

**CHAPTER 10**  
**STUDY FINDINGS**

 KenEp Consultancy & Services 



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### **10.0 STUDY FINDINGS**

The Environmental Impact Assessment (EIA) **Proposed Granite Quarry Operation on PT 23066 and PT 23741 With An Area of 13.4862 Hectares (33.325 Acres) In Mukim Kuala Paka, District of Dungun, Terengganu Darul Iman** describes its inherent bio-geophysical and economics system. The impacts that will arise from the activities of the proposed project have been highlighted and its subsequent mitigating measures have been proposed.

The available rock reserve to be quarried and the readily available demand from market have made the proposed quarry viable. The study has shown that with proper mitigation measures undertaken, the proposed Project will not present any significant long-term residual impacts on the environment and population in vicinity the Project area.

Activities associated with the operations such as overburden removal, blasting, aggregate processing operations may cause significant impacts if proper management and controls are not undertaken. However, with the proper mitigation measures recommended in this report, the proposed quarrying operation could be carried out in an environmental friendly manner.

The proposed quarry is not expected to generate any disturbance to surrounding as there is adequate buffer zone of 10m-20m from the boundary along the perimeter of Project site, for the quarry operation to be carried out in an orderly manner. Therefore, the Project Proponent have place high consideration to implement mitigation measures and controls with high commitment in order to avoid or at least be minimized and localized the impacts within the boundary of the Project area.


To ensure effectiveness of the measures formulated, monitoring programmes (see **Chapter 9**) are recommended. Results of the monitoring programmes would be useful in determining the residual impacts (if any) that may result from the proposed quarrying operations on the environment and remedial action to be undertaken as soon as possible if necessary.

**Hexatrend Quarry Sdn. Bhd.**'s effort to commission an EIA study, thereby taking into consideration all environmental-friendly approaches (such as open-pitting quarrying technique) and also incorporating pollution control measures (especially for air, vibration, noise and water quality control) in their future operation is commendable and should be given a strong support from all relevant parties. Rehabilitation programme of the quarried area is also part of the long-term planning for the Project.

Given the favourable outcome of the environmental assessment undertaken in this study, it is therefore recommended that the Project should be granted a full environmental approval by the Department of Environment and other authority concerned in order for the Project to commence its operation.



# REFERENCES



— KenEp Consultancy & Services



## REFERENCES

Department of Environment (2016), Environmental Impact Assessment Guideline in Malaysia

Department of Environment (2018), EIA Guidelines for Quarry and Mining.

Environmental Essential For Siting of Industries In Malaysia (EESIM)

Department of Environment (2019), Guidelines for Environmental Noise Limit and Control, Third Edition.

Federal Department of Town and Country Planning (2016), National Physical Plan 3.

Government of Malaysia, Environmental Quality Act 1974 (Act 127).

Government of Malaysia (2019), Occupational Safety & Health (Noise Exposure) Regulations Act 1994 (Act 514).

Government of Malaysia, Occupational Safety and Health Act 1994 (Act 514).

May, D.N., Ph.D. (1978), Handbook of Noise Assessment.

Department of Irrigation and Drainage (2010), Guideline for Erosion and Sediment Control in Malaysia

Department of Irrigation and Drainage (2000), Urban Storm Water Management Manual for Malaysia

Department of Environment (2015), Manual Panduan Pemeriksaan BMPs untuk Kawalan Hakisan dan Sedimen.

Department of Geosains and Minerals (2017), Industrial Mineral Production Statistics and Directory of Producers in Malaysia

Department of Environment (DOE), Notice 1-2015: New Ambient Air Quality Standard, 2013

JICA, Air Quality Management Study for Kelang Valley Region, Final Report, Vol. 2, Main Report, Japan International Cupertino Agency, August 1993.

Federal Department of Town and Country Planning (2006), *Rancangan Struktur Negeri Terengganu*.

US EPA, 1995, User' Guide For the Industrial Source Complex (ISC3) Dispersion Models, U.S. Environmental Protection Agency, Office of Air and Radiation. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina 27711, USA.

*Term of Reference (TOR) of the Proposed Granite Quarry Operation on Lot PT 23066 and Lot PT 23741 With An Area of 13.4862 Hectares (33.325 Acres) In Mukim Kuala Paka, District of Dungun, Terengganu Darul Iman by Hexatrend Quarry Sdn. Bhd.*

### **Term of Reference**

Term of Reference (TOR) had been submitted to DOE Terengganu and meeting had been conducted on 30 January 2019. The TOR of the EIA study has been endorsed by the DOE as attached in **Appendix 1-7** (Ref: AS(B)T:29/012/100/088(31) dated on 18 Februari 2019). Therefore, the proposed Project falls under First Schedule, Prescribed Activity 19 according to the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015. **First Schedule, Prescribed Activity 19** is referring to **“Quarrying of Rock Material”**.

### **Input Data of Air Modeling**

No meteorological observations are available at the Project site. However, the Malaysian Meteorological Services (MMS) maintains two principal meteorological stations at Hospital Dungun and Kuala Terengganu. For the purpose of this study, meteorological observations taken at the Hospital Dungun station (Latitude N 4°45'07" and Longitude E 103°24'53"), elevation 3 m above MSL and Kuala Terengganu station (Latitude N 5°23" and Longitude E 103°6"), elevation 5.2 m above MSL can be considered as representative of the Project site.

The meteorological observations taken at the MMS meteorological station include surface winds, temperature, rainfall and relative humidity. The climate of the area is of the equatorial type, which is characterized by relatively high and uniform temperatures throughout the year, high rainfall, high humidity and light winds. The meteorology of areas under this climate regime is influenced very much by local factors such as the topography of the area, land cover and water bodies. A detail of meteorological data as attached in **Appendix A**.

Air Quality Modeling had also been carried out to evaluate the impact of quarry operation to the surrounding environment. The input data of the modeling studies are attached in **Appendix B**.

Appendix A

**METEOROLOGICAL  
DATA**

**INPUT DATA  
(AIR QUALITY  
ASSESSMENT)**

















## JABATAN METEOROLOGI MALAYSIA

**Station:** KUALA TERENGGANU  
**WMOIndex:** 48618  
**Date:** 2004 - 2015

**Latitude:** 5° 23' N  
**Longitude:** 103° 6' E  
**Elevation:** 5.2 m

Percentage frequencies of occurrence for concurrent wind direction (degrees) and speed (m/s) within specified ranges [%]								
Wind speed range								
Direction	0.3-1.5	1.6-3.3	3.4-5.4	5.5-7.9	8.0-10.7	>10.7	Total	Mean Speed
<b>Calm</b>							<b>3.2</b>	
<b>Variable</b>	0	0	0	0	0	0	<b>0</b>	
<b>N</b>	1.3	3.7	1.3	0.1	0	0	<b>6.4</b>	2.5
<b>NE</b>	1.5	9.5	6.3	0.9	0	0	<b>18.2</b>	3.2
<b>E</b>	3.8	11.2	2	0.1	0	0	<b>17.1</b>	2.3
<b>SE</b>	2.5	2	0.2	0	0	0	<b>4.8</b>	1.6
<b>S</b>	12	8.2	0.1	0	0	0	<b>20.3</b>	1.5
<b>SW</b>	13.5	8.5	0.2	0	0	0	<b>22.2</b>	1.5
<b>W</b>	3.6	1.7	0.2	0	0	0	<b>5.5</b>	1.4
<b>NW</b>	1	1	0.3	0	0	0	<b>2.4</b>	2

Variables	Summary values
Prevailing dir.	225
Mean speed	2.0
Dir. of max. gust	240
Max. gust speed	19.5
Max. gust date	28-Sep-2009
Dir. of max. speed	240
Max. speed	19.5
Max. speed date	28-Sep-2009
No. of obs. / total	105171 / 105192



## APPENDIX A – AERMOD INPUT FILES

### PM10 – WITH MITIGATING MEASURES

CO STARTING  
CO TITLEONE HEXATREND QUARRY MITI  
CO MODELOPT DFAULT URBAN CONC  
CO AVERTIME annual 24  
CO POLLUTID PM  
CO RUNORNOT run  
CO FINISHED

#### SO STARTING

\*\* SRCID SRCTYP XS YS ZS

\*\*  
-----  
SO LOCATION 1 AREA 520. 170. 0.  
SO LOCATION 2 AREA 526. 178. 0.  
SO LOCATION 3 AREA 532. 186. 0.  
SO LOCATION 4 AREA 538. 194. 0.

\*\* SRCID QS HS XINIT YINIT ANGLE

\*\*  
-----  
SO SRCPARAM 1 0.011 3.0 3. 10. 30  
SO SRCPARAM 2 0.033 3.0 3. 10. 30  
SO SRCPARAM 3 0.132 3.0 3. 10. 30  
SO SRCPARAM 4 0.003 3.0 20. 20. 30

\*\*SO EMISUNIT (GRAMS/(SEC-M\*\*2))

SO SRCGROUP ALL

SO FINISHED

#### RE STARTING

RE GRIDCART CG1 STA  
XYINC -3000. 61 100. -3000. 61 100.  
RE GRIDCART CG1 END

RE DISCCART -1100 400  
RE DISCCART -1400 -1000  
RE DISCCART -700 -1500  
RE FINISHED

#### ME STARTING

INPUTFIL KTGANU.MET (I5,3I2,F5.1,F5.1,F7.2,I2,F6.1,F7.1)  
ANEMHGHT 10.0 meters  
SURFDATA 48618 2015 KTGANU  
UAIRDATA 48618 2015 KTGANU  
STARTEND 15 1 1 15 12 31  
ME FINISHED

#### OU STARTING

OU RECTABLE ALLAVE FIRST  
OU MAXTABLE ALLAVE 50  
OU FINISHED

PM10 – WITHOUT MITIGATING MEASURES

CO STARTING  
CO TITLEONE HEXATREND QUARRY WORST  
CO MODELOPT DFAULT URBAN CONC  
CO AVERTIME annual 24  
CO POLLUTID PM  
CO RUNORNOT run  
CO FINISHED

SO STARTING

\*\* SRCID SRCTYP XS YS ZS

\*\*  
SO LOCATION 1 AREA 520. 170. 0.  
SO LOCATION 2 AREA 526. 178. 0.  
SO LOCATION 3 AREA 532. 186. 0.  
SO LOCATION 4 AREA 538. 194. 0.

\*\*

\*\* SRCID QS HS XINIT YINIT ANGLE

\*\*  
SO SRCPARAM 1 0.551 3.0 3. 10. 30  
SO SRCPARAM 2 1.653 3.0 3. 10. 30  
SO SRCPARAM 3 6.614 3.0 3. 10. 30  
SO SRCPARAM 4 0.165 3.0 20. 20. 30

\*\*SO EMISUNIT (GRAMS/(SEC-M\*\*2))

SO SRCGROUP ALL

SO FINISHED

RE STARTING

RE GRIDCART CG1 STA  
XYINC -3000. 61 100. -3000. 61 100.  
RE GRIDCART CG1 END

RE DISCCART -1100 400  
RE DISCCART -1400 -1000  
RE DISCCART -700 -1500  
RE FINISHED

ME STARTING

INPUTFIL KTGANU.MET (I5,3I2,F5.1,F5.1,F7.2,I2,F6.1,F7.1)  
ANEMHGHT 10.0 meters  
SURFDATA 48618 2015 KTGANU  
UAIRDATA 48618 2015 KTGANU  
STARTEND 15 1 1 15 12 31

ME FINISHED

OU STARTING

OU RECTABLE ALLAVE FIRST  
OU MAXTABLE ALLAVE 50  
OU FINISHED