

## 駐馬來西亞代表處經濟組 函

地址：55100Lvl 7 Menara Yayasan Tun Razak 200  
Jalan Bukit Bintang, Kuala Lumpur  
承辦人：李家慶  
電話：60-3-21620021

受文者：經濟部工業局

發文日期：中華民國111年1月7日  
發文字號：馬來經字第1110000005號  
速別：普通件  
密等及解密條件或保密期限：  
附件：如文(附件一)

主旨：有關馬商Memory Link Sdn Bhd擬與我商合作開發礦源乙案，如說明，敬請查照。

說明：

- 一、馬來西亞華裔地產開發商Memory Link Sdn Bhd執行董事Allen Wong Kheong日前洽本組表示，該公司在距離吉隆坡一個半小時車程之森美蘭州淡邊登雅市(Mukim Tampin Tengah, Negeri Sembilan)擁有近132.9公頃的農業用地，蘊藏豐富花崗岩(Granite)礦源。據該公司委託專業機構所作之初步地質分析報告顯示，當地大理石種類係「斑紋花崗岩(Porphyrific Granite)」，蘊藏量達47,295,000立方公尺，倘以每年開採20萬立方公尺計，估計可開採236年。
- 二、據A執行董事稱，鑒於鄰近地區已有一家中國大陸業者開採花崗岩並出口中國大陸等地，預計將可順利獲得政府核發開採執照，惟該公司係地產開發商，不具開採花崗岩專業技術，然素聞臺灣花東地區石材產業發達，加上我商信譽良好，爰盼與我商合作開發該礦源，合作模式相當彈性，可視我方建議洽商。
- 三、請惠協助轉知我相關業者，倘我業者有意進一步了解本案，

111/01/07 一般公文



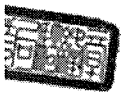
11100002030

可逕洽本組索取更詳細資料。檢附M公司提供之詳細地籍資料及地質分析報告等如附件，併請卓參。

正本：經濟部投資業務處

副本：經濟部工業局、經濟部國際貿易局、經濟部國際合作處

電子公文交換章



**MEMORY LINK SDN BHD** (646246-D)

A MEMBER OF  
**HAMBURG GROUP OF COMPANIES**



**Office Address & contact**

**Mr Allen Wong Khong (Managing Director)**

No.290 (1<sup>st</sup> Floor) Jalan Pudu

55100 Kuala Lumpur

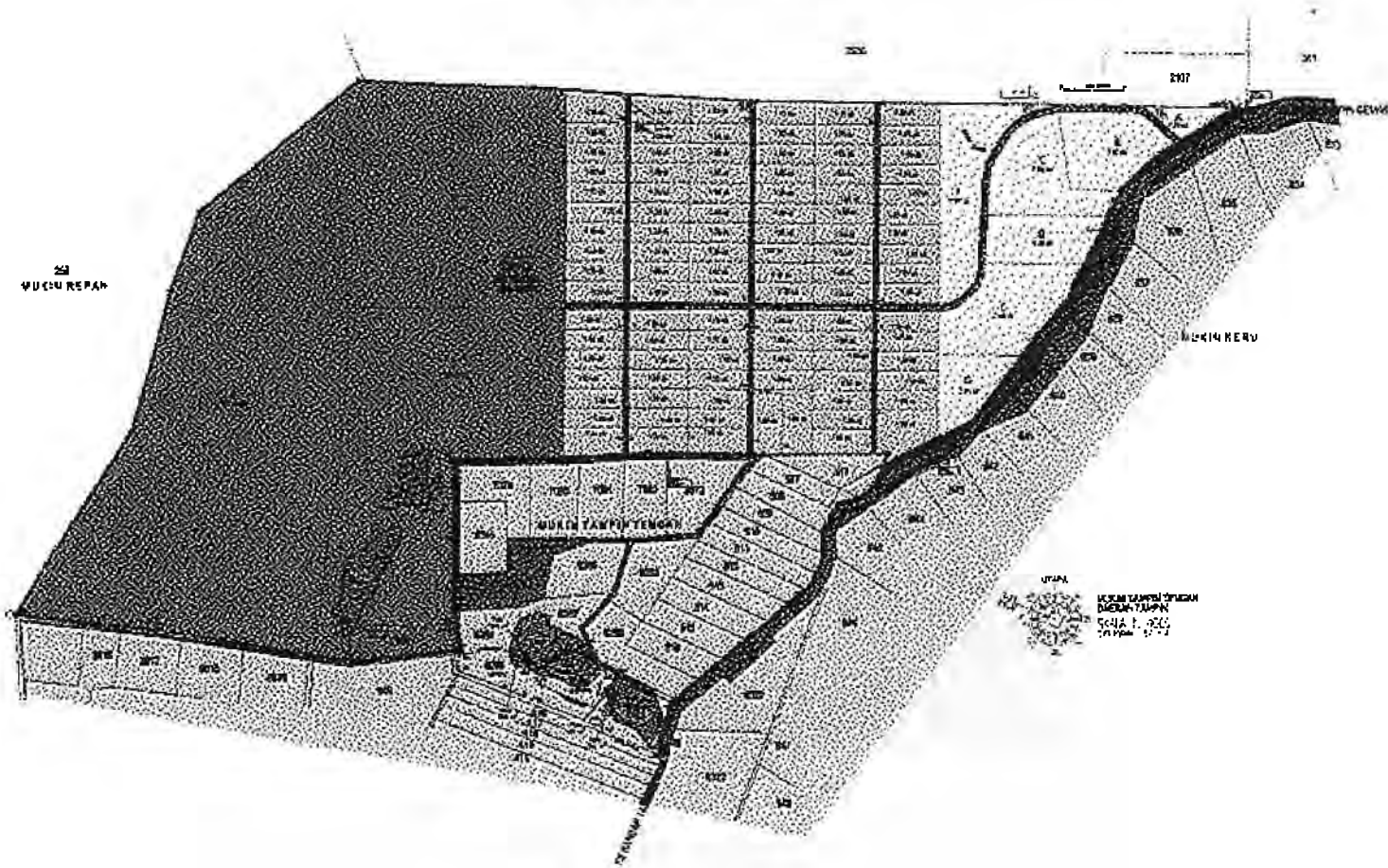
Malaysia

Tel: 603-21417200 Fax: 603-21482579

Mobile: 012-3719999

Email: [annen16@yahoo.com](mailto:annen16@yahoo.com)

Approximately 324 acres of subdivided freehold agricultural land rich with Granite in Tampin,  
Negeri Sembilan.







# LAND TITLE

Kanun Tanah Negara  
Borang SEK  
(Atas Keampatan)

GERAN

No. Hakmilik : 76324	Cukai Tahunan : RM11,164.00
----------------------	-----------------------------

Negeri : NEGERI SEMBILAN  
Daerah : Tampin  
Bandar/Pekan/Mukim/Country : Mukim Tampin Tengah  
No Lot : Lot 595  
Luas Lot : 132.8884 Hektar  
( 318 Ekar 1 Rood 20,000 Fole. )  
Kategori Penggunaan Tanah : Pertanian  
No. Lembaran Piawai : 87-A  
No. Pelan Diperakui : 9244  
No. Fail :

PENGISYTIHARAN TANAH PEKAN  
Dalam kawasan PEKAN TAMPIN TENGAH  
No. Pembecitahan Warta 524  
Berkuatku 4 Ogos 1994

Tanah yang diperlihatkan di atas adalah dipegang untuk selama-lamanya oleh huan punya pada masa namanya disebut dalam rekod ketuanpinyuan di bawah, bertakluk kepada peruntukan-peruntukan Kanun Tanah Negara, kepada kategori yang dinyatakan di atas dan kepada syarat-syarat nyata dan sekatan-sekatan kepentingan yang dinyatakan di bawah, sebagai batasan bagi pembayaran cukai tahunan yang sewajarnya.

Dengan perintah Pihak Berkuasa Negeri

Didaftarkan pada 23 Oktober 2002

T.M .....  
Pendaftar

Pelan tanah, bagi maksud pengeralan, adalah dikepikan pada Borang B1.

SYARAT-SYARAT NYATA

Tada



Hakmilik : 050606GERN00076324  
Tarikh : 17/09/2009  
No. Versi : 4  
No. Salinan : 03  
Muka Surat : 1 | 2 |

1349773

Kanan Tanah Negeri  
Borang SBK  
(Isi dan Keampai Belas)

GERAN

No. Hakmilik : 76324	Cukai Tahunan : RM11,764.00
----------------------	-----------------------------

Negeri : NEGERI SEMBILAN  
Daerah : Tampin  
Bandar/Pekan/Mukim/Country : Mukim Tampin Tengah  
No. Lot : Lot 595  
Luas Lot : 132.8884 Hektar  
( 328 Ekar i Kood 20.0000 Fois. )  
Kategori Penggunaan Tanah : Pertanian  
No. Lembaran Piawzi : 87-A  
No. Pelan Diperakui : 9244  
No. Fail :

PENGISYTIHARAN TANAH PEKAN  
Dalam kawasan PEKAN TAMPIN TENGAH  
No. Pemberitahuan Warta: 524  
Bertarikh 4 Ogos 1994

Tanah yang diperihalkan di atas adalah dipegang untuk selama-lamanya oleh tuan punya pada masa namanya disebut dalam rekod ketraiputyaan di bawah, terakluk kepada peruntukan-peruntukan Kanan Tanah Negeri, kepada kategori yang dinyatakan di atas dan kepada syarat-syarat nyata dan sekatan-sekatan kepentingan yang dinyatakan di bawah, sebagai balasan bagi pembayaran cukai tahunan yang sewajarnya.

Dengan perintah Pinaik Berkuasa Negeri

Didaftarkan pada 23 October 2002

T.M .....  
Pendaftar

Pelan tanah, bagi maksud pengenalan, adalah ditekankan pada Borang B1.

SYARAT-SYARAT NYATA

Tiada



Hakmilik : 050606CRN00076324  
Tarikh : 17/09/2009  
No. Versi : 6  
No. Salinan : 6  
Muka Surat : 1 [ 2 ]



## SEKATAN-SEKATAN KEPENTINGAN

TIADA

*Hendaklah dipertimbangkan apabila hakmilik dikeluarkan bagi sambungan*

Tarikh mula-mula pembermilikan : 7 April 1961  
 No. hakmilik asal (Tetap atau sementara) : GR1 11401 Makin Tampin Tengah  
 No. hakmilik yang terdahulu daripada ini :  
*(jika berlainan daripada di atas)*

## REKOD KETUANPUNYAAAN

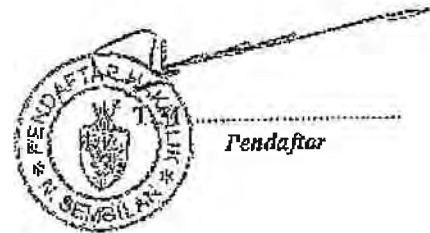
MEMORY LINK Sdn Bhd, 1/3 bgn.  
 No. Syarikat : 646246-D Terbit di bawah Akta Syarikat 1965,  
 NO. 35, JALAN TERASEK, BANGSAR, 59100 KUALA LUMPUR WJLAYAH PERSEKUTUAN KL

## REKOD URUSAN

No Pita 440/2009 Cadangan Pengambilan Tanah - Borang D  
 seluas lebih kurang 1,3700 Hektar  
 didaftarkan pada 12 Januari 2009 jam 08:31:30 pagi  
 (No Warta : 640 bertarikh 25 Disember 2008)  
 (No Rajukan Pak : (D)JLMJEPTG.NS(S)UPT/M/S/O8 JLD 1 BTIS 6 JAN 2009)

## PERKARA LAIN YANG MELIBATKAN HAKMILIK

Cukai tanah dipinda dari RM 7974 kepada RM 11154  
 menurut Seksyen 101 Kanun Tanah Negara mulai dari 1 Januari 2006  
 sebagaimana Warta Kerajaan No. P.U 7 bertarikh 18 Ogos 2005



Hakmilik : 050606GRNDL076924  
 Tarikh : 17/09/2009  
 No. Versi : 4  
 No. Salinan :  
 Muka Surat : 2 [ 2 ]

Ruas Tanah Negara  
Borang BJ  
(Badan Kesempatan Belas)

DAIRY

PELAN TANAH  
(Hakmilik Tetap)

Saya mengesahkan bahawa pelan yang dikepikan di bawah ini adalah salinan benar pelan tanah yang diperamini.  
Butiran hakmilik adalah seperti berikut :

Jenis dan No. Hakmilik	: GRN 76324
Negeri	: NEGERI SEMBILAN
Daerah	: Tampin
Bandar/Pekan/Mukim	: Mukim Tampin Tengah
Jenis Hakmilik	: Geran
No. Lembaran	: 87-A
No. Pelan Diperakui	: 9244
No. Lot	: Lot 595
Luas Lot	: 132.8884 Hektar ( 328 Ekar 1 Rood 20.0000 Polc. )

Bertarikh pada 5 hari bulan Jan. 2008



Pendaftaran



**TAMPIN  
GEOLOGICAL  
EVALUATION REPORT**



**TROPICROP**  
**MANAGEMENT SERVICES SDN. BHD. (216000-V)**

18A Jalan SS 21/58  
Damansara Utama  
47400 Petaling Jaya  
Selangor Darul Ehsan  
HP: 6013 3934933  
Email: [gtropacc158@yahoo.com](mailto:gtropacc158@yahoo.com)

## **MEMORY LINK SDN. BHD.**

**PRELIMINARY GEOLOGICAL ASSESSMENT AND RESOURCE  
ESTIMATION OF DIMENSION STONE PROJECT  
COVERING 132.9 Ha LAND COMPRISING PT 7553 – PT 7665  
(FORMERLY LOT 595), MUKIM TAMPIN TENGAH,  
DISTRICT TAMPIN, NEGERI SEMBILAN, MALAYSIA.**



**Prepared by: Tropicrop Management Services Sdn. Bhd.**

**Date: 01 October 2020**

## SUMMARY REPORT

<b>PROPERTY:</b>	PT 7663 to PT 7665 (formerly Lot 595), Mukim Tampin Tengah, District Tampin, Negeri Sembilan
<b>PROPERTY TYPE:</b>	Granite Dimension Stone Project
<b>LOCATION:</b>	Mukim of Tampin Tengah, Daerah Tampin, Negeri Sembilan, Malaysia.
<b>LAND TITLE:</b>	113 Lots (PT7663 – PT 7665) being subdivisions of former Lot 595
<b>CATEGORY OF LAND USE:</b>	Agricultural status
<b>ROCK TYPE:</b>	Porphyritic granite
<b>MINING LICENCE:</b>	To be applied for is found viable
<b>PROJECT PROPONENT:</b>	Memory Link Sdn. Bhd.
<b>ROCK RESERVE:</b>	
	Recoverable granite (90% R.F.): 75,321,677 m <sup>3</sup> Estimated merchant blocks (net): 47,295,006 m <sup>3</sup>
<b>PROPOSED THROUGHPUT:</b>	200,000 m <sup>3</sup> /annum (net)
<b>SUSTAINABLE LIFE:</b>	236 years (approx.)

## TABLE OF CONTENTS

SUMMARY SHEET .....	4
1.0 Introduction .....	5
2.0 Terms of reference .....	5
3.0 Executive summary .....	6
4.0 Location and access .....	7
5.0 Aerial drone survey .....	7
6.0 Topography and adjacent land use .....	7
7.0 Geology .....	8
8.0 Rock resource .....	8
9.0 Other potential operations .....	11
10.0 The factory /processing plant .....	11
11.0 Neighbouring operation .....	11
12.0 Proposed land utilisation .....	11
13.0 Discussion and comments .....	12
14.0 Conclusion and recommendations .....	13

### PLATES

- PLATE 1: Panoramic view of the land at the western sector
- PLATE 2: Panoramic view of the land looking down from higher ground at the western end of the property.
- PLATE 3: Entrance into subject property at the western sector.
- PLATE 4: A large pond created by the sand mining operation commencing in year 2017
- PLATE 5: A view of the sand mining operation at site.
- PLATE 6: Closer view of the area mined for sand, exposing numerous large granite boulders
- PLATE 7: A close-up view of the granite boulders showing its porphyritic texture.
- PLATE 8: Numerous large granite boulders exposed at the eastern sector of the property.
- PLATE 9: Granite dimension stone blocks recovered by the neighbouring operation

**PLATE 10:** Numerous boulders exposed on adjacent land to the subject property.

#### **PLANS**

**PLAN 1:** Title plan of Lot 595 Tampin Tengah, Negeri Sembilan

**PLAN 2:** Location plan of the Project site

**PLAN 3:** Geology of Tampin area

**PLAN 4:** Aerial drone survey plan (google)

**Plan 4A:** Aerial drone survey plan

**PLAN 5:** Aerial drone survey plan showing topography

**PLAN 6:** Proposed land utilisation plan

**PLAN 7:** Legend for the geological cross-sections.

#### **GEOLOGICAL CROSS-SECTIONS**

Figures (Lines) 1 - 14

#### **CONSULTANT RESUME**

- CV of Dr. Lim Teong Hua
- Major projects accomplished by Tropicrop Management Services Sdn. Bhd.

**MEMORY LINK SDN. BHD. (Co. No.200401007742/646246-D)**

**PRELIMINARY GEOLOGICAL ASSESSMENT AND RESOURCE ESTIMATION  
ON POTENTIAL DIMENSION STONE PROJECT  
PT 7553 – PT 7665, MUKIM OF TAMPIN TENGAH, DAERAH TAMPIN,  
NEGERI SEMBILAN, MALAYSIA.**

**1.0 INTRODUCTION**

Tropicrop Management Services Sdn. Bhd., a geological consulting firm, was engaged by Mr. Allen Wong of Memory Link Sdn. Bhd. (Co. No. 200401007742/646246-D) to undertake a preliminary geological assessment and resource estimation on the land held under Lot 595, Mukim Tampin Tengah, Daerah Tampin, Negeri Sembilan. This piece of land measures 132.889 Ha (328.366 acres) and is currently categorised under agriculture status and has been subdivided into 113 lots (PT 7553 to PT 7665) as illustrated in Plan 1.

The main objective of the current assignment is to ascertain the potential of this property for granite dimension stone operation. The exercise involved an overall assessment of the area, as well as a preliminary estimation of the quantity of granite within the property to ensure that there is sufficient resource for the said purpose.

A drone survey over the subject property covering the 132.889 Ha was carried out in August-September 2020. Owing to the bad weather and the hazy atmospheric conditions of late, the drone flight has to be repeated over several occasions. Subsequently, a site visit to the quarry was made by the Consultant Geologist, Dr Lim Teong Hua, on 18 September 2020 to assess the land layout and site conditions.

The information including the observations gathered during the site visit, was incorporated in the report as presented below.

**2.0 TERMS OF REFERENCE**

The terms of reference for the above-mentioned assignment comprise:

1. An inspection of the potential dimension stone site
2. Undertake an aerial drone survey over the entire 132.9 Ha site.
3. Based on the drone survey and site visit, select 100 - 200 acres for consideration for dimension stone project.
4. Undertake a preliminary geological rock resource estimation.
5. Preparation and submission of a geological report on the potential for dimension stone quarry.



### 3.0 EXECUTIVE SUMMARY

- 3.1 The Quarry site, located Northeast of the Tampin township, is reached by way of the Tampin – Gemas trunk road. At Kg Hulu Keru, about Km 6, turns south into a branch road towards Ladang Bt Batu. After another 1 kilometre on this road, turn right again into Jalan Keru-Batu Belang, and the quarry is located about 1 km further on the right.
- 3.2 The quarry working area is centred on the higher hilly ground is with elevation ranging from 125 m to 240 m.
- 3.3 An abundant of granite boulders occurs in the subject property. Some of the granite boulders are more than 10 m across.
- 3.4 The rock type found at this quarry site is whitish to light-gray coarse-grained porphyritic biotite granite. The feldspar phenocrysts vary in sizes, and can be as big as 5 cm across.
- 3.5 Initial observation indicates that the area is suitable for dimension stone operation.
- 3.6 An aerial drone survey was carried out over the entire 132.889 Ha land, and both topographic and terrain maps were generated.
- 3.7 The total resource within Lot 595 is estimated using geological cross-sectional method. A preliminary granite resource of 74,788,760 m<sup>3</sup> is estimated. The discounted (net) merchant granite blocks volume is estimated at 46,959,128 m<sup>3</sup>.
- 3.8 At a proposed throughput of 200,000 m<sup>3</sup>/annum, this resource is sufficient to sustain the mining operation for more than 200 years.
- 3.9 Application for mining licence is yet to be submitted.

#### 4.0 LOCATION AND ACCESS

The Project Site in question is located approximately 6 km by road and southwest of the Tampin township. The site is reachable by normal saloon car travelling along the Tampin – Gemas trunk road, and at Kampong Hulu Keru which is located at approximately kilometre 6, take a turn into a branch tarred road heading southward towards Ladang Bukit Batu. Travelling another kilometre from this junction, take another right turn into a yet smaller tarred road (Jalan Keru-Batu Belang), and the quarry site is located just 1 kilometre further on the right (Plan 2 refers).

The land in question comprises Lot 585 covering approximately 132,889 Ha (328,369 acres). The large portion of the southern boundary of the land is bounded by the tarred road, Jalan Keru-Batu Belang. The Northern boundary adjoins an existing dimension stone quarry.

#### 5.0 AERIAL DRONE SURVEY

A drone survey was carried out over the Subject Property in August and September 2020 to generate an up-to-date plan of the land and its usage. Detailed topographic and terrain maps of the area is generated from this survey (Plans 4 & 5 refer).

Sand mining operation is confined to the southwestern sector of the area. The total area involved for this activity approximately 45 acres.

#### 6.0 TOPOGRAPHY AND ADJACENT LAND USE

The subject property is roughly L-shaped. The eastern limit of the land is bordered by the trunk road (Plan 4 refers). The main entrance into the subject property is from the south via a dirt road which leads into the project site in a northerly direction. The land along this access road has also been acquired by the project owner. Hence, there is no issue with right of way.

An area of approximately 45 acres at the southwest is currently being mined for sand. This operation has commenced sometime in year 2017. Over here, a large retention pond of approximately 6.5 acres has been created. The sand mining activities have also exposed numerous granite boulders of various sizes at the hill slopes, some of which are up to 10 m in dimension. From the sand operating area, another dirt road leads eastward, cutting through the middle of the property all the way to the eastern sector. Abundant granite boulders are also exposed at the eastern sector of the property (Plates 5, 6 & 8 refer). At the extreme east, the granite bedrock appears to be near-surface.

The highest parts of the area are located in the Northwest where elevation of up to RL +240 m is reached. The central and eastern parts are lower, at elevation of approximately RL 120 m and lower.

Immediately north and adjoining this property is Halaman Mantap Sdn. Bhd. (formerly Mahawira Sdn. Bhd) which is a granite dimension stone operation recently revived in late 2018.

The nearest prominent dwelling is Kampung Hulu Keru, situated approximately 1,6 km from the subject property. The adjoining land in every direction is essentially covered by oil palm plantation of differing acreages, ranging from estates to small holders. Some fruit cultivation, including dragon fruits and durian was noted.

## 7.0 GEOLOGY

In terms of the regional geology, this property is located well within a large undifferentiated granite body which intrudes into Triassic sedimentary rocks (with meta-tuffs and metavolcanics) to its west, and Silurian sedimentary rocks to its south (Plan 3 refers).

The rock type in the subject property is coarse-grained porphyritic biotite granite of whitish to light-grey varieties (Plate 7 refers). The granite is composed mainly of minerals such as quartz (20 - 35%), feldspar (50-70%) and biotite (5-10%). The quartz occurs as opaque to vitreous subhedral grains of 0.2 to 0.8 cm sizes. The feldspar occurs as phenocrysts (laths) of 2 to 6 cm sizes. The feldspar exhibits flat crystal planes with a vitreous appearance. The biotite is black in colour and finer, occurring generally in clusters of 0.1 to 1.0 cm size. Accessory minerals include chlorite and tourmaline.

The weathered overburden in this area can be quite thick. Inferring from the neighbouring quarry, the soil profile is anticipated to vary from 10 to 25 meters. The general locally demonstrates a deep weathering profile, with the weathered zones penetrating through the granite joint planes down to very deep levels. The joint system however, is very wide, often more than 3 meters apart. The weathering effect occurs in such a manner that it is extremely intense along the joint planes but does not penetrate significantly deep into the granite block itself. This phenomenon has resulted in the occurrences of numerous large granite boulders within the weathered soil profile. At the sand mining area as well as the general surroundings, large granite boulders are abundant, and often protrude out from the ground surface (Plates 5, 6, 8 & 10 refer). Iron staining owing to the iron content being leached out from the biotite mineral is very obvious along to the joint planes, but generally does not penetrate more than 2 cm into the granite blocks. Granite boulders in this area can reach the size of more than 10 m across.

## 8.0 ROCK RESOURCE

The rock resource within the subject property is evaluated using the Cross-sectional Method. The geologic cross-sections were drawn using Global Mapper using the data gathered from the drone survey. A total of 14 North-South trending cross-sections were drawn at intervals of about 156 meters (Plan 7 refers). The individual cross-sections are also illustrated in Figures 1 to 14 under section "Geological Cross-sections" in the back pages.

The mining parameters assumed in this evaluation is summarized as follows:

Bench Height	- 12 – 25 m (single – double benching)
Bench angle	- 70° to 75°
Berm Width	- 5 - 10 m
Overall Pit Slope	- 60°

The rock volume between two adjacent cross-sections is the product of the mean sectional area of the two adjacent sections, multiplied by the respective distance between the two cross-sections. To derive the area of individual cross-section, a mine pit profile at an overall slope of 60° is projected downwards until the pit bottom. The space at the pit bottom is maintained at minimum 100 m across to ensure there is sufficient room for the quarry equipment and vehicles to operate smoothly and freely. On this basis, the pit bottom for the project area is taken down to datum at RL 0 m except for a section line 14 which is at RM 150 m (Table 1 refers). The sectional volumes from each pair of cross-sections are then aggregated to derived the total in-situ rock resource of the proposed working area (Plan 6 refers). A discount of 10% is applied to this total

volume to take into consideration operational and quarrying losses.

A further discount of 63% is applied to derived the volume of merchant granite blocks. It should be noted that in the dimension stone business, the marketed volume of the stone block is discounted by about 20 cm for all the three block dimensions. One  $m^3$  of granite rock is approximately 2.7 tonnes, but owing to the discounted dimensions of the blocks, one  $m^3$  of the merchant granite block has a weight that could vary from 4.2 to 4.3 tonnes. Quarry productions and sales figures (to block buyers) are normally quoted in  $m^3$ , but payment of state royalties, haulage and freight costs, and custom duties are based on actual rock tonnages.

The total granite resource is calculated at 75,3421,677  $m^3$ , after assuming a mining loss at 10%. The merchant granite block recoverable, after a discount for each of the 3 dimensions, is approximate 63% of actual size. Therefore, the merchant granite blocks recoverable from the mining selection of 160 acres down to datum RL 0 m is computed at 47,295,006  $m^3$ .

**Table 1: Granite resource computation using cross-section method**

No.	Line	Datum RL m	Section Area m <sup>2</sup>	Mean Area m <sup>2</sup>	Distance m	Volume m <sup>3</sup>	Remarks
<b>A. Resource above datum RL +125 m</b>							
1	Line 1	n.a.	0				Outside selection Outside selection elevation too low
2	Line 2	n.a.	0				
3	Line 3	RL +125m	0		63	0	
4	Line 4	RL +125m	0		156	0	
5	Line 5	RL +125m	5,280	2,640	156	411,840	
6	Line 6	RL +125m	10,690	7,980	156	1,244,880	
7	Line 7	RL +125m	21,160	15,920	156	2,483,520	
8	Line 8	RL +125m	20,890	21,025	156	3,279,900	
9	Line 9	RL +125m	25,670	23,200	156	3,631,680	
10	Line 10	RL +125m	28,940	27,300	156	4,259,580	
11	Line 11	RL +125m	19,290	24,115	156	3,761,940	
12	Line 12	RL +125m	39,640	19,465	156	3,036,540	
13	Line 13	RL +125m	16,030	17,035	156	2,782,260	
14	Line 14	RL +125m	9,000	9,515	156	1,484,340	
Total volume above datum RL +125 m						26,376,480	
Less overburden volume (160ac x 4,000 m <sup>2</sup> x 12 m depth)						7,680,000	
Total recoverable granite						18,696,480	
Estimated merchant granite blocks (net, discounted)						11,739,650	
<b>B. Resource below datum RL +125 m</b>							
1	Line 1	n.a.	0				Outside selection Outside selection
2	Line 2	n.a.	0				
3	Line 3	RL 0 m	31,390	15,695	63	988,785	
4	Line 4	RL 0 m	32,250	31,820	156	4,963,920	
5	Line 5	RL 0 m	18,850	25,550	156	3,985,800	
6	Line 6	RL 0 m	27,610	23,230	156	3,623,880	
7	Line 7	RL 0 m	39,480	33,545	156	5,233,020	
8	Line 8	RL 0 m	38,750	39,115	156	6,101,940	
9	Line 9	RL 0 m	22,680	30,715	156	4,791,540	
10	Line 10	RL 0 m	47,570	36,128	156	5,479,500	
11	Line 11	RL 0 m	45,470	46,520	156	7,257,120	
12	Line 12	RL 0 m	75,150	60,310	156	9,408,560	
13	Line 13	RL 0 m	39,470	54,310	156	8,472,360	
14	Line 14	n.a.	0	16,735	156	2,610,660	
Total volume below datum RL +125 m						62,916,895	
Total recoverable granite (90% R factor)						56,625,197	
Estimated merchant granite blocks (net, discounted)						35,555,356	
<b>TOTAL RECOVERABLE GRANITE VOLUME</b>						<b>75,321,677</b>	
<b>TOTAL MERCHANT GRANITE BLOCKS (A+B)</b>						<b>47,295,006</b>	

At a proposed annual operating throughput of 200,000 m<sup>3</sup> (net volume), it would be necessary to excavate almost double the rock volume. At this annual capacity, the granite resource within the area investigated can sustain the operation for approximately 236 years.

The recoverable granite above datum RL 125 m amounts to 18,696,480 m<sup>3</sup> after deducting 10% for mining losses. The merchant granite blocks (net/discouted) is estimated at 11,739,650 m<sup>3</sup>. At the throughput of 200,000 m<sup>3</sup>/annum, this resource alone can sustain the operation for approximately 56 years. At the end of this 52-odd years, the entire 328-acre land would be transformed into a rather flat property, which can be utilised for various purposes.

One m<sup>3</sup> of the granite blocks can produce approximately 32 – 35 m<sup>2</sup> of granite slabs. Therefore, the proposed granite annual block capacity is sufficient to produce at least 6.4 million m<sup>2</sup> of granite slabs. However, most operation will sell the granite both in the form of blocks as well as slabs,

## 9.0 OTHER POTENTIAL OPERATIONS

The present exercise is made based solely on dimension stone potentials. Since the rock reserve is huge for dimension stone venture, the operator may wish to investigate the potential of additional rock usage.

As there will be considerable amount of waste or reject rocks, the potential for agro-stone manufacture can also be considered at a later stage.

## 10.0 THE FACTORY & PROCESSING PLANT

The factory and polishing plant can be located at the south-western sector of Lot 595 where the land is lower and considerable flatter. Moreover, there is already an existing large pond which could supply the water required by the factory.

## 11.0 NEIGHBOURING OPERATION

The land immediately to the north of the subject property was once operated as a dimension stone venture by Mahawira Sdn. Bhd. until the late 1990s. However, the operation went into financial stress in early year 2000 and was acquired by Halaman Mantap Sdn. Bhd. recently.

Halaman Mantap Sdn. Bhd. uses modern technology for the granite stone operation. Large circular saws were used to cut the granite blocks at the working rock face. A large proportion of the granite blocks is exported to China. A fairly large processing plant for the production of slabs was recently commissioned, using new circular cutters and automatic polishing machines. The first phase of this operation is projected at approximately 100,000 m<sup>3</sup> of granite blocks. Part of this blocks is processed with initial annual capacity estimated at 1.5 million m<sup>2</sup> of granite slabs.

## 12.0 PROPOSED LAND UTILISATION

The proposed land utilisation for the subject property is illustrated in Plan 8.

The mining selection is demarcated as Block A covering approximately 160 acres. This block comprises the higher ground with existing elevation in excess of RL +125 m. Mining operation should start at the highest levels and worked downward, slice by slice. As such two distinct initial working rock faces are discernible, and labelled as Area A and Area B. These areas are filled with abundant rock boulders which, together with the soil overburden, would have to be removed to exposed the underlying granite bedrock.

Should it be necessary to acquire granite blocks quickly, a third working face can be sited at Area C. Over here the granite bedrock is near-surface as indicated by the abundant huge granite boulders outcropping (Plate 8 refers). However, a couple of drill-holes need to be sunk to ensure the granite here is fresh and of good quality. As the elevation here is quite low, extended workings over here is rapidly create a mining open pit.

Block B comprises essentially the existing sand mining areas which is lower ground with elevation of less than RL +120 m. This area measuring about 83 acres, is proposed for the siting of the office buildings, the granite block stockyards, and also the processing plant. The latter shall be sited next to the existing pond so ensure ready water supply. The power sub-station shall be sited at a convenient corner within Block B. The initial soil overburden from Block A can be dumped here to level up the area to construct a large tract of flat land for the stockyards and processing plant usage.

Block C which covers approximately 80 acres, shall be used for the dumping of excess soil overburden and rock wastes. This area shall also be levelled to create a large tract of flat land for various usage at a later date.

### 13.0 DISCUSSION AND COMMENTS

The rock resource figure presented using the cross-sectional method of evaluation represents a fair estimate. No detailed mine pit design (with mining access roads, etc) has been incorporated and sectional profiles with overall slope of approximately 60° are assumed. For the current purpose of evaluation, a detailed mine planning exercise is considered unnecessary.

The rock resource is computed using mean cross-sectional areas at slightly over 150 meters section intervals, and assuming final near vertical walls at the lot boundaries with no batter slopes allocated. No drilling investigation has been carried out, and the overburden volume is based on visual observation both at the subject property and in the neighbouring operation. A comprehensive drilling programme should be carried out as soon as possible in order to verify the overburden thickness, and also to determine the qualities and types of rocks within the concession so as to allow proper decision on the location to commence block cutting operation.

A mining recovery factor averaging 90% has also been applied to the in-situ rock resource for the computing the Recoverable Rock Resource. The discounted factor for deriving merchantable granite blocks as assumed at 63%, based on the experience gathered from the neighbouring operation. These factors assumed may require adjustment after the drilling data is attained, or after a considerable operating experience at this site.

## 14.0 CONCLUSION AND RECOMMENDATIONS

The property under consideration comprises a whitish to light grey coarse-grained porphyritic granite. Owing to the widely spaced joint systems of 3 meters or more, the granite rocks here are suitable for the production of dimension stones.

Weathering in this general locality is very intense and can go down to very deep levels of up to 25 meters. Within the granite body however, weathering is confined largely to the joint planes and does not penetrate much into the granite rock itself owing to the resistant minerals of feldspar and especially quartz. Owing to this phenomenon, the weathering along joint planes has left behind numerous large granite boulders, sometimes more than 10 m across. Initial observation indicates that this area is suitable for dimension stone operation.

The total recoverable granite resource is estimated at 75.322 million m<sup>3</sup>, after discounting 10% for mining losses. The merchant granite blocks (net, discounted dimensions) resource is computed at 47.295 million m<sup>3</sup>.

At a proposed annual output of 200,000 m<sup>3</sup> of merchant blocks, the granite resource within the mining selection (Block A) is sufficient to sustain the operation for approximately 236 years. The resource above datum RL +125 m alone is able to sustain the operation for 58 years.

In view of the above findings, it is recommended:

1. The company can proceed with the dimension stone project as intended since the project is viable and there are sufficient resources to sustain a large granite dimension operation on the subject property.
2. The company should undertake a comprehensive diamond drilling programme over the concession to ascertain the soil overburden depths and the quality and varieties of granite rocks in the area. In view of the large capital outlay required for dimension stone venture, this evaluation stage by drilling is strongly recommended in order to reduce potential project risks. The most important criteria to note would be the joint system and spacings, and the freshness of the underlying granite bedrock.
3. The data obtained from this investigation work will be useful to guide the investor/operator in determining the priority areas to develop. In view of the large-scale operation intended, it is important to establish the actual granite bedrock profile in the area. It should be noted that the current evaluation is based on an assumed average overburden depth, and that there are no structural deformations in the bedrock.
4. The invitation for a prominent China dimension stone player to provide operational know-how, technology, and machinery investment is an excellent and necessary move. It will reduce the project risk, and at the same time, enable the project to tap into the existing network of overseas consumers.



Dr. Lim Teong Hua  
Consultant Geologist  
Ph.D. (UK, Oxf.), B.Sc. Hons (U.Malaya)  
MIMM (IUM, UK) Reg. No. 479287  
Prof. Geologist (Lembaga Ahli Geologi M'sia)  
Reg. No. PG 1153

Consultant Geologist  
Dr Lim Teong Hua, PGeol  
01 October 2020

