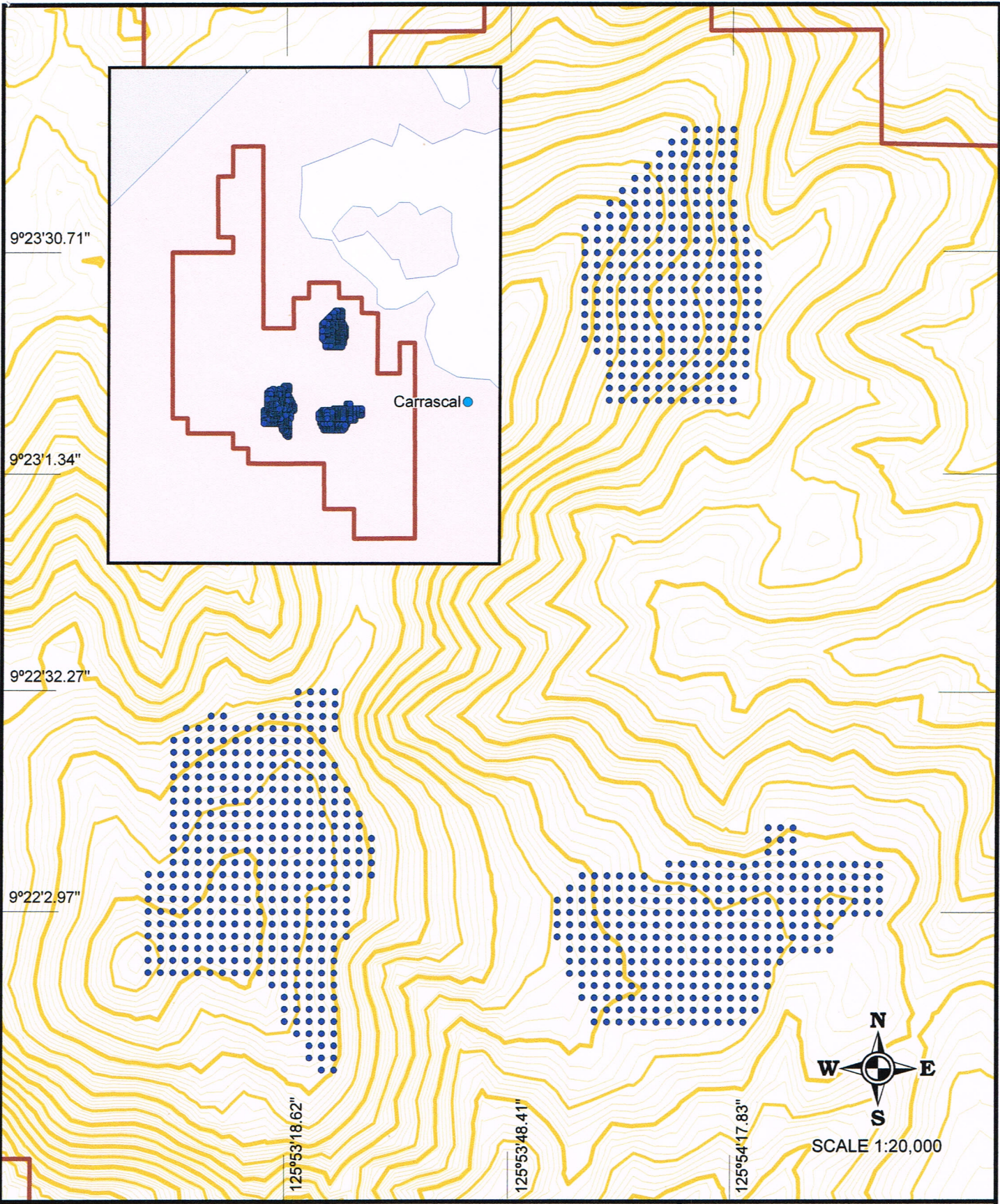
Cost Element	Quantity	Unit	Unit Cost	PhP
<b>GEOLOGIC MAPPING</b>				
General (Miscellaneous)	3	months	50,000	150,000
Field Assistant (2 pax)	30	day	600	18,000
Drafting	2	months	20,000	40,000
Soil and Rock Sampling				
1. Sample Prep	100	samples	75	7,500
2. Assaying/Analyses	100	samples	800	80,000
3. Sample Freight	200	kg	75	15,000
Total				310,500
<b>SITE SURVEY</b>				
General	1	lot	50,000	50,000
Surveyor (4 pax)	30	days	2,000	60,000
Field Assistant (12 pax)	30	days	3,600	108,000
Grid Survey	30	kilometer	1,500	45,000
Hole Survey	60	kilometer	1,500	90,000
Drafting	3	months	20,000	60,000
Total				413,000
<b>DRILLING</b>				
Access Road Construction (2 units BD)	1	month	1,200,000	2,400,000
General	2	months	90,000	180,000
Core Checker (2 pax)	90	days	1,000	90,000
Asst. Core Checker (2 pax)	90	days	600	54,000
Drilling Cost	2715	meters	1,000	2,715,000
Mob/Demob to the site	8	rigs	50,000	400,000
Hole to hole transfer	173	transfers	2,000	346,000
12% VAT for Drilling Contract				415,320
Total				4,200,320
<b>SAMPLING</b>				
Sampling Consumables	2	months	20,000	40,000
Sample Prep Technician (1 pax)	60	days	500	30,000
Sample Prep Assistant (2 pax)	60	days	600	36,000
Assaying/Analyses	2715	samples	800	2,172,000
Duplicate Sample Assaying/Analyses	135.75	samples	800	108,600
Check Sample Assaying/Analyses	54.3	samples	800	42,055
Sample Prep	2715	samples	75	203,625
Total				2,632,280
<b>GRAND TOTAL</b>				<b>12,554,100</b>

## 7.0 MAP ATTACHMENTS

Figure 1: Location of the CTPCMC EPA Property, Mindanao, Philippines.

Figure 2: Exploration Drilling Program.





**LEGEND:**

- - Drill Holes
- Contour Lines
- Claim Boundary

**Exploration Drilling Program of  
CTP-Carrascal Nickel Project**

CONSTRUCTION  
Road Office  
Carrascal, Carrasco Island  
Buenos Aires, Uruguay, República del Sur  
T.E. No. 999-222248


MINING CORP.  
Eastern Office  
No. 22, Penedas Street,  
B.P. House, Pinarqueles City

**8.0 GANTT CHART**

Table 1 – Gantt Chart

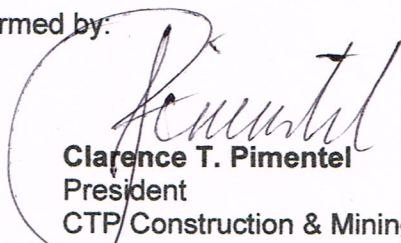
**9.0** Person preparing the exploration work program, please specify PRC Licence and PTR numbers.

Prepared by :



**Carlos V. Escaño**  
Mining Engineer  
PRC License No.: 2379  
PTR No. 0300054  
Dated: January 8, 2007  
Issued at: Makati City

Conformed by:



**Clarence T. Pimentel**  
President  
CTP Construction & Mining Corporation

**ONE (1) YEAR**

**ENVIRONMENTAL WORK  
PROGRAM**

Republic of the Philippines  
Department of Environment and Natural Resources  
**MINES AND GEOSCIENCES BUREAU**  
North Avenue Diliman, Quezon City

**ONE(1) YEAR  
ENVIRONMENTAL WORK PROGRAMME  
APSA NO. 000-104- XIII**

**1.0 NAME OF AND ADDRESS OF COMPANY/PROPONENT**

Proponent: **CTP CONSTRUCTION AND MINING CORPORATION**

Address: No. 11 President Avenue  
BF Homes Paranaque City  
Metro Manila  
Philippines

Contact Person: Clarence T. Pimentel  
President

Contact No. Tel. (02) 842-5441  
Fax. (02) 842-5441

**2.0 TYPE AND NATURE OF PROJECT**

**2.1 Project Description (objectives, schedule and cost)**

The proposed project involves the Partial Feasibility Study components of an exploration program in relation to the nickel laterite deposit within the application for Mineral Production Sharing Agreement Area.

These will include detailed core drilling, geological mapping, a detailed topographic survey and independent resource estimation.

The proposed exploration program will initially take one (1) year to complete at an estimated cost of **PhP 12,554,100.00**

The Environmental Work Program on the proposed project will have the following objectives:

- To undertake management and mitigating measures to prevent damage of the environment during the exploration period.
- To prevent pollution of all drainage systems during the exploration period.
- To institute measures to prevent damage to the flora and fauna in the areas where exploration is being conducted.
- To restore and rehabilitate all disturbed areas affected by exploration activities.
- These environmental concerns will be addressed during and after the completion of the exploration program.

The proponent will set aside at least P 1,255,400.00 annually for the restitution and maintenance of the environment during this period.

## 2.2 *Type and Nature of Mineral Deposit*

The mineral deposit to be evaluated is a nickel laterite deposit which is prospective for significant quantities of nickel, cobalt and iron minerals. In the event of the estimation which may result to an economic deposit during the partial feasibility, the project may go through further activities which will involve construction and mine development.

## 3.0 LOCATION AND SIZE OF CONTRACT PROJECT AREA

### 3.1 *Location and accessibility*

The project area is located about 120 kilometers southeast of Surigao City. Accessibility is through a 50-kilometer concrete National Highway then by a 70-kilometer gravel-paved road, which traverses the eastern coasts of Surigao del Norte and Surigao del Sur. Travel time is about three (3) hours from Surigao City to the project area.

Surigao City can be reached from Manila through regular flights via Asian Spirit or by a normal voyage of SuperFerry and Sulpicio Lines. In addition to this, daily voyage (except Monday) of Cokaliong is available from Cebu.

### 3.2 *Size of contract area*

The project area is located in the northeasternmost part of Surigao del Sur, It has an area of Four Thousand Five Hundred Forty Seven and 7630/10000 (4,547.7630) hectares.

#### Technical Description

The area is within the following geographic coordinates:

Corner	Latitude	Longitude
1	9°20'00"	125°54'30"
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33	9°23'15"	125°55'30"
34	9°20'00"	125°55'30"

### 3.0 DESCRIPTION OF THE EXISTING ENVIRONMENT

#### 4.1 Land Environment

##### 4.1.1 Topography/Physiography

The project area is characterised by gently sloping narrow ridges separated by deep broad ravines or valleys. Elevation ranges from 55-435 masl (meters above sea level).

##### 4.1.2 Land use/capability

The project area was subjected to logging in the past. However due to the poor topsoil condition, re-growth of substantial timbers did not progress but with only light to medium secondary scrubs that are constantly harvested by small scale timber cutters for firewood. Most of the villages and towns are located in the floodplains and coastal areas.

##### 4.1.3 Pedology

The classification of soil within the project area is hutton (red type) and some fernwood (grey and pale brown sands). The topsoil is dark to light red and yellow laterite, approximately 1meter wide.

#### 4.2 Water Environment

##### 4.2.1 Water quality

There is no utilization of the ground water in the area and there is no obvious source of pollutants as the headwaters of the drainage system are uninhabited.

The water quality of the drainage system, coastal areas and groundwater will be monitored at regularly during the exploration period to ensure that water quality standards are maintained.

#### **4.2.2 Hydrology**

Drainage system in the area is characterized by short consequent streams grading to insequent streams which flow intermittently or seasonal. Due to their low volume and low flow rate, these streams have limited use.

Unconfined groundwater occurs in secondary porosities in the igneous rocks and in unconsolidated alluvial deposits in the area. In areas where the rocks are heavily fractured and/or faulted, storage for groundwater is favourable.

#### **4.2.3 Climatology/Meteorology**

The area experienced pronounced wet season, and less dry period with an average of less than 250mm per month from April to September, rising up to 600mm per month over December and January. Temperature ranges from 24.1 – 29.6°C with an average of 27.1°C.

Baseline noise level of about 30 decibels is perceived at the proposed project site, which is unpopulated. This is within the national ambient standard of 55 decibels for residential areas during the daytime.

### **4.3 Geological/Geomorphologic Environment**

Most of the project area is underlain by Late Cretaceous Ultramafic rocks, which are associated with metavolcanics. Younger Tertiary sediments and limestone overlies the ultramafics and have undergone extensive erosional process leaving small discredited erosional remnants.

The ultramafic rocks comprise a complexly mixed suite of dunites and peridotite. Serpentinization is pervasive, but is best developed along shear zones, fractures and faults. Dolerite dykes are noted, but are not common.

The nickeliferous laterite cover is part of the Samar-Surigao segment of the Bicol-Eastern Mindanao Ophiolite belt. The most important factor in the formation of this deposit is the favorable tropical chemical weathering of the ultramafic rocks where breakdown of the primary minerals takes place. Migration and residual concentration of nickel, iron and cobalt into distinct laterite zones consequently occur.

### **4.4 Biological Environment**

#### **4.4.1 Terrestrial plants and animals**

Generally, the project area is poorly vegetated and consists mostly of a secondary to tertiary growth trees such as 'pagospos', lawa-an, magkuno, tiga and suha-suha. Some orchids and pitcher vines were also noted. Plant species

identified belong to the families Poaceae (grasses) and Fabaceae (legumes) which exist predominantly.

The existence of fauna in the area is rare. However, at least 26 species of birds were noted on the adjacent Adlay area. The most common specie belongs to the dove or pigeon family. In addition 10 mammalian species were identified, mostly bats, rats, squirrels and wild pigs. Reptiles such as snakes and lizards were also observed.

#### **4.4.2 Marine plants and animals**

The Contract Area is mountainous and therefore marine life is not an issue.

### **4.5 Socio-economic Environment**

#### **4.5.1 Demography**

Barangay Ban-ban, Panikian, Babuyan and Pantukan are located within the MPSA application area and the primary local industries are fishing and farming. Most of the housing facilities are of light materials and have an average area of 36 square meters. Only a few multi-bedroom semi-concrete houses are present. The average annual income of the household is about P 20,000 – P 50,000. At present, the exploration project site has no community.

#### **4.5.2 Manpower**

The project offers short and perhaps long term employment opportunities for its personnel. Indirect employment opportunities e.g. services, shall likewise be generated.

Preference shall be given to local employees during the exploration period and this should generate more income for local community and social uplifting and development.

#### **4.5.3 Transportation**

Road linking Surigao City to the project site is a combined concrete and gravel-paved finished. It is passable by any motorized vehicles. The town of Carrascal has a wharf and can be accessed easily by motorized boats.

#### **4.5.4 Housing and community infrastructure**

Income generated from local employments helped the improvement of the community infrastructures such as residential houses and communication facilities.

Electricity is supplied by the National Power Corporation and the bulk of the water is obtained from springs.

#### **4.5.5 Educational, health, safety and social services**

The majority of the barangays in the coastal areas near the project site have public elementary schools. In addition Adlay and Carrascal have public high schools, while College education and vocational courses can be attained only at Surigao City, Cantilan and Tandag.

The leading causes of morbidity in the area are pneumonia, cough, cold, anaemia, bronchitis and skin problems. Health clinics are located in Adlay and Carrascal while hospitals are in Surigao City and Tandag.

The proponent has a strict policy on the maintenance and development of health, safety, environmental and community standards. The implementation of these internationally recognised standards will enhance the social and community development of the local populace through training, employment opportunities and participation in the planning process for future development of the area.

It is also the proponent's long term objective to promote and support sustainable community development projects, which may include education, health and housing projects.

#### **4.5.6 Lifestyle**

At present, the region adjacent to the project area consists mostly of underdeveloped coastal communities. Average incomes are very low and the primary means of livelihood is fishing and minor farming. Roman Catholicism is the predominant religion and services are always attended.

Social interaction and gathering during feast days are normal tradition in the area.

Socio-economic issues in the area include:

- Underdeveloped agricultural potential.
- Limited employment opportunities.
- Inability to develop natural resources due to a lack of technical and financial support.
- Lack of basic support facilities for farming and fishing.

## **4.0 DESCRIPTION OF EXPLORATION WORK**

### ***5.1 Description of Exploration Methods and Equipment***

The proposed exploration program will be done systematically and the following activities will be conducted at different stages:

- Establishment of field camps and infrastructure.
- Detailed geological mapping.
- Topographical surveys.
- Detailed core drilling of the prospective nickel laterite deposits in the EPA Area.
- Progressive rehabilitation of drill hole and campsites.
- Initial environmental base line studies.
- Geological and environmental evaluation reports.

Equipment used during the exploration period will include GPS instrument and transit for surveys and man-portable drilling rigs for the drilling program. The use of the rigs will guarantee minimal disturbance to the environment since only foot trails will be developed as form of access for the mobilization of the rigs as well as minimal clearing of the drilling areas which is sufficient for the set-up of the rigs and also enough space for working area.

Initial environmental baseline study will be conducted to identify the existing site conditions and potential environmental problems that may confront the project in the future. In addition, the baseline data that will be gathered from this assessment will also be used in the preparation of a full blown environmental study which is necessary in securing an Environmental Compliance Certificate (ECC) from the Department of Environment and Natural Resources (DENR). This activity will be carried out during the implementation of the exploration program and the results will be submitted to the MGB.

### 5.2 Processing of Samples

Core and rock samples collected during the exploration program will undergo appropriate initial preparation on site including drying, crushing and pulverising. The prepared samples will then be placed in plastic bags and sent to Manila at regular intervals for the analysis of nickel, cobalt, iron, silica, magnesium and aluminium.

### 5.3 Maps and Plans

Appropriate maps and plans will be prepared and progressively updated at scales between 1:2,500 and 1:25,000. These maps will include features such as geology, drill hole locations, roads, environment and local infrastructures.

### 5.4 Estimated Cost

A summary of total estimated cost for the exploration program is shown in the table below.

Cost Element	Quantity	Unit	Unit Cost	PhP
<b>CAMP COST</b>				
<b>Camp Construction</b>				
1. Base Camp	50	sq. meter	3,000	150,000
2. Core House	20	sq. meter	3,000	60,000
3. Fly Camp	20	sq. meter	2,000	40,000
<b>Camp Equipment</b>				
1. Oven (Sample Dryer)	1	unit	25,000	25,000
2. Sample Trays	200	pcs	75	15,000
3. Pulverizer/Crusher	2	unit	10,000	20,000
4. Sample Prep Table	2	unit	10,000	20,000
5. Weighing Scale	1	unit	2,000	2,000
6. Core Boxes	200	pcs	400	80,000
7. Cooking Stove	1	unit	2,000	2,000
8. Petromax	2	unit	1,000	2,000
<b>Camp Furniture</b>				
1. Kitchen Utensils	1	set	10,000	10,000
2. Tables and Chairs	1	set	20,000	20,000
3. Beds and Accessories	2	set	30,000	60,000
<b>Camp Supplies</b>				
1. Field Supplies				

b. Core Checker Supplies	2	months	20,000	40,000
2. Office supplies	2	months	5,000	10,000
3. Personal Protective Equipments	5	set	5,000	25,000
<b>Power</b>				
1. Electricity	2	months	30,000	60,000
2. Water	2	months	10,000	20,000
3. Fuel	2	months	50,000	100,000
<b>Food/Accommodation</b>	3	months	30,000	90,000
<b>Labor</b>				
1. Camp Laborer (5 pax)	3	months	39,000	117,000
2. Driver (1 pax)	3	months	12,000	36,000
<b>Total</b>				1,024,000
<b>FIELD MANAGEMENT</b>				
General	3	months	50,000	150,000
Project Staff				
1. Project Geologist	1	months	80,000	80,000
2. Geotechnician	1	months	50,000	50,000
3. HSEC Supervisor	1	months	35,000	35,000
4. Corporate Social Responsibility Officer	3	months	25,000	75,000
5. Asistant CSRO	3	months	15,000	45,000
6. Environment Officer	3	months	25,000	75,000
7. Health and Safety Inspector	3	months	25,000	75,000
8. Laiason Officer	3	months	12,000	36,000
9. Administrative Officer	3	months	25,000	75,000
10. Accountant	3	months	20,000	60,000
11. Secretary	3	months	12,000	36,000
Communication/IT	3	months	50,000	150,000
Community Affairs	3	months	50,000	150,000
Health and Safety	3	months	40,000	120,000
HSEC Seminar/Workshop	1	events	50,000	50,000
Environment and Rehabilitation	3	months	40,000	120,000
Corporate Social Responsibility (CSR)	3	months	40,000	120,000
Security	3	months	24,000	72,000
<b>Total</b>				1,574,000

Cost Element	Quantity	Unit	Unit Cost	PhP
<b>GEOLOGIC MAPPING</b>				
General (Miscellaneous)	3	months	50,000	150,000
Field Assistant (2 pax)	30	day	600	18,000
Drafting	2	months	20,000	40,000
Soil and Rock Sampling				
1. Sample Prep	100	samples	75	7,500
2. Assaying/Analyses	100	samples	800	80,000
3. Sample Freight	200	kg	75	15,000
<b>Total</b>				310,500
<b>SITE SURVEY</b>				
General	1	month	50,000	50,000

Surveyor (4 pax)	30	days	2,000	60,000
Field Assistant (12 pax)	30	days	3,600	108,000
Grid Survey	30	kilometer	1,500	45,000
Hole Survey	60	kilometer	1,500	90,000
Drafting	3	months	20,000	60,000
Total				413,000
<b>DRILLING</b>				
Access Road Construction (2 units BD)	1	month	1,200,000	2,400,000
General	2	months	90,000	180,000
Core Checker (2 pax)	90	days	1,000	90,000
Asst. Core Checker (2 pax)	90	days	600	54,000
Drilling Cost	2715	meters	1,000	2,715,000
Mob/Demob to the site	8	rigs	50,000	400,000
Hole to hole transfer	173	transfers	2,000	346,000
12% VAT for Drilling Contract				415,320
Total				4,200,320
<b>SAMPLING</b>				
Sampling Consumables	2	months	20,000	40,000
Sample Prep Technician (1 pax)	60	days	500	30,000
Sample Prep Assistant (2 pax)	60	days	600	36,000
Assaying/Analyses	2715	samples	800	2,172,000
Duplicate Sample Assaying/Analyses	135.75	samples	800	108,600
Check Sample Assaying/Analyses	54.3	samples	800	42,055
Sample Prep	2715	samples	75	203,625
Total				2,632,280
<b>GRAND TOTAL</b>				<b>12,554,100</b>

## 6.0 IDENTIFICATION OF POTENTIAL ENVIRONMENTAL EFFECTS

### 6.1 *On Land*

- Access road - Repairs to and construction of access roads from the national highway to the field camps will require periodic maintenance, and strict controls will be established to prevent erosion and any damage.
- Foot trails - The clearing and brushing of foot trails and traverses leading to exploration workings and drill hole sites will cause minimal damage to the surrounding vegetation.
- Field camps - The construction of field camp and drill sites will require some clearing and levelling of the ground and vegetation.
- Topographic survey – This activity will be conducted by a reputable professional survey contractor to ensure that they have the modern equipments that can use in the entire program. The potential effect on the environment is the clearing of vegetation but using the modern survey equipments, this can be minimized due to the following reasons:
  1. No need of chain/tape in traversing.
  2. Can get the shape of the topography using the electronic measuring device even at far.

In addition, the areas that will be covered by topographic survey were once forested but now are almost deforested due to logging. However, due to the poor topsoil condition, re-growth of substantial timber has not occurred with only light to medium secondary shrub that is constantly harvested by small-scale timber cutters for firewood.

- Detailed geological mapping – Detailed mapping will be undertaken along creeks and ridges using compass and tape. The potential effect on the environment is minimal as the clearing of grass and shrubs could be avoided by using the existing trails.
- Core drilling - The use of man-portable drilling rigs will warrant that there is minimal disturbance such as the clearing of vegetation for the drill pads (1x1 meter) and soil excavation for stage. Establishing the grid lines for the core drilling sites will also contribute to a minor environmental impact, as some vegetation will be cleared for this purpose. The water that will be used for drilling will somehow give minor contamination on soil but it will be assured that recycling will be implemented through provision of water tanks/ponds in each drill sites.

During this exploration period there will be no excavation of test pits or trenches. Few excavations and test pits from previous exploration will be backfilled and the surrounding areas will be rehabilitated.

In all instances camps and drill hole sites will be progressively rehabilitated.

### 6.2 *On Hydrology and Water Quality*



The quality of the surface and ground water will not be affected as the work is only in the exploration stage. The surface and ground water quality will be monitored regularly through appropriate chemical tests.

### **6.3 On Ecology**

Minimal surface disturbance to the ecological state of the exploration area is likely to occur due to the nature of the exploration program as described previously. There will be some local damage due to the clearing of foot trails, campsites and drill sites, however great care will be imposed to prevent erosion and to progressively and systematically rehabilitate these areas.

### **6.4 On Socio-Economic Effects**

The lifestyle of the community may generally be described as rural Filipino and is characterised by a simple and honest way of living.

Because of its limited scale, initial implementation of the exploration program will not cause a drastic change in the culture and lifestyle of the community. In fact the project is perceived to have a positive socio-economic impact on the local populace due to employment and added income benefits.

Unless new economic activities are introduced to and developed in Carrascal and the surrounding towns, there will be no growth in the area to be expected. There are four general prospects for economic growth; improved farming, fishing, tourism and mining. These will require an infusion of investments and the Surigao Nickel Project may be appropriate opportunity for this.

## **7.0 ENVIRONMENTAL MANAGEMENT MEASURES TO BE ADOPTED**

Preservation of the ecology and social/cultural environment is very important for the local populace and the proponent.

The following measures must be implemented in order to minimize or prevent any negative impact to the environment:

- Repair and construction of access roads, trails and traverses leading to various working and exploration sites.
- Revegetation and/or reforestation activities will be carried out on the cleared areas, ground slopes and areas devoid of vegetation in coordination with the Forest Management Bureau and the local populace.
- All drill and field campsites will be progressively rehabilitated and open for inspection to all concerned parties.
- Cutting of trees and vegetation will be avoided as much as possible.
- Avoid setting fires and prohibit the hunting of wild life.
- All campsites will maintain strict sanitary conditions.
- Compensation for crop damages will be made according to prescribed rates at the provincial assessor's office.

- Establishment and continual monitoring of environmental stations.
- Implementation of an environmental baseline study.
- Establishment of good community relations through information drives and dialogue.

The following measures will also be undertaken to maximize the socio-economic benefits from the project:

- To provide both short and long term employment.
- Job preference will be given to local residents to limit the number of migrant workers.
- Salaries, allowances and other benefits, as provided by law, will be duly given to the proponent's employees.
- Cooperation and assistance will be extended for the training, health and safety needs of employees and their dependants.
- Cooperation and assistance will be extended in relation to the local housing and community infrastructure needs.
- All exploration related safety regulations must be strictly observed to protect and preserve the health of the employees.
- The project proponent shall faithfully pay its taxes and other financial obligations to the local and national government.
- Through consultation and dialogue with local and regional officials, the proponent shall participate in worthwhile community development projects.

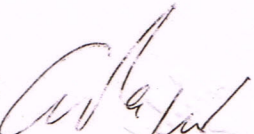
The project proponent will set aside an amount of ~~P1,255,400~~ as annual expenses for the rehabilitation of damaged areas.

## 8.0 ATTACHMENTS

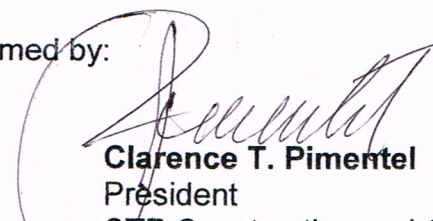
- Environmental Summary Matrix
- Gantt Chart

9.0 Person preparing the exploration work program, please specify PRC Licence and PTR numbers.

Prepared by:

  
**Carlos V. Escaño**  
Mining Engineer  
PRC License No.: 2379  
PTR No. 0300054  
Dated: January 8, 2007  
Issued at: Makati City

Conformed by:

  
**Clarence T. Pimentel**  
President  
CTP Construction and Corporation

## ENVIRONMENTAL SUMMARY MATRIX

AREA	SOURCE	POTENTIAL EFFECT	MITIGATING MEASURES (COMMITMENT)	BUDGET
<p>Outside the Project Area</p>	<p>Restoration or upgrading of access routes from the main highway.</p>	<p>Loss of vegetation</p>	<p>Use existing access tracks as much as possible.</p>	<p style="text-align: center;"><b>P 300,000.00</b></p>
		<p>Siltation/turbidity</p>	<p>Put up settling ponds and/or sediment traps where it is deemed necessary.</p>	
		<p>Erosion</p>	<p>Provide proper drain channels and direct the flow to siltation/sediment traps;</p>	
		<p></p>	<p>Promote the growth of grasses/shrubs along roadsides and over the stockpiles to prevent it from erosion; Conduct regular road maintenance.</p>	
<p>Renovation of basecamp and construction of sample house.</p>	<p></p>	<p>Domestic and laboratory waste generation</p>	<p>A waste segregation scheme will be introduced to encourage recycling and to lessen the volume of waste generation.</p>	<p style="text-align: center;"><b>P 600,000.00</b></p>
		<p></p>	<p>Biodegradable waste will be dumped in pits, which will be covered with soil and revegetated before site abandonment.</p>	
<p>On the Project Area</p>	<p>Excavations (for settling ponds, camp construction, core drilling, drill pad preparation)</p>	<p>Depression of selected areas due to excavations</p>	<p>Backfill the area immediately after target completion.</p>	<p style="text-align: center;"><b>P 600,000.00</b></p>
		<p></p>	<p>Revegetation or reforestation after project completion but before abandonment to give ample time for rehabilitation measures maintenance.</p>	
		<p>Proliferation of insects particularly mosquitoes</p>	<p>Proper drainage shall be provided to prevent accumulation of water from any excavation.</p>	
		<p>Entrapment of stray animals or accident to by-passers.</p>	<p>Immediate backfilling of excavations upon work completion. Provide warning devise/signs to as safety reminders to by-passers. Immediate backfilling of excavations upon work completion.</p>	

AREA	SOURCE	POTENTIAL EFFECT	MITIGATING MEASURES (COMMITMENT)	BUDGET
	Excavations (for settling ponds, camp construction, core drilling, drill pad preparation)	Loss of vegetation	<p>Maintain and/or establish a nursery during the exploration program for progressive rehabilitation.</p> <p>As much as possible the natural specie of the area will be maintained.</p>	
	Excavation	Siltation	<p>Immediate backfilling of test pits and trenches and plugging of drill holes immediately after the desired samples are taken or after the study are completed.</p>	
	Use of drilling chemicals	Water and soil contamination	<p>Biodegradable drilling fluids shall be used as much as possible.</p> <p>Refuelling areas shall be provided with bunds and lined with impervious materials to prevent soil contamination.</p> <p>Water recycling will be implemented through provision of water tanks/ponds in each drill sites.</p>	P 100,000.00
Hydrology and Water Quality	Camping	Contamination of river water due to generation of human related waste	<p>Campsites will be located at least 100 meters away from creeks and/or river system and it will be provided with proper latrine facilities.</p> <p>A waste segregation scheme will be introduced to encourage recycling and to lessen the volume of waste generation.</p> <p>Biodegradable waste shall be buried in pits while non-recyclable non-biodegradable waste shall be brought out of the site for disposal at the Municipality's designated dumpsite.</p>	

AREA	SOURCE	POTENTIAL EFFECT	MITIGATION MEASURES (COMMITMENT)	BUDGET	
Ecology	Clearing of vegetation and noise generation	Displacement/loss of flora and fauna	Vegetation clearing will be avoided as much as possible and noise generation will be kept to its barest minimum.	P 100,000.00	
	Waste generation	Loss of rare species of flora fauna Foul odor, health problem, water pollution, visual nuisance, may displace sensitive flora and fauna	Areas identified as special habitat of flora and fauna will be avoided and its existence will be reported to concerned government agencies. A specific site away from any source of water will be designated for waste dumping, organic waste will be buried in pits while the inorganic waste will be collected and taken out of the site for possible recycling or disposal to Municipal dumpsite.		
Socio-economic effects	Project implementation	Displacement of socio-economic activities	Promote employment opportunities by giving local residents priority on job available in relation to this project. Provide a just compensation to private property owners that may be disturbed by the project.	P 155,400.00	
	Misinformation on project implementation	Disharmonious relationship between the residents and the contractor	Conduct IEC activities before the project implementation to keep the personnel, residents and the LGU well-informed of the programs of the company. Keep an open communication with the community through a conduct of regular meetings to give an update on the status of the project. Meet the community after the project has been accomplished to give them the information with regard to the findings and future company plans involving the area, if there is any.		
	Movement of vehicles	Dust generation	Road maintenance shall be conducted regularly. Table drains at water prone areas shall be provided and growth of vegetation shall be encouraged to prevent erosion. Trees shall be planted at roadsides deemed to be used even after the life of the project.		
	Unsafe working condition	Health hazards to workers	All employees shall be provided with protective equipment and proper medical attention will be accorded to them regularly. Training on safety and proper equipment handling shall be provided to all personnel.		
	Increase of migration	Disharmonious relationship with residents and loss of traditions/culture	Limit the hiring of non-resident workers to technical personnel. Priorities for employment shall be given to all residents of the concerned Municipality/Province.		
	<b>TOTAL</b>				<b>P 1,255,400.00</b>

Note: Budget for baseline information gathering is not included.

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