SUMMARY OF THE ENVIRONMENTAL IMPACT STATEMNET (EIS) FOR THE PUBLIC

1. Project Description

Project Fact Sheet

<table>
<tr><td>Project Proponent</td><td>Quarry Ventures Philippines Incorporated</td></tr>
<tr><td>Office Address</td><td>117 Shaw Boulevard, Pasig City</td></tr>
<tr><td>Authorized Representative

Contact Person</td><td>Ester D. Rosca
President

Engr. Ser Allain Pleyto
Tenement Manager
Quarry Ventures Phil. Inc,
117 Shaw boulevard, Pasig City
Contact number: +639175907233
E-mail Address: allain_tmcgroup@yahoo.com</td></tr>
<tr><td>Authorized Representative for ECC Application</td><td>Jose Leonilo A. Espineli
President
Philkairos Incorporated
JE Business Center,
Pinesville Road corner Ortigas Avenue Extension,
Taytay, Rizal 1920
Contact Number: (02) 706-4008 / (02) 727-9005
E-mail Address: admin@philkairso.com</td></tr>
<tr><td>Project Name</td><td>Proposed QVPI Cebu Aggregates Project
(Quarry and Crushing Plant) – Parcel 10 of MPSA 111-98-VII (Amended I)</td></tr>
<tr><td>Project Location</td><td>Barangay Cogon, City of Naga and Barangay Camp 8, Municipality of Minglanilla, Province of Cebu</td></tr>
<tr><td>Project Type</td><td>Resource Extractive Industry (Mining Industry)</td></tr>
<tr><td>MPSA Number</td><td>MPSA 111-98-VII (Amended I)</td></tr>
<tr><td>Project Area</td><td>ECC Area / Disturbed Area = 71 hectares
Total Area (Parcel 10): 84 hectares</td></tr>
<tr><td>ECC Application</td><td>New Application (Parcel 10)</td></tr>
<tr><td>Project Components</td><td>Major Components:
<table>
<tr><th>Project Component</th><th>Area / Capacity</th></tr>
<tr><td>ECC / Disturbed Area</td><td>71 hectares</td></tr>
<tr><td>Crusher (Crushing Plant)</td><td>2,000,000 MT/yr</td></tr>
<tr><td>Stockpile Areas</td><td>1 hectare</td></tr>
<tr><td>Haul Roads</td><td>2.2 kms</td></tr>
<tr><td>Buffer Area</td><td>14.32 hectares</td></tr>
</table>
Support Facilities:
<table>
<tr><th>Project Component</th><th>Area / Capacity</th></tr>
<tr><td>Administrative Building</td><td>2,000 sqm</td></tr>
<tr><td>Motor pool Area</td><td>2,000 sqm</td></tr>
<tr><td>Nursery / Seedling Bank</td><td>100 sqm</td></tr>
<tr><td>Power Source</td><td>-</td></tr>
<tr><td>Water Source</td><td>-</td></tr>
<tr><td>Drainage</td><td>-</td></tr>
</table>
Pollution Control Facilities:
<table>
<tr><th>Project Component</th><th>Area / Capacity</th></tr>
<tr><td>Silt Collector Sumps</td><td>3 units</td></tr>
<tr><td>Silt Traps</td><td>8 units</td></tr>
</table></td></tr>
</table>

	Domestic wastewater / Septic Vault	-
	Oil and Water Separator	-
	Air pollution control devices for the back-up generator sets	-
	Solid and Hazardous Wastes Storage Area	-
Mining Method	Surface Mining Method Quarrying	
Extraction Capacity	2,000,000 MT per annum (Basalt and Similar Aggregates Material) 300,000 MT per anum (Cement Raw Material By Product and Overburden 1,000,000 MT per anum (Armour Rock)	

1.1 Project Alternatives

1.1.1 Project Siting

Since mining projects are site specific because mineral extraction can only be undertaken where economic deposits occur, the proponent has not considered any alternative project site. Initial feasibility conducted, drilling/geologic results and environmental considerations reveal that extraction of resource in the area is best suitably done through surface mining method.

1.1.2 Mining Method Selection

Aggregates are extracted through physical removal of the quarry, which involves cutting and blasting. Considering the target minerals, these would be the best methods available for extraction. These methods, however, would induce dust generation so proper mitigating measures would be implemented all throughout the operation. Safety of the community and employees would also be considered due to the nature of the mining method. Proper measures, like wearing of PPE's and informing the community of blast schedules, will be observed.

1.1.3 Resources Mineralization

Resource Estimation

The estimate for the resources embodied in the Cansi Volcanics within Parcel X of MPSA 111 was derived with the aid of Geovia-Surpac software.

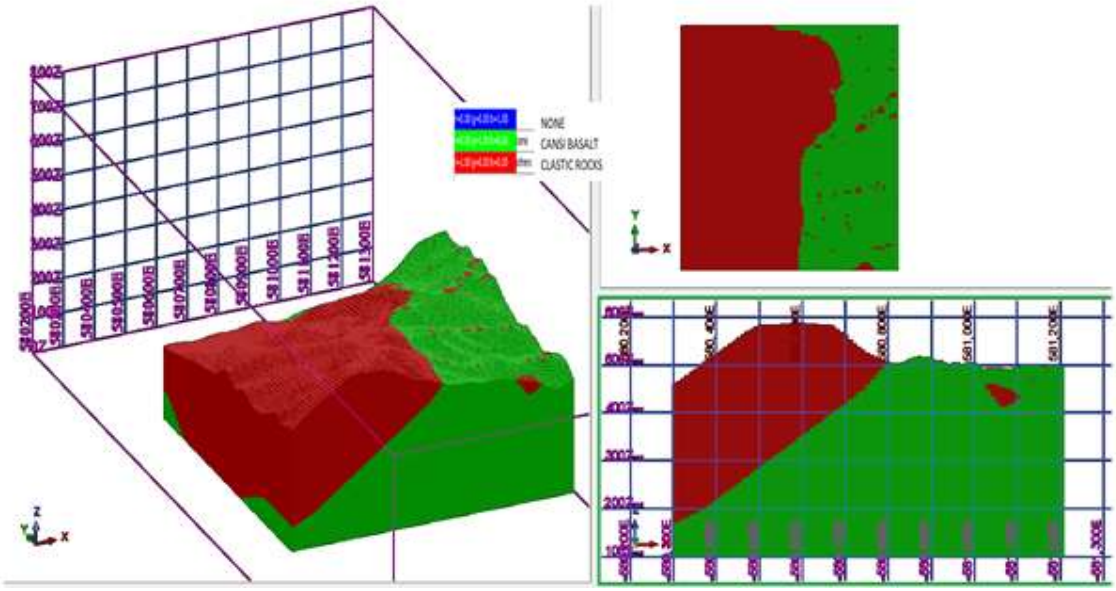


Figure 1-4: Geologic block model (left) covering the area designated as Parcel X of MPSA 111, plan view (top right) and section of the southern (lower) end of the block (bottom right) from which the resource estimate model was constructed. Overburden and clastic rocks together constitute a separate domain differentiating them from the domain of Cansi Volcanics.

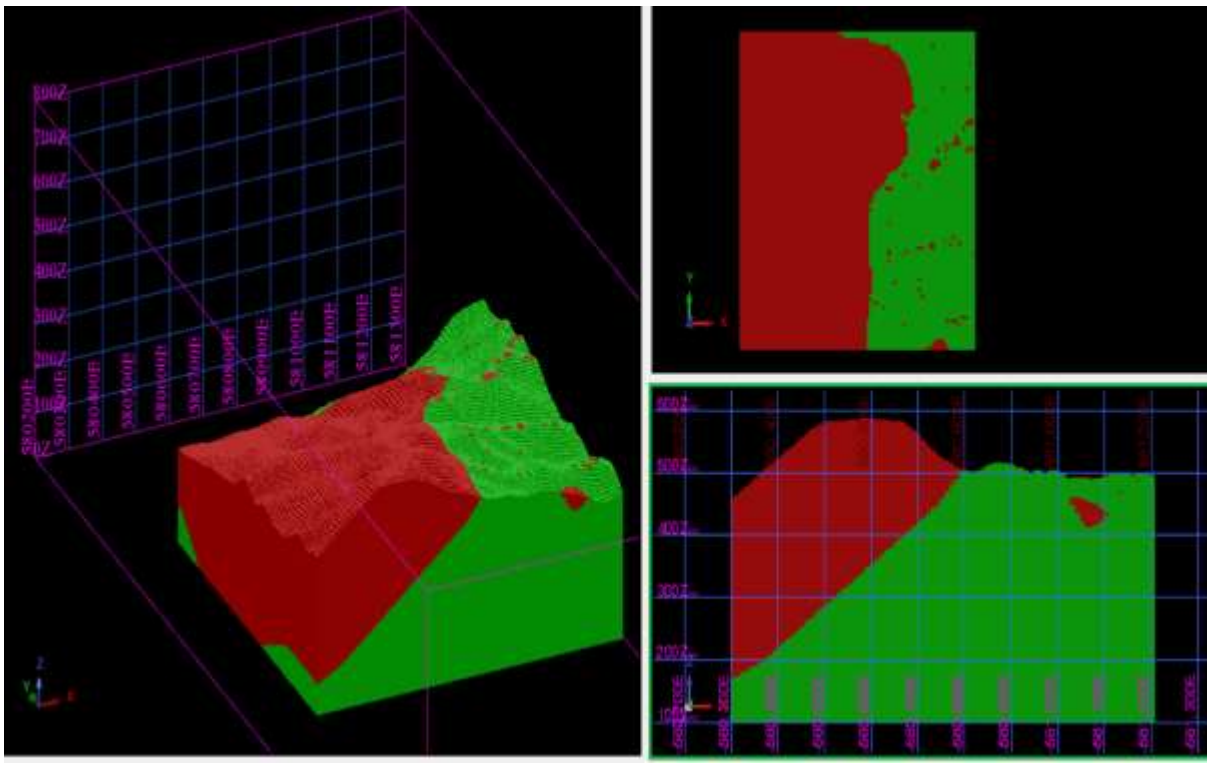


Figure 1-4: (Left) Geologic resource block model showing indicated (GREEN) and inferred (RED) resources for Cansi Volcanics within MPSA 111 Parcel X; (Top right) Plan view showing the area occupied by Indicated Resource of the Cansi Volcanics; (Bottom right) South section view showing inferred resource topped by a capping of Pandan Formation.

The volume of Cansi Volcanics for Indicated Resource obtained with the aid of Geovia-Surpac software is 82,609,195 cubic meters, whereas that for Inferred Resource is 125,545,025 cubic meters. On the other hand, the volume for waste is 780,828 cubic meters in the Indicated category, and 6,445 cubic meters in the Inferred category. Applying a compensation factor of 5% to account for discontinuities such as joints and fractures, the volume of Indicated and Inferred Resources for the Cansi Volcanics is pared down to 78,479,000 cubic meters and 119,268,000 cubic meters, respectively. Using the average specific gravity of 2.8 as determined from six samples submitted to E.B. Testing, Inc., the tonnage of indicated resource and inferred resource for the basaltic aggregates deposit in Parcel X of MPSA 111 is 218 mMT and 333 mMT, respectively. **Table 1-2** summarizes the results of the estimates, rounded to appropriate significant figures.

Table 1-2: Estimates for the volume and tonnage of Indicated and Inferred resources for Cansi Basalt and the volume of waste (overburden and clastic rocks) within Parcel X of MPSA 111 of QVPI. Tonnage obtained based on specific gravity equal to 2.8.

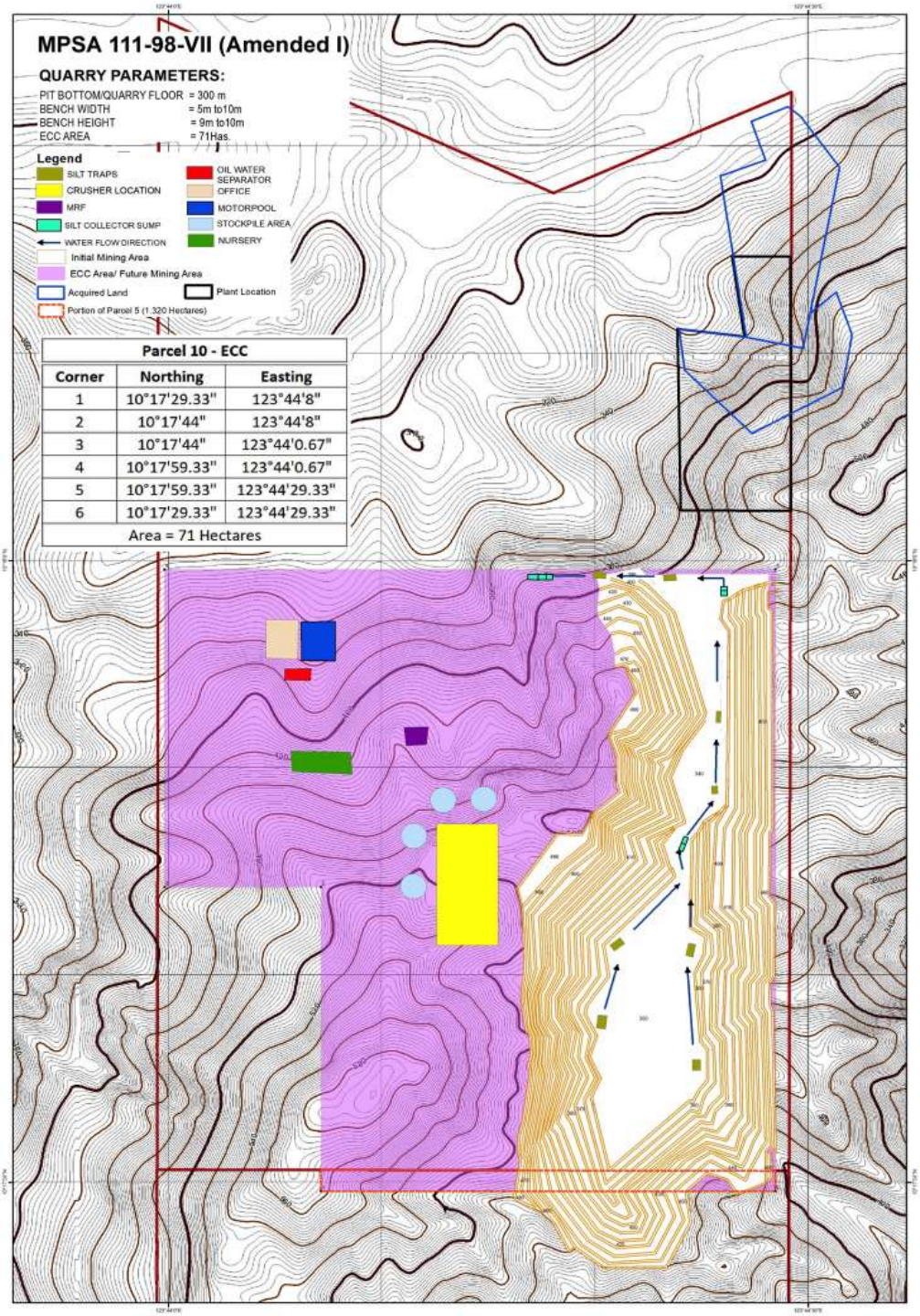
Lithologic Domain	Indicated Resource	Inferred Resource
Cansi Volcanics Volume	78 million cubic meters	119 million cubic meters
Cansi Volcanic Tonnage	218 million metric tons	333 million metric tons
Clastic Rocks/ Overburden	780,000 cubic meters	6,445 cubic meters

Resource estimation with the aid of Geovia-Surpac software from a base level of 200 masl reveal that there is a sizeable deposit of basaltic volcanic rock in Parcel X of MPSA 111. The volume of Indicated Resources of the Cansi Basalt in Parcel X amounts to 78.4 million cubic meters, while the volume for Inferred Resource estimated from 200 masl down to 100 masl and below the clastic rocks, amounts to 119.2 million cubic meters.

1.2 Project Components

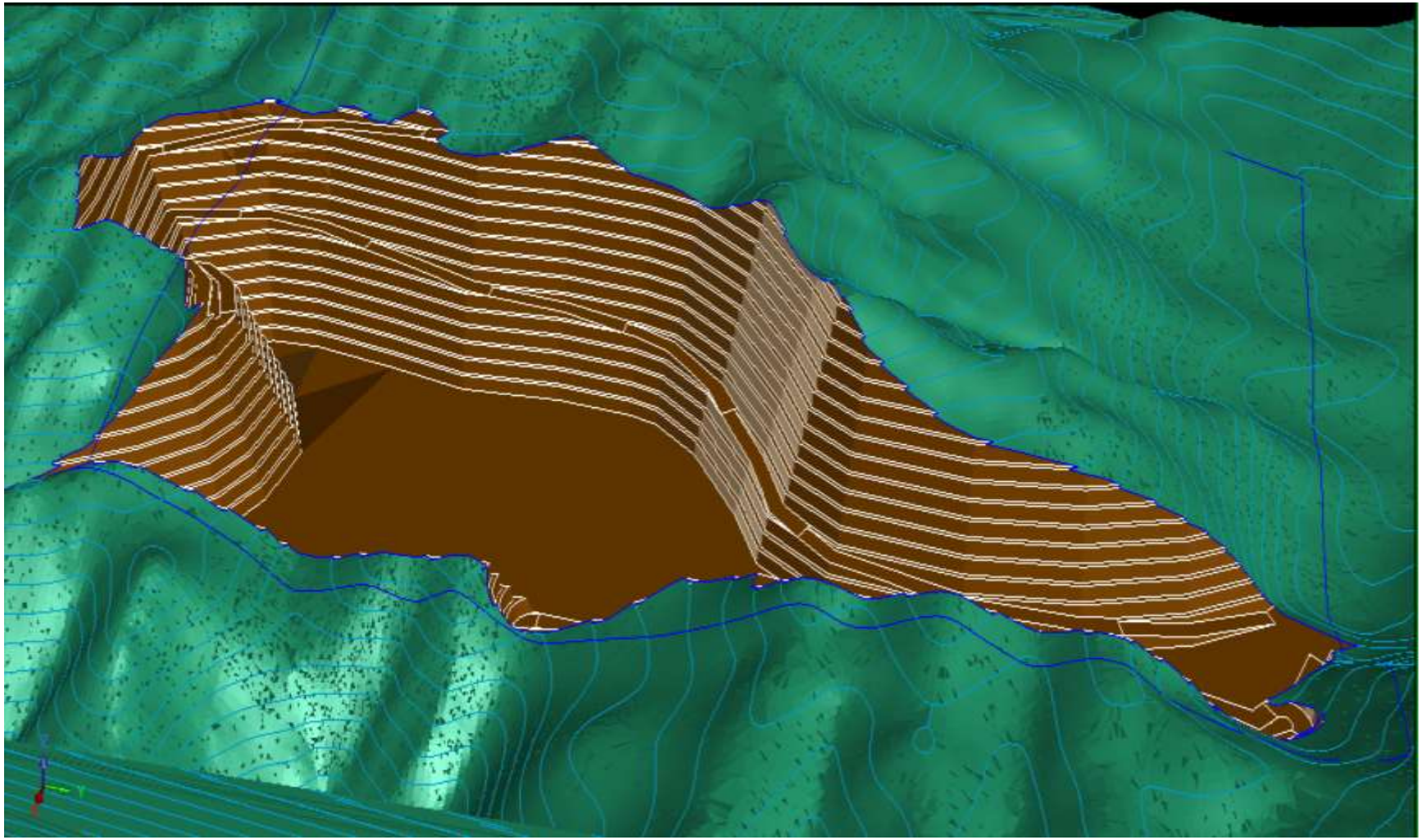
The project components will consist mainly of the quarry area, crusher (crushing plant), stockpile area, haul roads and various support infrastructures/facilities such as silt collector sump, silt traps, materials recovery facility (MRF), oil and water separator, nursery, motor pool areas for heavy equipment and service vehicle preventive maintenance service and administrative office infrastructure.

The site development plan of the proposed quarry project is shown in **Figure 1-5a**. On the other hand, the final design of the quarry area is shown in **Figure 1-5b**. The details of the project's main components, support facilities and pollution control facilities are presented in **Table 1-3**, **Table 1-4** and **Table 1-5**, respectively.



Map Source: QVPI

PHILKAIROS INCORPORATED	TITLE: **Site Development Plan of Parcel 10**	FIGURE NO.
	Proposed QVPI Cebu Aggregates Project (Quarry and Crushing Plant)	**1-5a**



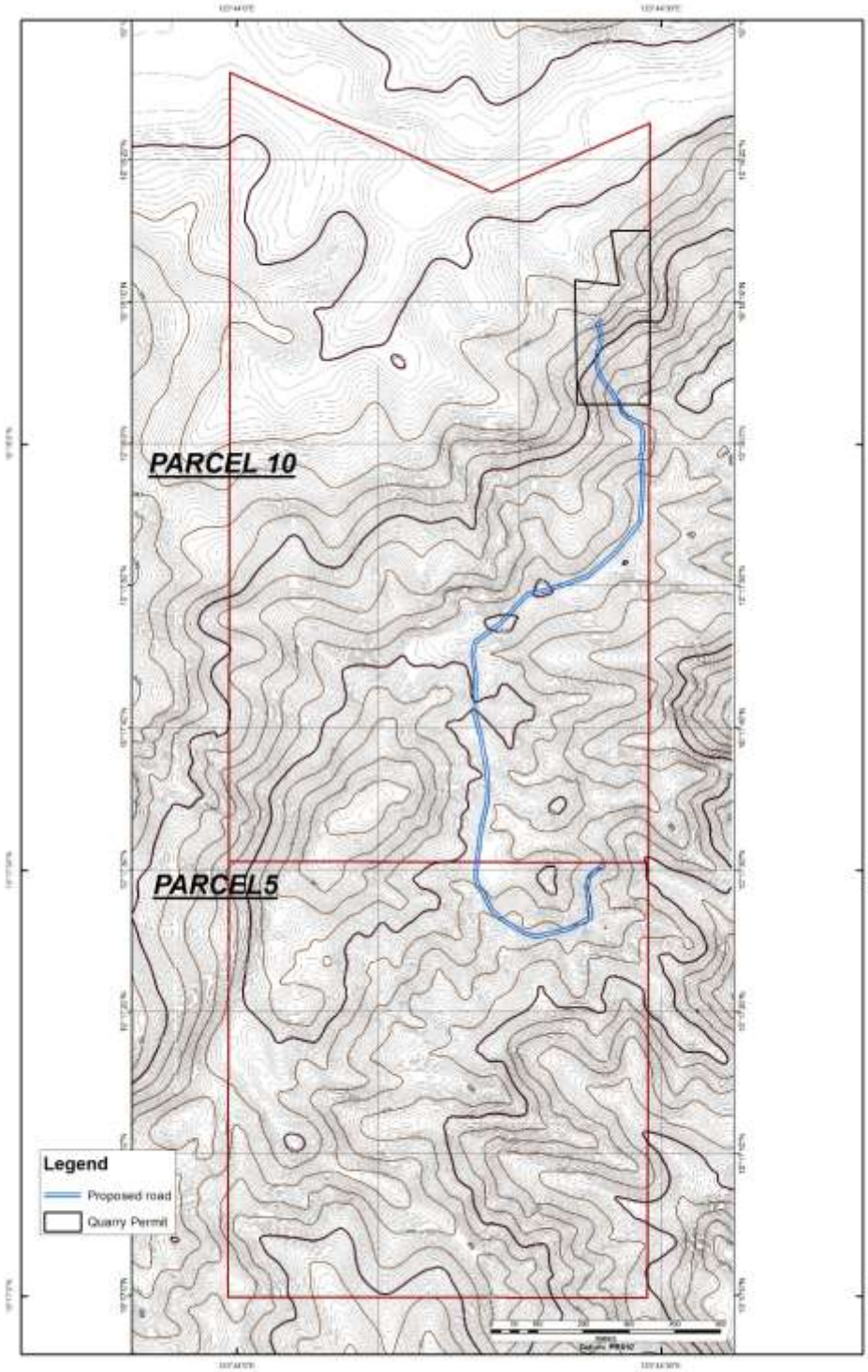
Map Source: QVPI

PHILKAIROS INCORPORATED	Final Design of the Quarry Area for Parcel 10 (portion of the quarry area extends to Parcel 5)	FIGURE NO.
	Proposed QVPI Cebu Aggregates Project (Quarry and Crushing Plant)	**1-5b**

Table 1-3: Major Components of the Project

Project Component	Area / Capacity	Location	Component Description
ECC / Disturbed Area	71 hectares	Within Parcel 10 and portion of Parcel 5 (as shown in **Figure 1-5a**)	Parcel 10 has an allowable quarry area of 84 hectares. However, the quarry activities shall be extended to Parcel 5 as delineated in **Figure 1-5a** with a total area of 76 hectares. The technical description / boundaries of the 71-hectare disturbed area are also shown in **Figure 1-5a**. The mine pit shall have the following parameters: • Pit Bottom / Quarry Floor = 300 meters • Bench Width = 5 to 10 meters • Bench Height = 9 to 10 meters • Bench Slope = 70 degrees Quarry operations shall have a maximum annual extraction rate of 2 million MT.
Crusher (Crushing Plant)	2,000,000 MT/yr	Within Parcel 10 (as shown in **Figure 1-5a**)	The blasted materials will undergo crushing, screening and classifying processes with the introduction of water spray to eliminate dust, silt and other materials that are not part of the final product. The run-of-mine-ore will undergo three stages: (1) crushing, (2) screening and (3) classifying. The crusher (crushing plant) shall a maximum annual production rate of 2 million MT. As shown in **Figure 1-5a**, the crushing plant is to be located within Parcel 10.
Stockpile Areas	1 hectare	Within Parcel 10 (as shown in **Figure 1-5a**)	Stockpile area will be designated for the overburden materials as a result of the quarrying activity. All good materials will be hauled from the quarry site to the stockpile area. Moreover, all quarry wastes specifically topsoil and boulders will be stockpiled in the waste dump area and will be utilized as a backfilling material during progressive rehabilitation.

Project Component	Area / Capacity	Location	Component Description
			Stockpile slope will be kept at low angle and height to minimize slumping. The proposed height of the stockpile will depend on the angle-of-repose of the material. This is to ensure that the maximum volume of materials will be stockpiled without sacrificing safety.
Haul Roads	2.2 kms	Within the Parcel 10	The haul roads shall connect the QP (north of Parcel 10) to Parcel 5 at 340masl. The haul roads shall have a width of 12 meters and 10-meter turning radius (minimum). (As shown in **Figure 1-6**) The haul roads will be constructed following the topographic surface contour and shall have a maximum gradient of 10% to ensure safety and efficiency. Haul road and access road shall be ballasted with waste rock extracted from the quarry area to provide stability.



Map Source: QVPI

PHILKAIROS INCORPORATED	TITLE: **2.2-kilometer access/haul roads connecting the QP to Parcel 5, traversing Parcel 10.**	FIGURE NO.
	Proposed QVPI Cebu Aggregates Project (Quarry and Crushing Plant)	**1-6**

Table 1-4: Support Facilities of the Project

Project Component	Area / Capacity	Location	Component Description
Administrative Building	2,000 sqm	Within the Parcel 10 (as shown in **Figure 1-5a**)	The admin office will accommodate the field personnel of the project.
Motor pool Area	2,000 sqm	Within the Parcel 10 (as shown in **Figure 1-5a**)	Designated motor pool area and maintenance shops for equipment and service vehicles will be allotted.
Nursery / Seedling Bank	100 sqm	Within the Parcel 10 (as shown in **Figure 1-5a**)	Designated nursery area for plant/tree species to be used during progressive rehabilitation
Power Source	-	Within the admin complex area	Power to the site will be supplied by the Visayan Electric Company (VECO). Generators will be installed on standby, in case of power failures, that could generate 120 KW of power.
Water Source	-	Within the admin complex area	Domestic water requirement for mine offices and other facilities will be sourced from deep well / groundwater available on site. Surface water from nearby river/s will also be used to augment the water supply for the project.
Drainage	-	Within the Parcel 10	Quarry drainage to be constructed will have a sufficient depth to handle volume of storm runoff and will be laid along the bench toe. Berms will be provided on the unprotected crest side to ensure safety.
Others	-	Within the Parcel 10	The project will also include auxiliary facilities such as a sewerage system for admin office, water storage facility for domestic supply, administrative and general services facilities.

Table 1-5: Pollution Control Facilities / Devices

Project Component	Area / Capacity	Location	Component Description
Silt Collector Sumps	3 units	Within the mine pit (as shown in **Figure 1-5a**)	Settling ponds (silt collector sumps) will be established at strategic locations around the quarry area. The technical details of the siltation pond / silt trap is presented in **Figures 1-7a** and **1-7b**. Sedimentation/settling ponds (silt collector sumps) shall be constructed to trap the sediments coming from the project operation. This facility shall be made of compacted
Silt Traps	8 units		

Project Component	Area / Capacity	Location	Component Description
			materials and shall be strategically located adjacent to the quarry and stockpile areas. The purpose of the sediment/settling ponds is to block the water runoff with silt and impound/trap the water to allow the silt to settle. Settling ponds will be constructed in series. Sediments shall be impounded from the first to the third pond in succession. While, the second pond is utilized, the first pond shall be drained and allowed to dry and desilted. Recovered silt materials will be used to backfill mined out areas. The third pond shall act a buffer for the first two ponds and shall be the source of water for the road sprinkling. Silt traps will also be constructed along the main drainage canals to initially trap sediments carried by heavy rain before going to main settling ponds.
Domestic wastewater	-	Within the admin complex area	Septic vault will be provided for the admin building to accommodate the generated domestic wastewater.
Oil and Water Separator	-	Within the motor pool area (as shown in **Figure 1-5a**)	Oil and water separator will be established to treat wastewater generated at the motor pool area.
Air pollution control devices for the back-up generator sets	-	Connected to the generator sets	Generator sets will be installed with built-in air pollution mitigating device. The generator sets will be regularly maintained to ensure efficiency of the pollution device.
Solid and Hazardous Wastes	-	Within the admin complex	The project shall have its own MRF for solid wastes. Waste bins, for proper segregation of solids, shall be placed in conspicuous areas within the admin complex area. A separate storage area for hazardous wastes shall be made available on site. The haulage, treatment and disposal of hazardous wastes shall be done by EMB

Project Component	Area / Capacity	Location	Component Description
			accredited waste haulers and treaters.

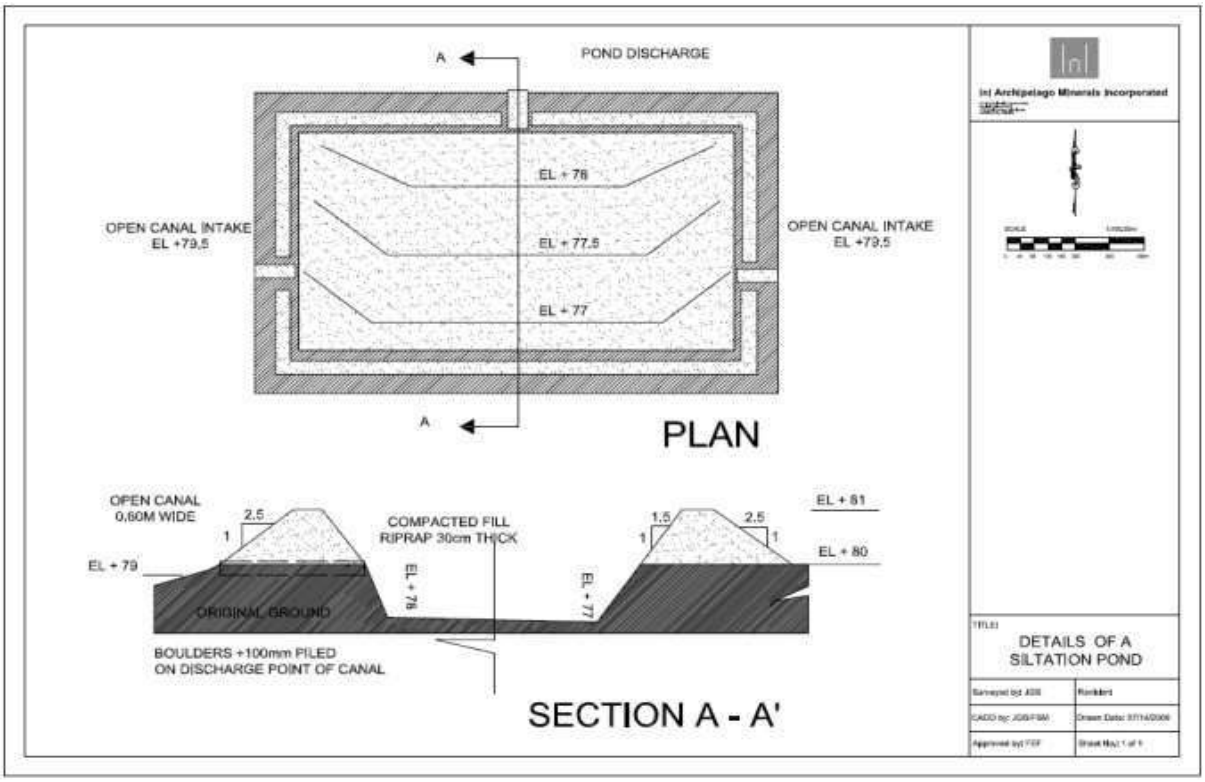


Figure 1-7a: Settling Pond / Silt Trap Design

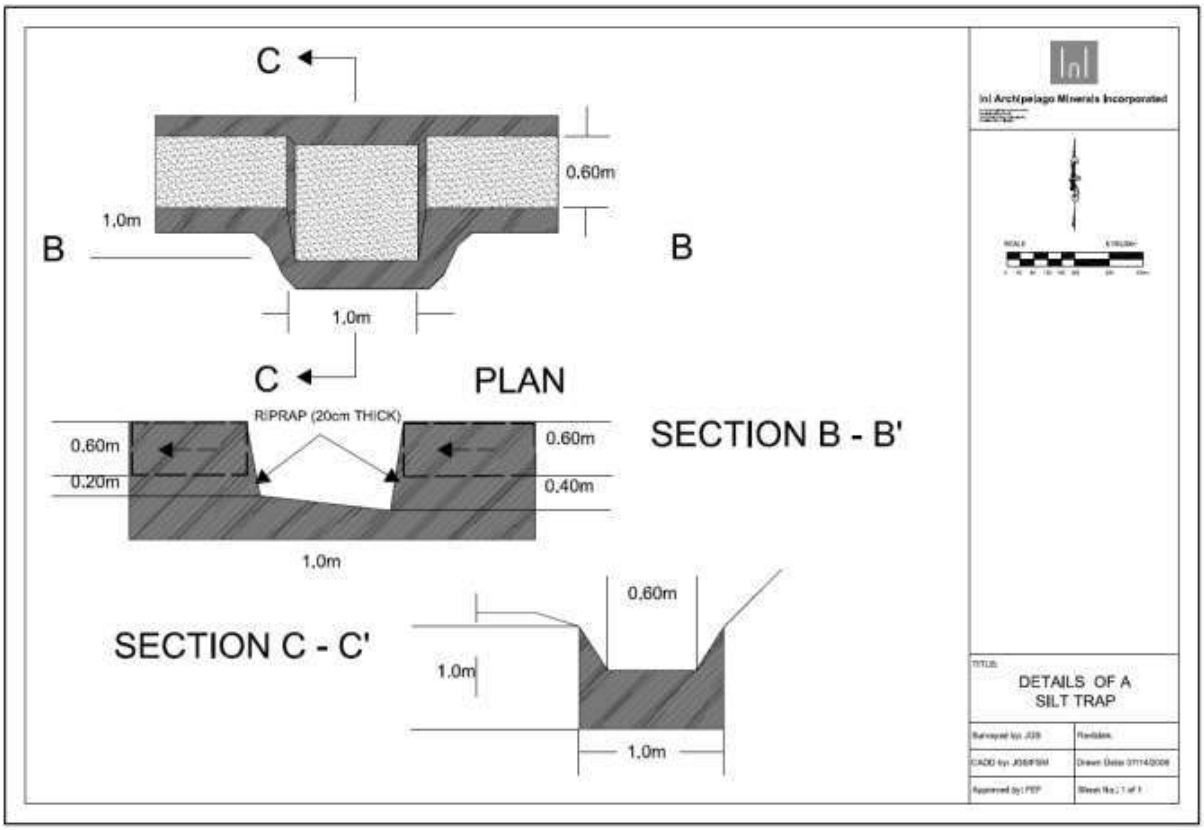


Figure 1-7b: Settling Pond / Silt Trap Design

1.3 Process / Technology

Quarry/Mining Methodology

Surface Mining Method, particularly, quarrying will be employed for the whole project operation. The quarry operation will be divided into two stages; the quarry development and the production stage.

Development phase is the stage in quarry where preparation for full blasts operation will be carried out. It will involve removal and grubbing of vegetative covers, stripping of overburden and establishment of production benches, drainage canals, settling ponds and access roads to the deposit.

The extraction or production stage is the actual removal of the deposit from the developed (cleared) benches. The major activities in this stage are drilling for quality control and simply ripping and dozing on soft and medium ground while drilling, cutting, and blasting for hard rock area followed by loading and hauling of quarry materials.

Loosened/Blasted basalt materials from the bench will be loaded by either a wheel loader or backhoe (excavator) shovel into a 25-ton truck and will be transported to the crusher or nearby area. By the time the loosened materials are fully hauled out, a new loading area will be available. The cycle of drilling for quality control, blasting, excavation, loading and hauling continues until all programmed benches have been subjected for production and resource exhaustion.

Blasting Operations

For soft ores, rippers and the excavator will be used to extract and load the limestone to the dump trucks. For hard ores, blasting will be employed. Only government authorized blasting contractors will be engaged in the blasting. Controlled blasting using delays will be used to minimize ground vibrations, fly rocks and misfires. Desired boulder size is less than 1m. When blasting is needed, the quarry will be prepared for a conventional drill and blast operation with a bench height of 10 meters. Blasting and explosive materials will be provided by the blasting contractor.

Crushing of Aggregates

Aggregates Crushing Plant (Wet Process)

Aggregates manufacturing is accomplished by a series of rock crushing for size reduction and screening to separate aggregate sizes. This plant is on dry process from feed hopper down to the pre-screening screen while the sizing screen is equipped with wet kit to wash the aggregates and sand classifier where dewatering takes place before the fines (sand) is stockpiled.

The water balance diagrams of the crushing plant operation at 250 tph and 350 tph are shown below.

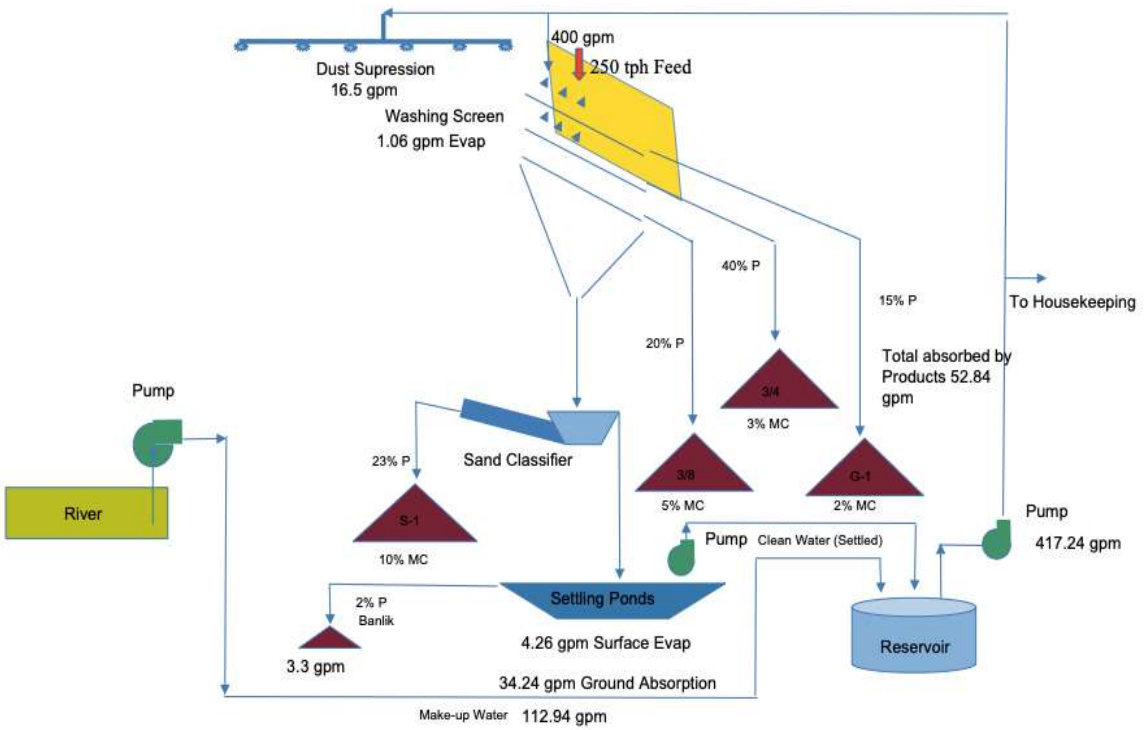


Figure 1-7a: Water Balance Diagram of the Crushing Plant operating at 250 tph.

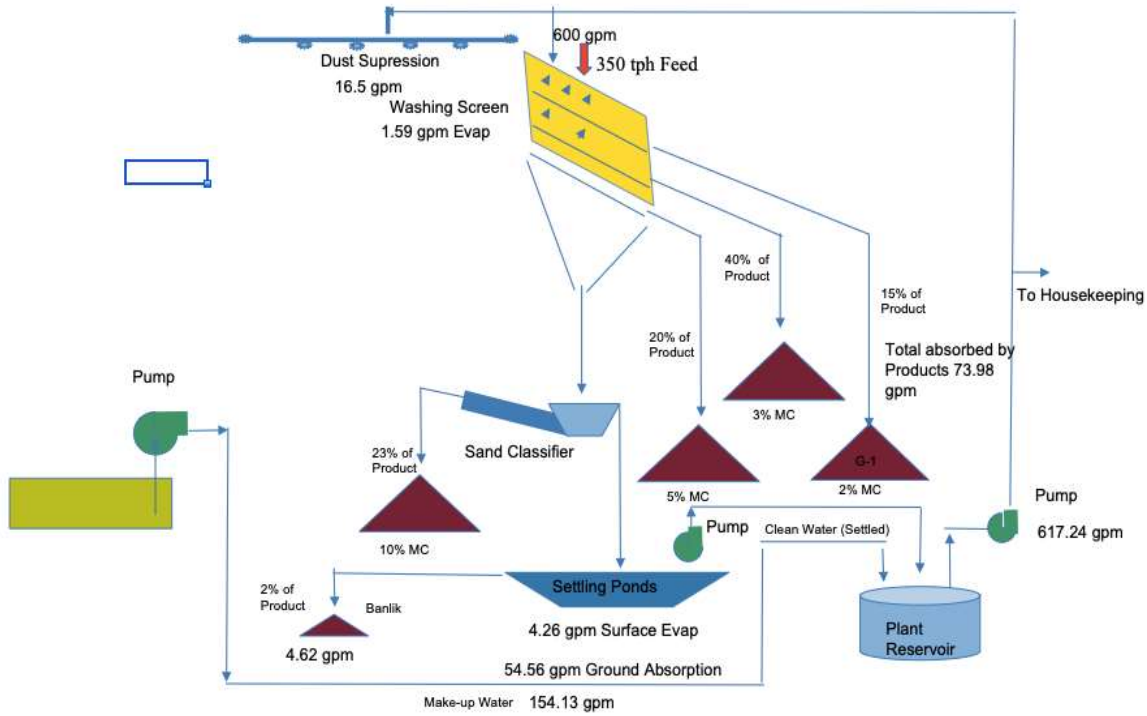


Figure 1-7b: Water Balance Diagram of the Crushing Plant operating at 350 tph.

Feed (Raw Material)

In this case the feed material which comes from mountain quarry is delivered to the plant hopper by dump trucks. The feed material is sorted at source so as not to contain stones or boulders greater than the maximum feed size acceptable to the primary crusher.

Primary Crushing Stage

Under the raw material hopper is a vibrating grizzly feeder capable of moving the dumped feed to the primary crusher which in this case is a single toggle jaw crusher model that can crush hard rock as big as 800 mm. The vibrating grizzly feeder can scalp fine portion of the feed that is less than the closed side setting size of the jaw crusher to by-pass it then goes into a stockpile or joins the crushed materials on a conveyor belt after the primary crusher. The primary jaw crusher can reduce the size of the feed at 1:6 ratio and it is a very good practice to put the crushed materials in a surge pile where the next crushing stage draws its feed.
Without the surge pile, the primary and secondary stages are in one series of process while with surge pile, the primary and secondary stages can operate and be maintained at their own times.

Secondary Crushing and Screening Stage

A draw out tunnel under the surge pile is equipped with pan feeder/s that vibrates and delivers the required amount of feed materials to the secondary crusher which in this case is a cone capable of handling the materials size from the surge pile and crushing it by compression at 1:6 reduction ratio.

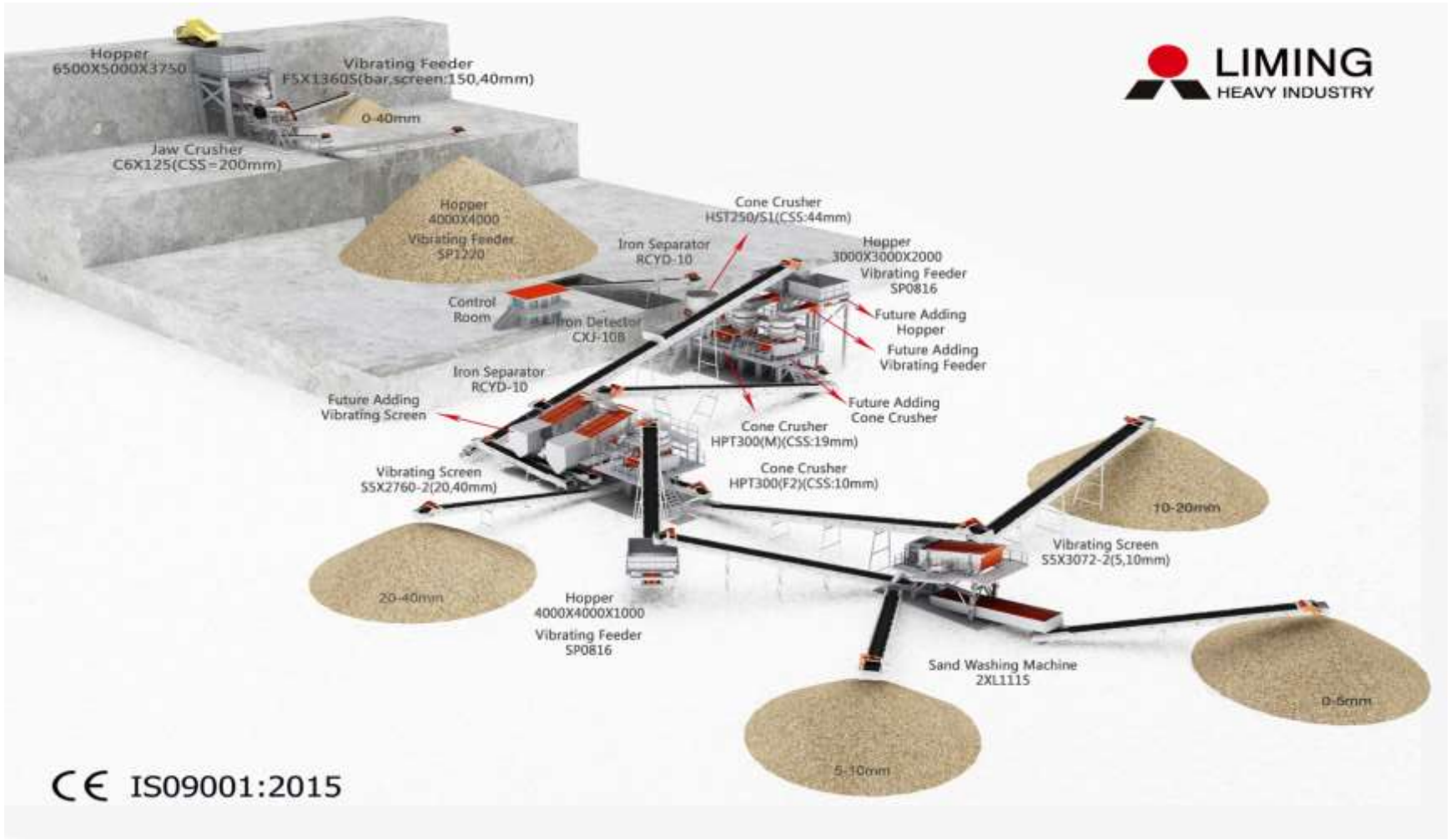
Crushed materials from the secondary cone crusher is delivered by a main (wide) belt conveyor to be fed to a pre-screening unit which separates the oversize (material retained at the topmost deck), mid-size materials and/or undersize (passing the square mesh size at the bottom deck). The oversize is diverted to the next (tertiary) crusher for further size reduction. The midsize materials usually 20-40 mm or G-1 aggregates is stockpiled by a belt conveyor or returned to the circuit for further crushing. Materials passing the bottom mesh usually 0-20 mm goes to the sizing screen for separation into different sizes of product aggregates. Water spray nozzles are directed against the flow of screened materials to wash the dust or soil from the coarse aggregates. Sand which passes the bottom deck usually 5mm together with the process (washing) water is collected by chute and pipe works and directed into a sand washing machine which is either a sand screw, a bucket wheel or a hydro-cyclone with a dewatering screen. Dewatered sand is stockpiled using a belt conveyor while the process water goes to settling pond/s for re-use.

A quaternary crusher may also be used (sometimes this is on standby within the circuit) to further reduce the size of what would have been stockpiled already as 0-40 mm (G-1) or 5-10 mm (3/8) to produce more sand. The crusher may be a tightly set cone crusher or a vertical shaft impactor (VSI) depending upon the toughness and abrasiveness of material.
This plant will be equipped with dust suppression system at the delivery and discharge points to mitigate fugitive dust beyond the crushing plant area.

Products

This plant normally can produce four ASTM standard aggregates for construction industry namely fine aggregates 0-5 mm or S-1, coarse aggregates 5-10mm or (3/8), 10-20 mm (3/4) and 20-40 mm or (G-1). Road base (base coarse or sub-base coarse) can also be produced at the primary stage.

Figure 1-8 shows the overall process of the crushing plant.



Imge Source: QVPI

PHILKAIROS INCORPORATED	Final Design of the Quarry Area for Parcel 10 (portion of the quarry area extends to Parcel 5)	FIGURE NO.
	Proposed QVPI Cebu Aggregates Project (Quarry and Crushing Plant)	**1-8**

1.4 Project Size

1.4.1 Resource Availability

Resource estimation with the aid of Geovia-Surpac software from a base level of 200 masl reveal that there is a sizeable deposit of basaltic volcanic rock in Parcel X of MPSA 111. The volume of Indicated Resources of the Cansi Basalt in Parcel X amounts to 78.4 million cubic meters (218 million MT), while the volume for Inferred Resource estimated from 200 masl down to 100 masl and below the clastic rocks, amounts to 119.2 million cubic meters (333 million MT).

	(In Million cubic meters)	(In Million MT)
Indicated Resources	78.4	218
Inferred Resources	119.2	333
Indicated + Inferred	197.6	551

1.4.2 Production Capacity and Area

The quarry operations will be situated in Barangay Cogon, Naga City and Barangay Camp 8, Minglanilla in the Province of Cebu. The project activities, however, would not be covering the whole of the Parcel, to allow for buffer areas and to separate the areas that does not have any mineral deposit. The disturbed area would encompass the whole quarry area (covering a protion of the adjacent Parcel 5) with the project facilities, including the Pollution Control Facilities. Parcel 10 has an allowable quarry area of 84 hectares. The quarry activities shall be extended to Parcel 5 as delineated in **Figure 1-5**. The disturbed area of the project is 71 hectares, which includes the 1.320-hectare extended quarry area from Parcel 5. The buffer area of the project is 14.32 hectares, which is subject to further exploration.

The proposed project will have a maximum annual extraction rate of 2 million MT, which will be steadily ramped-up from an initial 500,000 MT per annum. Similarly, the crusher (crushing plant) will have a maximum annual production capacity of 2 million MT of basalt. Other materilas such as cement raw material (maximum extractiopn rate of 300,000 MTPY) and armour rock (maximum extraction rate of 1,000,000 MTPY) shall be likewsie produced. The production schedule for the proposed project is presented in **Table 1-6**. These are projected production schedules and actual volume production shall depend on market demand for the year.

Table 1-6: Production Schedule

Year	Production (MT) Basalt and Similar Aggregates Material	Production (MT) Cement Raw Material By Product and Overburden	Production (MT) Armour Rock
1	500,000 (2021)	150,000	500,000
2	750,000 (2022)	150,000	750,000
3	750,000 (2023)	225,000	750,000
4	1,000,000	200,000	1,000,000
5	1,000,000	200,000	1,000,000
6	1,000,000	200,000	750,000
7	1,500,000	225,000	500,000
8	1,500,000	225,000	500,000
9	1,500,000	200,000	500,000
10	1,500,000	225,000	750,000
11	1,500,000	200,000	1,000,000
12	1,500,000	200,000	750,000
13	1,500,000	225,000	500,000
14	1,500,000	200,000	400,000
15	1,500,000	200,000	300,000
16	1,500,000	225,000	250,000
17	1,500,000	225,000	250,000
18	1,500,000	225,000	250,000
19	1,500,000	225,000	250,000
20	1,750,000	250,000	200,000

Year	Production (MT) Basalt and Similar Aggregates Material	Production (MT) Cement Raw Material By Product and Overburden	Production (MT) Armour Rock
21	1,750,000	250,000	200,000
22	1,750,000	225,000	200,000
23	2,000,000	300,000	200,000
24	2,000,000	300,000	200,000
25	2,000,000	300,000	200,000
26	2,000,000	275,000	200,000
27	2,000,000	275,000	200,000
28	2,000,000	250,000	200,000

1.4.3 Mine Life

Based on the calculation of the proposed extraction capacity, and the mineral reserve capacity, the mine life for the project area is estimated to last for 278 years for the aggregates (as shown in **Table 1-7**). However, the proponent only plans to operate on the project site up to the validity of the MPSA, subject to renewal, if necessary.

Table 1-7: Mine Life

Parcel	Proposed Extraction Capacity	Mineral Reserve Capacity (Indicated + Inferred)	Estimated Mine Life
Parcel 10	2,000,000 MT / yr	551,000,000 MT	275.5 years

2. Proposed Location with Vicinity Map of the Project Facilities/Components

The proposed quarry project of Quarry Venture Philippines, Inc. (QVPI) is located in Barangay Cogon, Naga City and Barangay Camp 8, Minglanilla in the Province of Cebu with a total land area of 84 hectares. The technical description of Parcel 10 is shown in **Table 1-1**.

Table 1-1: Geographical Coordinates of Parcel 10

CORNER	LATITUDE	LONGITUDE
1	10° 17’ 30’’	123° 44’ 00’’
2	10° 18’ 00’’	123° 44’ 00’’
3	10° 18’ 00’’	123° 44’ 30’’
4	10° 17’ 30’’	123° 44’ 30’’

Project Accessibility

In terms of accessibility, the City of Naga is approximately 25 kilometer south of Cebu City, the capital of the province of Cebu. It is situated along the eastern coast on the southern half of the island of Cebu. The town at the northeastern part of Naga is Minglanilla while Toledo City is in the northwest. Parcel 10 can be accessed by a 4x4 vehicle from Cebu City to Naga (45 minutes drive) thru the South Reclamation Project Highway, then to Barangay Lanas, Naga via the Cebu Trans-Central Highway (15 minutes), and then by a barangay road to the western edge of the Parcel V-X block (40 minutes). Foot trails and dirt bike pathways crisscross the quarry area.

Project Site Vicinity

The area adjoining the northern side of Parcel 10 is an EPA block owned by QVPI (**Figure 1-2b**). As shown in **Figure 1-2c**, Parcel 10 is adjoined by Parcel 5 of MPSA 111-98-VII (Amended I) and MPSA 194 (JLR Construction and Aggregates Corp.) to the south; EPA area (QVPI) to the north; MPSA 307 (Atlas Consolidated Mining and Development and others) to the west; and Application for MPSA by Atlas Consolidated Mining and Development to the east.

The area around Parcel 10 of MPSA 111-98-VII (Amended I) can be divided into three main terrain types: a) the N-S ridges associated with the Mt. Lanas – Mt. Cabaluan Range Highlands (**Photo 1-1**); b) the hilly rolling terrain and undulating slopes (**Photo 1-2**); and c) the valley lowlands.

Photo 1-1: View looking south from Mt. Cabaluan showing the ridge-forming terrain of Mt. Lanas Range (background) in Parcel X of MPSA 111

The ridges associated with the Mt. Lanas Range (543 masl elevation) extend northward, connecting with Mt. Cabaluan (584 masl), and partly crossing the western edge of Parcel 10 (along the Brgy. Lanas Road). The Mt. Cabaluan ridge occupies the southern half of Parcel 10.

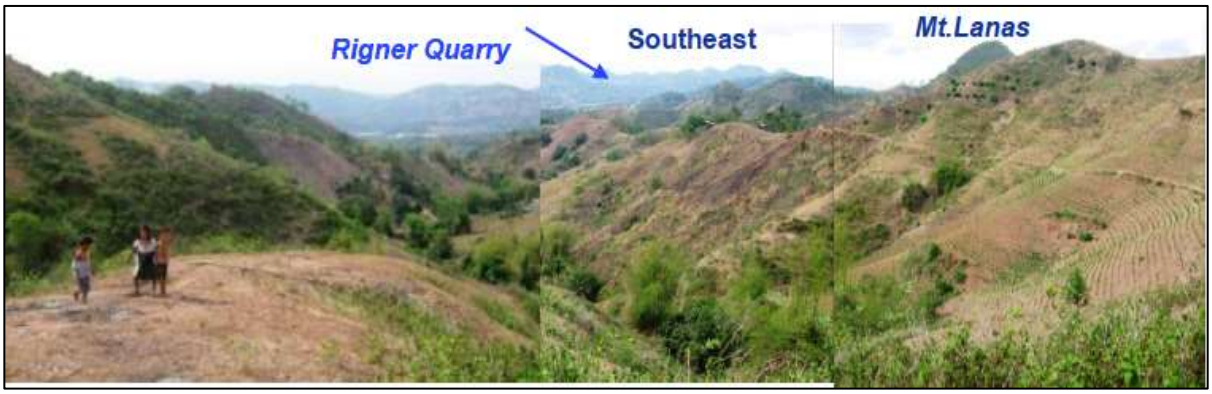


Photo 1-2: View looking southeast from the western edge of Parcel X showing the hilly slopes and ridge-forming terrain characterizing the surveyed area. Note almost denuded slopes and ridges with only cogon grass and secondary trees vegetating the area.

The hilly and rolling slopes (**Photo 1-2**) constitute several East-West trending ridges and their associated spurs-hills and v-shaped creek valleys flowing eastward to Abuno River. The hills have rolling topography with small plateau-like crests. These areas fall within the elevation range from 220 to 500 masl.

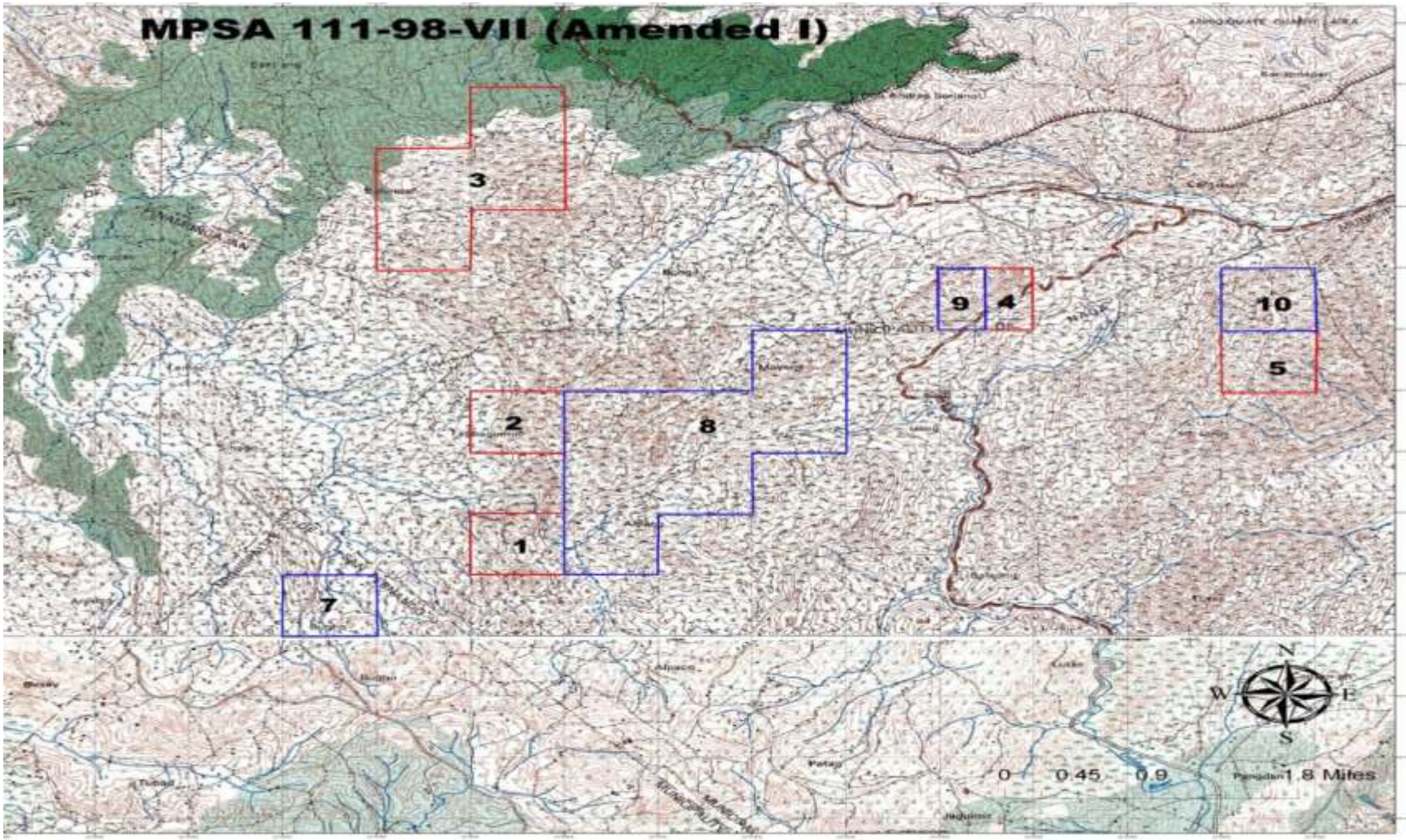
The area, aside from the ridge terrain shown here and by the hilly to rolling terrain at the eastern flank, is also characterized in the eastern section by valley lowlands and undulating hills.

Photo 1-3: View looking northwest from Brgy. Lanas school showing the ridge-forming terrain of Mt.Cabaluan within the southeastern section of Parcel X area. Note several steep and V-shaped creek valleys draining the ridge area.

The hilly terrain and rolling slopes constitute several East-West trending ridges and their associated spurs-hills and creek drainages. The hills have rolling topography with small plateau-like crests (**Photo 1-3**). These areas fall within the elevation range from 230 masl to 500 masl. Aside from having the ridge terrain and the hilly to rolling slopes at the eastern flank, Parcel X is also characterized by V-shaped valley lowlands (**Photo 1-3**) with semi-rolling terrain (190- 220 masl elevation).

Photo 1-4: View looking east showing the hilly and rolling terrain at the eastern flank of the QVPI EPA area. Note the denuded land that has been ploughed as part of a corn farmland.

PHILKAIROS INCORPORATED	Aerial photos (drone shots) of the project site	PHOTO NO.
	Proposed QVPI Cebu Aggregates Project (Quarry and Crushing Plant)	**1-5**

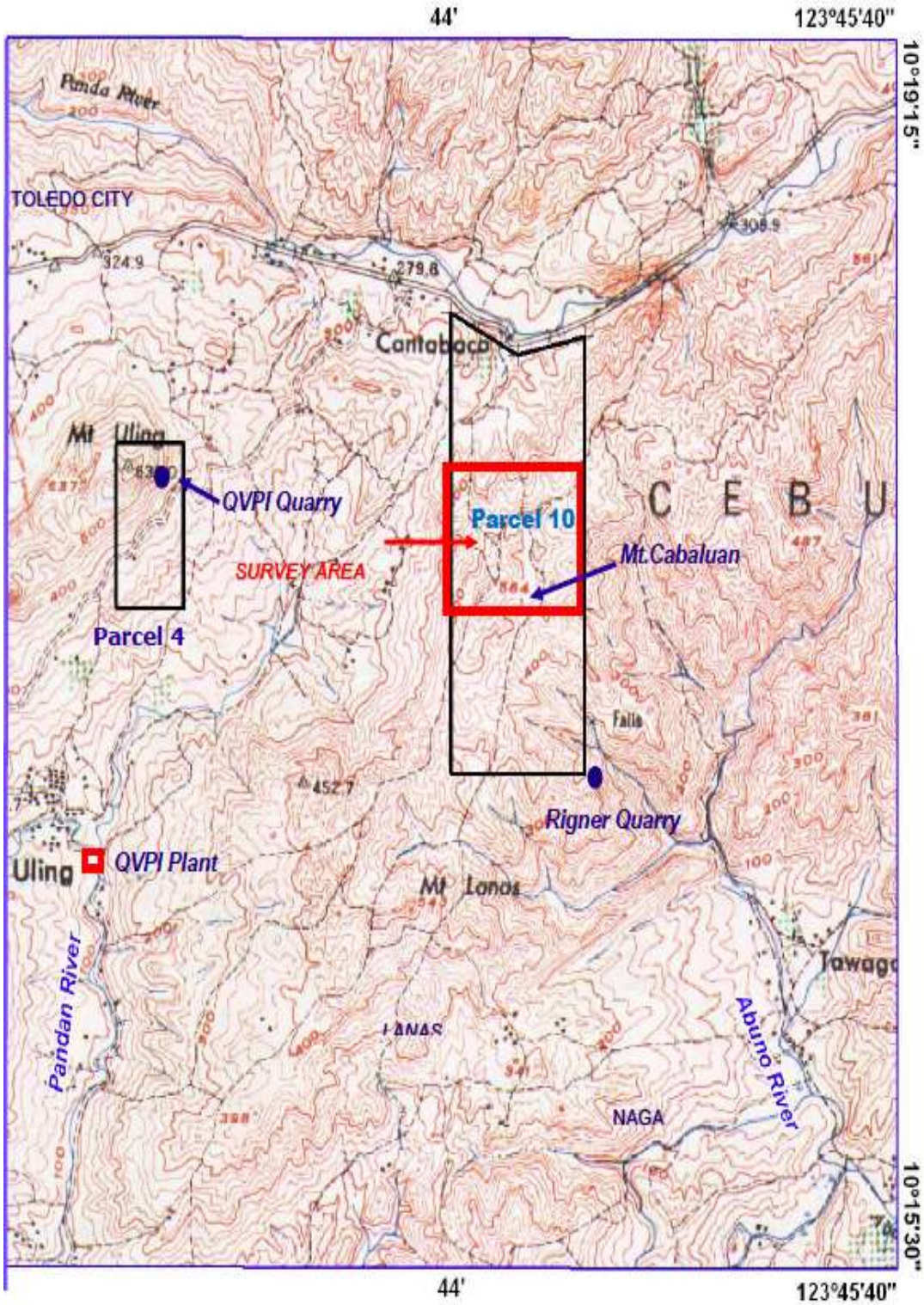


Map Source: QVPI, FER (2018)

PHILKAIROS INCORPORATED	Topographic map showing location of Parcel X and adjacent parcels of MPSA 111-98-VII (Amended I)	FIGURE NO.
	Proposed QVPI Cebu Aggregates Project (Quarry and Crushing Plant)	1-1

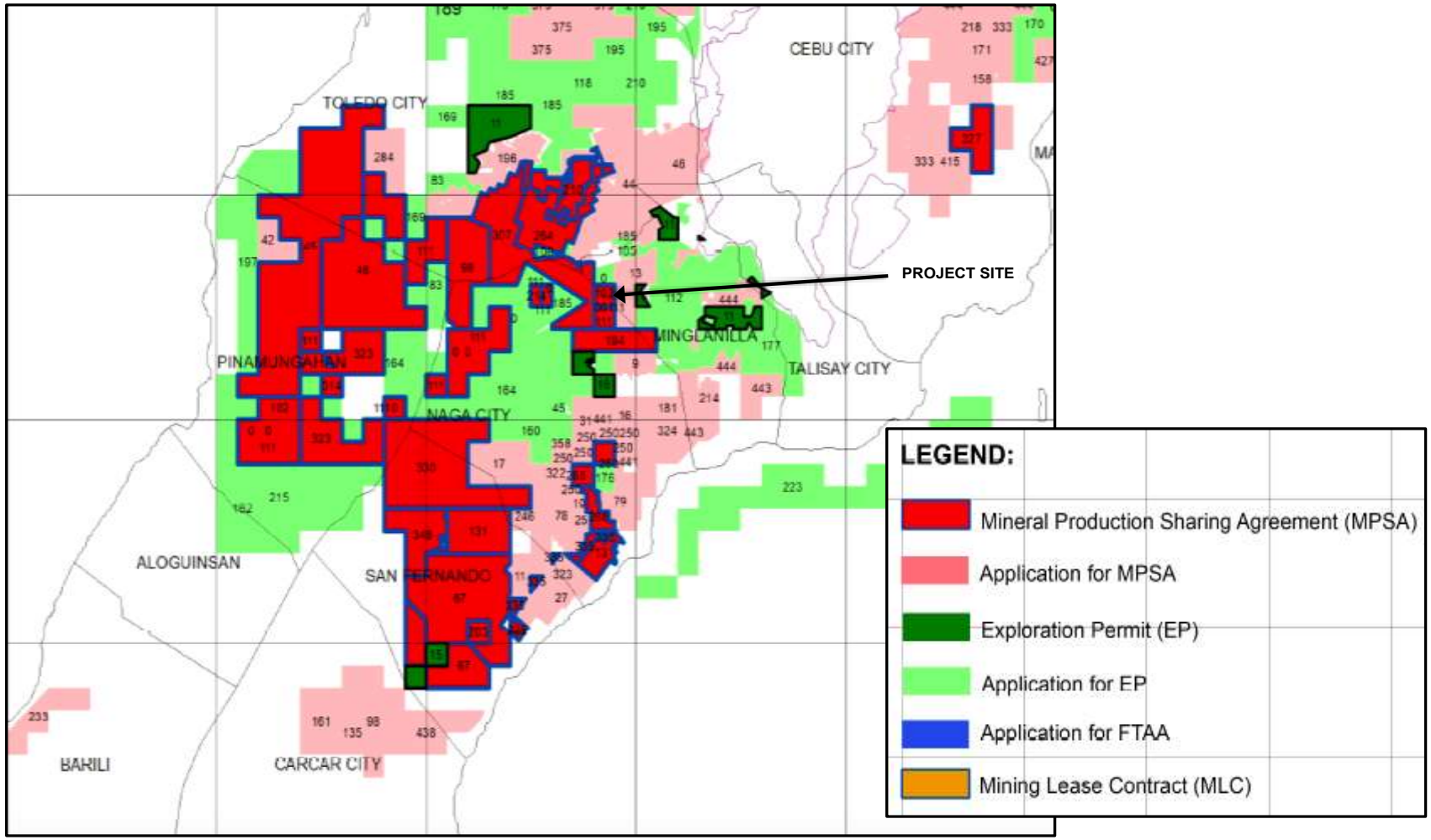
Map Source: QVPI, Google Earth

PHILKAIROS INCORPORATED	(Satellite Imagery) Vicinity Map of the Project Site. Parcel 10 is shown in red.	FIGURE NO.
	Proposed QVPI Cebu Aggregates Project (Quarry and Crushing Plant)	**1-2a**



Map Source: QVPI, FER (2018)

PHILKAIROS INCORPORATED	TITLE: **Vicinity Map of Parcel 10 of MPSA 111-98-VII (Amended I). The parcel adjoining Parcel 10 to the south is Parcel 5 and the area adjoining the northern side is an EPA block.**	FIGURE NO.
	Proposed QVPI Cebu Aggregates Project (Quarry and Crushing Plant)	**1-2b**



Map Source: MGB R7

PHILKAIROS INCORPORATED	Mining Tenement Map	FIGURE NO.
	Proposed QVPI Cebu Aggregates Project (Quarry and Crushing Plant)	**1-2c**

3. Project Proponent

In 1986, Teresa Marble Corporation (TMC), sister company of Quarry Ventures Philippines, Inc. (QVPI), acquired a small-scale mining permit for an area in Sitio Gaway-gaway, Barangay Uling, Naga also known as the Rosatta Quarry. In the year 1994, TMC turned over its rights to QVPI. The latter then applied for a Mineral Production Sharing Agreement (MPSA) in October 1997, which was denominated as APSA-096 (93) C. The application was approved by the DENR in May 1998 and denominated as MPSA 111-98-VII (delineated in red as shown in **Figure 1-1**).

On November 2015, QVPI applied for expansion of the area under MPSA 111-98-VII by annexing the areas covered by its application for Exploration Permit denominated as EXPA-000102-VII-A and EXPA-000102-VII-B. Thereupon, QVPI also applied for expansion of the area under MPSA 111-98-VII covered by its application denominated as EXPA-000214-VII. On June 2016, MGB issued an order approving the application of QVPI for expansion of its MPSA 111-98-VII. By virtue of this order, the areas covered by EXPA 000120VII-B and EXPA-000214-VII were denominated as parcels VI, VII, VII and IX, while the area under EXPA-000102-VII-A was denominated as Parcel X (delineated in blue as shown in **Figure 1-1**).

MPSA 111-98-VII (Amended I) has a total area of 2,028 hectares, which is distributed into ten (10) parcels as shown below.

Parcel No.	Area (has)	ECC Area (has)	Status
1	81	57	With ECC and under Operation Stage
2	81	57	With ECC
3	324	267	With ECC
4 & 9	81	70.5	With ECC and under Operation Stage
5	81	63	With ECC; under Development Stage
6	648	-	For ECC application
7	81	-	For ECC application
8	567	5	Remaining Areas for ECC Application
10	84	71	On-going ECC application

4. Projected Timeframe of the Project Implementation

Development Plan and Description of Project Phases

The Project has four (4) major phases that will cover the QVPI's entire business life cycle. These include: (a) pre-operation, (b) quarry development, (c) mine operation, and (d) decommissioning, abandonment, and rehabilitation phases. Brief discussions of the project phases are provided in the succeeding sub-sections.

4.1 Pre-Operation

The pre-operation stage of the Project is the totality of the activities and preparations prior to development and quarry operation. The major activities during the pre-operation phase are as follows:

- Compliance with all regulatory requirements such as the application and issuance of relevant government clearances and permits;
- Consultation with concerned Government agencies and the local population and endorsement of the LGUs for the commencement and operation of the project;
- Mine planning activities (i.e. topographic survey, mine development planning); and
- Planning of environmental mitigation measures.

4.2 Quarry Development

Upon the approval and completion of all mandatory regulatory requirements for the development and operation of the project, mine development activity will commence in preparation for the actual quarry operation. Mine development will start with land clearing activity into the areas that will be subjected to quarry operation.

Land clearing will commence ahead of mining which includes the removal of top soil and vegetation. Typical equipment to be used are bulldozers, Front-end loaders and rear-end dump trucks. Mine haul roads and access roads will be established during this phase. Mine development will be conducted progressively consistent with the prepared mining plan.

4.3 Quarry Operation

Upon the completion of all the support facilities and other project components, operation phase will initiate. Surface mining method will be utilized by the project operation. Quarry operation will be started from clearing and grubbing of the identified quarry area, stripping of overburden materials, followed by the development of the production benches, bench sampling, actual quarrying and hauling of limestone (marble and aggregates) and basalt. The topsoil or overburden will be transported to waste dump area or in a previously excavated/mined-out areas and/or designated topsoil stockpile area to be used in the progressive rehabilitation activity. Water impounded in the settling pond shall be utilized as the source of water for the sprinkling of haul roads and access roads. Environmental management and monitoring shall be regularly implemented during this phase to alleviate further environmental contamination.

4.4 Abandonment Phase

Consistent with the basic policy of the State to assure the availability, sustainability and equitable distribution of the country's natural resources, the Philippine Government adopts the policy that mining activities shall be managed in a technically, financially, socially, culturally and environmentally responsible manner to promote the general welfare of the country. One of objectives of this policy is the establishment of a functional post-disturbance land use capability. Moreover, remediation and rehabilitation of abandoned mines shall be accorded top priority to address the negative impacts of past mining activities. This is through protection and conservation of environment by identification of appropriate rehabilitation and mitigating measures per project component to inhibit and/or prevent any possible risks or adverse impacts that could endanger human and its environment.

Listed below are the major objectives of Final Mine Rehabilitation Plan:

- Rehabilitate/re-vegetate all the disturbed areas within the MPSA affected by quarry operations by reshaping/re-contouring affected areas prior to re-vegetation;
- Progressively rehabilitate the area to a condition agreed/suggested by the community during the stakeholder consultation;
- Minimize long term visual impacts due to the inactivity of the mine site by employing effective mitigation and measures creating landforms with vegetation compatible with the surrounding thus establishing a functional post-disturbance land use capability;
- Eliminate safety and health risks of the inactive mine site to the surrounding communities;
- Remove all unnecessary mine facilities and equipment used in operations and rehabilitate the areas prior to abandonment; and
- Provide the estimated cost that will be incurred from the implementation of the identified rehabilitation and/or decommissioning strategies and the consequent final land use.

A Final Mine Rehabilitation and Decommissioning Plan (FMRDP) will be prepared and submitted to the Mines and Geosciences Bureau for review and approval. Among the plans to be considered are appropriate rehabilitation and decommissioning plans that will best benefit the community.

5. Summary of the Major Impacts and Residual Effects

3.2 Summary of Key Impacts and Mitigation

Impacts on Land

Key Impacts	Impact Analysis	Management and Monitoring Plan
Impact in terms of compatibility with existing land use	The actual land uses near the project site are mainly agricultural and pasture land.	The proponent would stay within the boundaries of the MPSA, and would observe an adequate buffer area along its borders, to minimize any

Key Impacts	Impact Analysis	Management and Monitoring Plan
		negative effects the project may have to the adjacent areas. The proponent would also employ proper rehabilitation processes to ensure that the mined out will be backfilled so it could be used for agriculture, or other purposes deemed necessary by the LGU and the nearby communities.
Impact on compatibility with classification as ECA	The project site is considered an ECA due to its susceptibility to natural hazards. The project site is within the earthquake-triggered hazard and slope hazard areas of Metro Cebu. The site is not susceptible to flooding.	Implement the appropriate slope stability management programs. The mine pit should be properly designed to reduce slope stability risks/failures.
Impact in existing land tenure issue/s	There are no known CARP areas/CARP-related issues within the MPSA area. Further, there are no known CADC / CADT / CALC / CALT or with IFMA / CBFMA areas within the MPSA area.	No management and monitoring plan to be proposed.
Impairment of visual aesthetics	Aggregates extraction require an open pit method of quarrying which could be unsightly to most people, due to exposure and excavation of the soil.	In order to minimize the aesthetic impairment, the management will maintain the project site's buffer areas, which would provide a vegetated border. The mined-out areas would also be rehabilitated and re-vegetated following the conditions agreed/suggested by the host communities.
Devaluation of land value as a result of improper solid waste management and other related impacts	Extraction of aggregates only require physical removal of the desired material. There would be no chemical treatment, nor processing, within the project site. Due to this method, the main source of solid waste would only come from anthropological activities such as office wastes, equipment maintenance spillages, and kitchen wastes from the canteens.	The expected solid waste generated will be handled by a waste management plan, which would involve proper collection, treatment, and disposal of wastes. Recyclables and biodegradable waste may be sent to nearby Material Recovery Facilities for further use, or in the case of biodegradables, be broken down to compost. Equipment and vehicle maintenance will also be supervised by trained mechanics/personnel to ensure good running conditions. Storage depots for fuel and oils will be constructed to avoid soil and water contamination of oil and other chemicals. Generator sets will also be contained in a special room to avoid

Key Impacts	Impact Analysis	Management and Monitoring Plan
		contamination from accidental spillages.
Change in surface landform / geomorphology / topography / terrain / slope Change in sub-surface geology / underground conditions	The underground conditions for aggregates extraction would not be severely affected.	After removing the quarry materials, left over soil, and mineral specimens that did not meet quality requirements will be used as backfill. Aggregate quarry involves blasting to physically loosen rocks. The primary effect of this would be intense vibrations during the blasting. To avoid complications, like landslides, explosive materials will be strategically placed to avoid damages outside the area, and scheduled to minimize vibration only at the desired time.
Susceptibility to natural hazards	The potential earthquake generators that may affect the project area include the East Bohol Fault, Central Leyte Fault, and Central Negros Fault. Recent recorded earthquakes from 2013 and 2016 indicates that the faults are still active. The nearest fault to the project site is the Central Cebu Fault. The computed peak acceleration values (g) at the project area are as follows: 0.23g (at the quarry site, approximately 609 meters away from the Central Cebu Fault) and 0.13g (at the crushing plant, approximately 1000 meters away from the Central Cebu Fault). The site (Parcel 10) may show susceptibility to landslides in areas with thick overburden and steep slopes. However, the geology of the area is a massive volcanics which is not prone to landslides. This is due to the outcrops rich in volcanics and mineral deposits for aggregates. These may be considered not suitable for permanent habitation but may be developed for alternative uses subject to implementation of appropriate mitigation measures after conducting site-specific geotechnical studies.	During the quarry operation, these outcrops will be stabilized by benching to minimize landslide to the community and the site workers. Extraction of materials will also be strategically planned to maintain stability of the structures, and to avoid falling debris. Once the quarry has reached it decommissioning and abandonment phase, the stabilized and leveled site could be further developed. Settling ponds will be constructed to minimize sedimentation, and also to hold some of the precipitation before it flows through the tributaries. Trees and plants will also be planted along the buffer areas on the borders of the project sites to improve water retention in the soil.

Key Impacts	Impact Analysis	Management and Monitoring Plan
	There are tributaries near the project sites, though it is not highly susceptible to flooding.	
Impact to terrestrial ecology	Loss of habitat and vegetation due to land clearing. Increase of sound levels during quarrying activities	Vegetation that will be removed should be documented such that native trees should be replanted back or re-introduced to the site after all quarry activities will end. Introduction of exotic tree species in reforestation activities such as *Gmelina* and Maghogany should be discouraged. There will be light impact on the birds and other vertebrates since these species are mobile and can easily transfer away from the site once disturbance starts. This can be mitigated by protecting the habitat where there will be no quarry activities to be done, performing a strict environmental policy on no killing/hunting. Vegetative barriers via initial reforestation efforts should be made around the quarry area especially the eastern boundary to provide proactive solution to minimize long term sensory disturbance. To avoid the impacts to rare plants: (1) pre-project planning and design or (2) reconfiguring an existing project design. Project planning and design measures to avoid impacts may include arrangement of facilities on-site to avoid sensitive features. QVPI shall coordinate with the proper concerned agency on the use of endemic species (and possible threatened species) in the rehabilitation programs of the company.

Impacts on Water

Key Impacts	Impact Analysis	Management and Monitoring Plan
Change in drainage morphology / inducement of flooding	There is no natural drainage (river network) that traverses the MPSA area.	No management and monitoring plan to be proposed.
Siltation / Sedimentation	Sediment yields be accelerated due to increase in soil erosion.	There should be erosion control at the site (settling ponds, silt traps, etc.) to address increase siltation of waterways due to higher soil erosion in the area causing flooding of communities along the river system and the location and design of facilities shall be taken into consideration the watercourse to lessen the potential siltation of water should there be erosion. Settling ponds, sediment traps will be designed to accommodate enough runoff and sediment volume . Regular sediment extraction from the settling ponds/sediment traps.
Change in stream, lake water depth	Sediments could be transported to the tributaries and river systems by surface runoffs. This would lead to blockages and rise in the depth.	Sedimentation ponds will be constructed at the project site to minimize the sediments going into the tributaries from the quarry activities.
Change in bathymetry	There would be no port facility to be constructed for this project.	No management and monitoring plan to be proposed.
Depletion of water resources / competition in water use	The quarry activities would not be utilizing the water sources within the project site. The primary water utility will be for domestic use like washing of equipment, spraying over dusty areas, and drinking of the workers. Water source for such activities will be sourced from local water districts or water suppliers.	In cases that a community water supply would be directly affected by the quarry activities, the company would provide an alternative source for the community, or they would avoid the water source and provide safe access for the residents.
Degradation of water quality	One of the most critical resources in the area is the groundwater. The stripping of vegetation, overburden removal, frequent passing of heavy equipment and the exposure of subsoil would all lead to a decrease in groundwater recharge. The decrease in groundwater recharge may affect the amount of water withdrawn from the springs/wells surrounding the quarry area. Groundwater	To mitigate the potential impacts on groundwater quality, the following shall be implemented: • Administrative buildings shall be provided with toilets and sewerage systems. • All sewage will pass through septic tanks and no raw sewage shall be discharged.

Key Impacts	Impact Analysis	Management and Monitoring Plan
	resources surrounding the project area shall be closely monitored for any significant decrease in capacity. The project will be using hazardous materials such as fuel. Consequently, the project will also generate hazardous wastes such as used oil, used batteries, etc. from the equipment used for project operations. Sewage from the administrative building may also potentially contaminate the groundwater. Discharge from the siltation pond to the water bodies in the vicinity can potentially cause deterioration of the quality of these immediate water bodies. Runoff from the quarry operating areas can potentially increase TSS levels causing turbid waters. Various components of the quarry project will generate solid waste and sewage that has the potential of contaminating land and water resources.	• Facilities containing hazardous materials and hazardous wastes shall be lined with cement flooring and shall be provided with secondary containment facilities in case of spills. • Liquid wastes shall be fully contained prior to disposal. • Solid waste reduction and recycling shall be implemented. The project will involve clearing of vegetation and earthworks that will result to accelerated soil erosion in the area due to the exposure of bare soil to surface runoff. Eroded soil from the stockpile and quarry areas may eventually reach the surface waters (rivers and coastal waters) and cause siltation. Potential siltation of surface waters shall be mitigated through the construction of a drainage system with sedimentation ponds. To address Increased suspended solids in rivers/creeks due to storm silt-laden runoff from construction areas due to land clearing and earthmoving and reduced available water supply for downstream communities (washing, bathing, etc.), the following mitigation measures should be taken into consideration: • Timing of construction during driest months. • Proper location of additional access roads. • Limit vegetation clearing on access roads and facilities. • Construction of additional silt traps along roads. • Establishment of proper and appropriate drainage system along

Key Impacts	Impact Analysis	Management and Monitoring Plan
		catchment areas of the project. • Provision of proper and adequate settling ponds, silt traps to reduce siltation of nearby water bodies. Regular effluent monitoring will be conducted and appropriate treatment of the effluent will be done as necessary prior to discharge. A water management system to control the runoff and sedimentation will be established to minimize water quality impacts. Regular water quality monitoring will be conducted in the streams immediate the quarry site vicinity. A water management system will be established in the site to collect and treat wastewater. A solid waste management plan will also be established which will include a materials recovery facility and an engineered solid waste disposal site. Hazardous wastes from hospital/clinic will be collected by appropriate contractors or otherwise disposed-off in an ecologically sound manner.
Impacts to Freshwater ecology	Garbage and Sewage disposal Construction workforce may result in an increase of pollution from solid waste to rivers and creeks that will drain to the coast. Exposure of surface to heavy rainfall will lead to erosion. Steepening of slopes which will promote instabilities. Fresh to slightly weathered bedrock will be exposed to different agents of weathering: water will infiltrate the fractures and accelerate the weathering: will degrade the rock mass	Strict solid waste management policy shall be implemented within the project site. The environmental unit of the company shall conduct an information, education and communication drive to all workers to make fully aware of the proper waste segregation. Limit disturbance and removal of vegetation within the identified quarry area scheduled for operation. Design gradient of active mining pit is 10% on the average but can increase to 12 up to 15% depending on the

Key Impacts	Impact Analysis	Management and Monitoring Plan
	quality. Overburden and topsoil in waste dumps will increase lithostatic pressure in underlying rocks . Water quality impacts that may arise during heavy rains and silt that will be eroded.	deposit; gradient must not exceed the natural slope along the ridge (8 to 30%). Implement progressive rehabilitation immediately in mined-out areas to restore natural cover. Removal of overburden and topsoil from waste dump during rehabilitation will decrease. Septic tanks shall be constructed/installed in all offices that will be put up during the operation. Portalets shall be made available near the project site for workers to use instead the bodies of water. Drainages shall be properly be designed where potential water ways will be directed to a settling pond/s. The settling pond shall be carefully design that would accommodate the volume of water with silt and allow silt to settle.
Impacts to marine ecology	The project is located approximately 15 kilometers away from Tañon Strait and approximately 9 kilometers away from Cebu Strait. Considering its location, the project poses no significant impact on the marine ecologies of these water bodies.	No management and monitoring plan to be proposed.

Impacts on Air

Key Impacts	Impact Analysis	Management and Monitoring Plan
Change in local climate	The proposed project direct contribution to climate change is relatively small, and any climate change impacts in the region are not likely to be related to the project.	Energy-efficiency of equipment and machineries should be taken into account before procurement.
Contribution in terms of greenhouse gas emission	GHG emissions of the project would mainly come from land clearing/land use conversion, burning of fossil fuels.	Carbon Sink Program GHG accounting and reporting will be undertaken. Progressive rehabilitation of mined-out and degraded areas will be implemented to offset the GHG emissions of the project due

Key Impacts	Impact Analysis	Management and Monitoring Plan
		to land clearing (removal of carbon sink). Emissions of fossil fuel GHGs shall be mitigated through regular vehicle/equipment maintenance to maximize fuel efficiency. To offset the project's greenhouse gas emissions, a carbon sequestration program through reforestation shall be implemented by the proponent.
Degradation of air quality	Potential project impacts during construction and operation phase include increased emissions from vehicles, equipment and intermittent increase in suspended particulates.	Impacts on air quality shall be mitigated through proper maintenance of equipment and vehicles, and watering/dampening of roads to minimize dust resuspension. Speed limits along access roads shall also be implemented. All liquid fuel-powered equipment and vehicles will be maintained in accordance with the manufacturer's specification. Regular maintenance and monitoring of equipment and machineries will be implemented. As applicable, controlled watering of roads and access to the project will be undertaken to dissipate dust dispersion. Quarterly ambient air quality monitoring for air will be conducted. Same stations will be used for montioring purposes. Applicability and/or changes in monitoring stations will be also be regularly evaluated. Potential project impacts during construction and operation phase include increased emissions from vehicles, equipment and intermittent increase in suspended particulates. Impacts on air quality shall be mitigated through proper maintenance of equipment and vehicles, and watering/dampening of roads to minimize dust resuspension.

Key Impacts	Impact Analysis	Management and Monitoring Plan
		Speed limits along access roads shall also be implemented. Construction Phase Dust and noise emission - Earthworks/ site grading to be done will be by phase so as to limit exposure to particulates, access roads to be sprinkled with water or covered in cases of excessive fugitive dust emission. Dust suppression through heavy dust sprinklers/road watering trucks at various sensitive points such as haul roads. Operations Phase Fugitive dust emission from materials handling - Mineral handling and stockpiling areas will be covered properly. Transportation (trucks/ dumpers) will be properly covered. Suitable spraying agents to be sprinkled to prevent dusts from being airborne. Consolidation of haul roads & other roads will be sprayed water or suitable chemical additives for effective check of dust emissions. Stabilisation through vegetation at various critical dust generating points/ dumps. Emission from machineries - Proper maintenance of equipment and machineries to ensure compliance to emission standards.
Increase in noise level	Activities during construction and operation phases of the Project will increase the level of ambient noise. Noise from vehicles, equipment and quarry operation could cause stress and nuisance to the nearby communities living near the project site. Noise and other hazardous sound can also cause hearing impairment to workers and/or disrupt certain body functions.	Noise emission requires management measures. Forestation and plantation in perimeter-buffer areas are other effective controls for noise propagation. Enclosures of the respective noise generator are recommended for noise control. Quarry personnel will be required to wear ear protective devices and to minimize their exposure to excessive noise. Workers operating heavy equipment will be continuously provided with appropriate

Key Impacts	Impact Analysis	Management and Monitoring Plan
		personal protective equipment (PPE) or as necessary. Quarry activities will be well planned, undertaken in stages in sectional areas to somehow limit noise in a smaller/manageable area. As much as possible and practical, vehicle and equipment traffic to and from the project area will be done during regular working hours. This includes activities that will cause excessive noise. Machines and equipment will be operated at low speed and or power whenever practicable and switched off when not in use. Equipment and machines that are found to generate excessive noise compared to industry standards will be removed from site and replaced. All equipment and vehicles will be properly serviced, properly and regularly maintained and fitted with appropriate mufflers. Activities during construction and operation phases of the Project will increase the level of ambient noise. Noise from vehicles, equipment and quarry operation could cause stress and nuisance to the nearby communities living near the project site. Noise and other hazardous sound can also cause hearing impairment to workers and/or disrupt certain body functions. Noise emission requires management measures. Forestation and plantation in perimeter-buffer areas are other effective controls for noise propagation. Enclosures of the respective noise generator are recommended for noise control. Quarry personnel will be required to wear ear protective devices and to minimize their exposure to excessive noise. Quarry

Key Impacts	Impact Analysis	Management and Monitoring Plan
		operation shall be done during working hours. (6AM – 6PM, considering two shifts) Community consultations will be conducted especially at sensitive receivers as residential areas. The concerned barangays and stakeholders shall be informed of schedule of operations. Optimum traffic routes will be adopted to shorten time of exposure to noise. Noise level monitoring will be done as frequently practicable to be able to determine increased and excessive noise levels. In these instances, cause will be determined and remedial measures immediately applied. Applicability and/or changes in monitoring stations will be also be regularly evaluated.
Increase in noise and degradation of ambient air quality.	Generation of ground vibration, noise and flyrock from the blasting activities	Ground vibrations and noise can be controlled either by controlling the charge per delay or by controlling delay interval, if spacing and burden are within acceptable ranges. A proper blast design to ensure effective utilization of the energy of the explosives should be carried out to minimize the generation of vibrations, noise and flyrocks. To control flyrock, burdens must be sufficient to contain the explosive energy. This means that effective or instantaneous burdens are at least 25 times the blast hole diameters. Explosive weights should be monitored to avoid overloading into void spaces. Fissures, mud seams and weaknesses should be stemmed through rather than loaded with explosive. Additional burden may be needed if the face is broken up or irregular. The explosive column may have to be shortened to avoid the lightly-burdened collar region. In general, burden to diameter ratio of 14.2 or more should limit

Key Impacts	Impact Analysis	Management and Monitoring Plan
		flyrock to a manageable initial velocity of 100 ft/sec and range of 300 ft.

Impacts on People

Key Impacts	Proposed Options for Management Measures (Preventive and Mitigative)
Social Impacts	
1. <u>Psycho-social</u> • Loss of farmlands for informal settlers farming in agricultural lands. • Political and economic influence • Land Slide/ soil erosion • Opportunity loss from agricultural income due to removal of crops and use of the land for mine development and road works • Displacement of household within the MPSA area	• IEC on the tenement covered by the MPSA the nature and operation of the quarry project and mitigating measures. • Equitable payment of affected land according to the Mining Act • Alternative farm land be identified • IEC on the nature and operation of the Quarry and mitigating measures and the Mining Act IRR • Coordination with the concerned government agencies and LGUs on the relocation of the identified households to be displaced by the project • Appropriate mitigating measures according to law. - R.A. No. 8749 (Philippine Clean Air Act of 1999); - Philippine Clean Water Act of 2004) - R.A 9003 Ecological Solid Waste Management
<u>Economic</u> • Generation of employment	• IEC on nature of jobs the proponents require and qualification. • Consultation on job requirements and qualification • Local hiring priority for qualified barangay residents • Skills training to upgrade local skills of residents that can be hired by the project
<u>Economic</u> • Generation of livelihood opportunities by putting-up food stalls, variety stores and other services near the mining area and access road which might cause problems of congestion, peace and order and security breaches.	• Coordination with the Barangay LGUs to ensure authorized establishments and control of unauthorized entry of outsiders as well as the management of waste. • Buffer zones should be established around the perimeter of the mines.
<u>Health and Safety</u> • Entry of migrant workers with families which might cause health problems due to diseases, overuse of public utilities /services, competition of resources, social conflicts, peace and order, increase in pollution due to solid and liquid wastes.	• Management of entry of migrant workers. • Increase and train barangay tanods to be deployed in areas where migrant workers reside. • Proponent provide Health clinic with a Doctor, Nurse and Health workers • Health certificate for workers prior to hiring into the project

Key Impacts	Proposed Options for Management Measures (Preventive and Mitigative)
	• Partner with the LGU the implementation of the Social Development Program
Health & safety • Increase in traffic flow causing air (dust) and noise pollution	• IEC on proper scheduling of hauler trucks to avoid entry & dismissal of school children and late hours. • Sprinkling of roads during dry seasons.
• Impact of climate change such as La Niña and El Niño	• Gender Responsive Climate Change Adaptation. DENR Special Order 2007-653, • R.A.10121 Gender Responsive for Disaster Risk Reduction Management in the Barangays of men and women • Community-based Adaptation measures include the active participation of men, women, elderly and the youth in protection of water aquifer, conduct of massive information and education campaign, • establishment of protection measures for determination of areas most vulnerable to natural hazards "to forewarn people," and strengthening the protection of ecosystems
Economic • Loss of Livelihood	• Implementation of alternative Livelihood Projects
Economic • Employment Opportunities	• Employment Opportunities • Priority to members who are qualified and fit • Shall not exceed 60% of labor force

6. Identified Stakeholders

The Direct Impact Areas (DIA) of the Project are delineated based on the following guidelines (Section 10 of DAO 2017-15) as presented in the table below.

Component	Details	Area Delineation
Air	Areas where maximum Ground-Level Concentrations (GLC) of emissions higher than the ambient standard are predicted to occur.	Communities near the location (within 1-kilometer radius from the boundaries) of the mine pits and support facilities such as access and haul routes particularly in Barangays Cogon and Camp 8 in Naga and Minglanilla, respectively. Further, Barangay Cantabaco in Toledo has also been identified as a receptor due to its proximity with the quarry area. (As shown in **Figure 1-3a**).
Water	The extent of the water bodies where the water quality are projected to exceed the ambient standard. Areas along the river and river tributaries within and around the project site where silt may be	There are no tributaries or creeks that traverse the area of Parcel 10. The main drainage is the Pangdan River located at the northern flank of the tenement, which flows westward and eventually discharges to the Tañon Strait. (**Figure**

Component	Details	Area Delineation
	deposited due to earth moving activities and surface run-off.	**1-3b).** Another river system, which is a tributary of Abuno River is located on the eastern side of Parcel 10 as shown in **Figure 1-2b**. Abuno River drains southwards towards the Cebu Strait.
Land	Areas where there will be disturbance of habitat and removal of vegetation.	Areas where the mine pits and other support facilities of the Project are located. This includes also the access and haul routes for the Project. The DIA for land shall be confined within the area of Parcel 10 and a portion of Parcel 5 (**Figure 1-3c).**
People	Directly affected areas in terms of relevant socio-economic parameters.	Households within Parcel 10, which will be displaced by the quarry activities. Barangays Cogon and Camp 8 as host communities of the quarry operations.

The Indirect Impact Areas (IIA), on the other hand, shall be delineated for impacts on people and communities included in the vicinity of the DIA who will either benefit or be affected indirectly by the Project. By this definition, those areas outside the project area but within the jurisdiction of the City of Naga and Municipality of Minglanilla are considered as IIA.

During the Public Scoping conducted last April 2019, the following stakeholders were invited to participate:

- LGU officials from the City of Naga and Municipality of Minglanilla (Executive Offices – Mayor, Vice Mayor, Municipal Council);
- Department Heads of the Municipal Government (Municipal Planning, Agriculture, Health, Social Welfare and Development, Municipal Environment);
- Barangay Chairman and Council of each affected communities;
- DENR, EMB, DA, DepEd and other government agencies with mandate in this project;
- Through the Barangay council, sectoral representatives were also invited (PWDs, Senior Citizens, Health Units, IP Groups, Women's Sector, People's Organization, NGOs, etc.); and
- Other stakeholders identified.

These following identified stakeholders will also be invited in the scheduled Public Hearing.

7. Institutional Plan for Environmental Management Plan (EMP) Implementation

In compliance to the requirements of the DENR and other concerned government agencies, QVPI shall formulate a Mine Environmental Protection and Enhancement Officer (MEPEO).

The MEPEO shall have the following functions:

- Formulation and implementation of environmental conservation plans;
- Implementation of environmental impact and management procedures;
- Timely submission of Self-Monitoring and related reports;
- Coordination with the Multi-Partite Monitoring Team (MMT);
- Community programs during project operation;
- Compliance with all regulations imposed by the DENR, the MGB and other concerned agencies (e.g. LGU, other agencies) and,
- Implementation of the Final Mine Rehabilitation and Decommissioning Plan.

The MEPEO shall report directly to the Quarry Manager of the company together with the Pollution Control Officer (PCO), Health and Safety Officer (HSO) and the Community Relations Officer (CRO). The MEPEO will be a Mining Engineer or Geologist as stipulated in DAO 96-40. The MEPEO will take lead in the implementation of the Impacts Management Plan (IMP) and the Environmental Monitoring Plan (EMoP) as presented in this EIS.