

EXECUTIVE SUMMARY

Environmental Impact Assessment (2nd Schedule)

Proposed Iron Ore Mining Operation on Lot 112997 With an Area of 80.94 Hectares (200.0 Acres) in Mukim Jerangau, District of Dungun, Terengganu Darul Iman

Project Proponent:

ME Rock Sdn Bhd

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EIA Consultant:



O&E Technologies Sdn Bhd

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Tropical Growth (M) Sdn Bhd

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Wakaf Che Yeh, 15100 Kota Bharu, Kelantan.
Tel: 018-5964763 Fax: -
Email: tropicalgrowth@gmail.com

INTRODUCTION

PROJECT LOCATION

- Lot 112997 in part of Besul Forest Reserve area and locality of Bukit Besi, Mukim Jerangau, District of Dungun, Terengganu Darul Iman.
- Located approximately 8 km from Bukit Besi Township

PRESCRIBED ACTIVITY

- The prescribed activity pertaining to the Project is: **"Activity 8 (b) – Mining of minerals within or adjacent or near to environmentally sensitive area"**

PROJECT DESCRIPTION

- Total area: 80.94 Hectares (200.0 Acres)
- Project owned: Lembaga Tabung Amanah Warisan Negeri Terengganu

PROJECT ACCESSIBILITY

- Project site can be accessed from the main road, Jalan Tepus-Kg Kuala Jengai continue with existing logging track approximately in 4 km

STATEMENT OF NEEDS



Increased Demand

To generate income and to fulfill the demand in mining processing industry



Advanced Technology

Utilization of advanced iron mining processing technology to reduce environmental impact



Economic Growth

In 2013, Malaysia exported a total of 12,429,184 tonnes (RM1.44 billion) of high-grade iron ore mainly to China and followed by Indonesia, Hong Kong, Singapore and Brazil. In Terengganu, the production of iron ore is about 939,197 tonnes from 13 operating mines.



Employment

The Project is expected to produce job opportunities to nearby community



Local Planning Strategy

Thrust 1: Expansion of Mineral Sector of the

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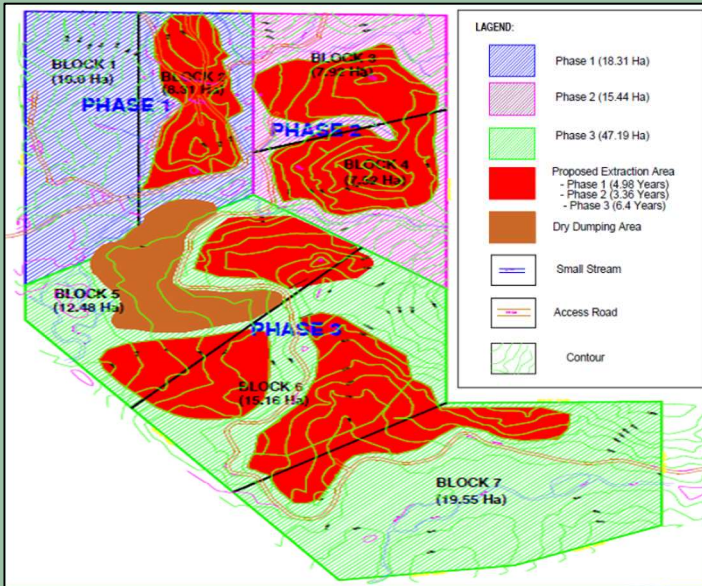
PROJECT CONCEPT



The proposed mining site is active iron ore potential zone with iron ore grade of 59.1-60.8% Fe content.



Project area will be divided into 3 phases (7 block area)



Phase	Block	Area (Hectare)	Estimated Iron Ore reserve (Tons)	Operation Mining Life (years)
1	1 & 2	18.31	608,384	4.98
2	3 & 4	15.44	400,176	3.36
3	5, 6 & 7	47.19	790,776	6.4
Total		80.94	1,799,336	14.7 ≈ 15

Table 1: Reserve Estimation

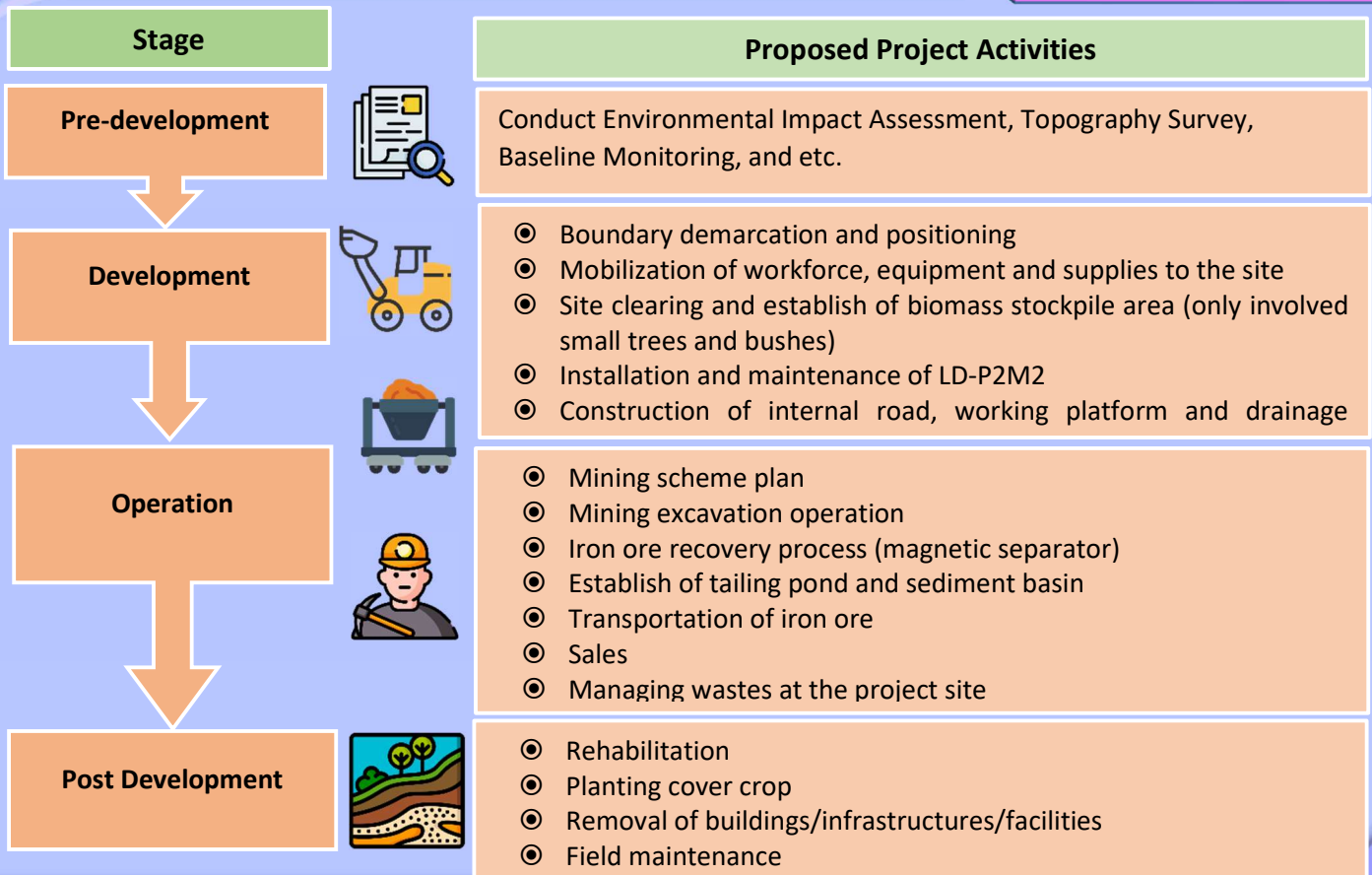
REGIONAL SETTING

RTD Dungun 2035: BPK 9.2- Mukim Jerangau

Landuse zoning: Forest

RSN 2050: Project located within ESA Rank 1 – No development, agriculture or logging shall be permitted except for low-impact nature tourism, research and education.

PROJECT ACTIVITY



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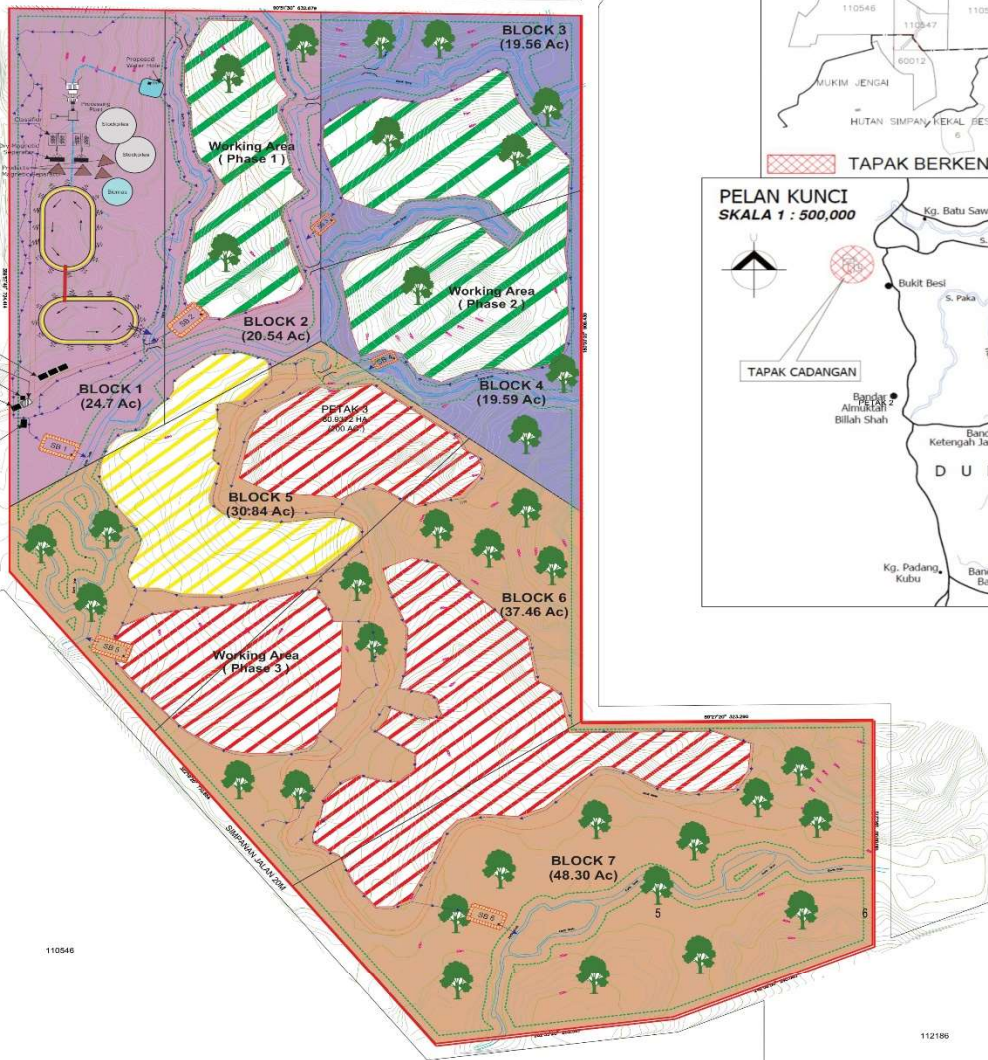
PROJECT ACTIVITY

Mining Scheme Plan

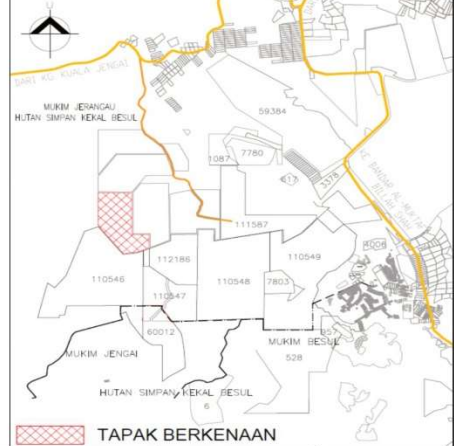
N
 MUKIM JERANGAU
 DISTRICT OF DUNGUN
 TERENGGANU DARUL IMAN
 TOPO NO. : 4363
 SCALE 1 : 2,700

HUTAN SIMPAN
 BESUL TAMBAHAN

PETA 4



PELAN LOKASI
 SKALA 1 : 100,000



PELAN KUNCI
 SKALA 1 : 500,000



CONSULTANT SEAL AND SIGNATURE:

PROPOSER SEAL AND SIGNATURE:

LEGEND

	AREA SITE (80.9372 HA (200 AC))		WATER DIRECTION
	PHASE 1 (45.24 Ac)		CONTOUR LINE
	PHASE 2 (38.15 Ac)		WATER PUMP
	PHASE 3 (116.6 Ac)		PROPOSED SPILLWAY
	PROPOSED EXTRACTION AREA		BUFFER ZONE 10M
	PROPOSED DRY DUMPING AREA		GREEN AREA
	ACCESS ROAD		PROGRESSIVE REHAB (Back-filling & Re-vegetation)
	SMALLSTREAM		SEDIMENT BASIN
	PROPOSED TAILING POND		

APPENDIX 2 (c)

PLAN TITLE			
PROPOSED MINING SCHEME PLAN			
PROPOSER			
ME ROCK SDN BHD			
Drawn by	Wan Aidil	Date	05.10.2021
Checked by	Ir. Hj. Anuar	Date	06.10.2021
Approved by	Ir. Hj. Anuar	Date	06.10.2021
Plan No.: MRSB-AMEC-10/2021			

AMEC ENVIRONMENTAL CONSULTANT
 31A/01, Jalan Pagar Tambun, Tambun
 31400, Ipoh, Perak Darul Ridzuan
 Tel: 05 5452871, Fax: 05 5462870
 Email: amec_anuar@yahoo.com

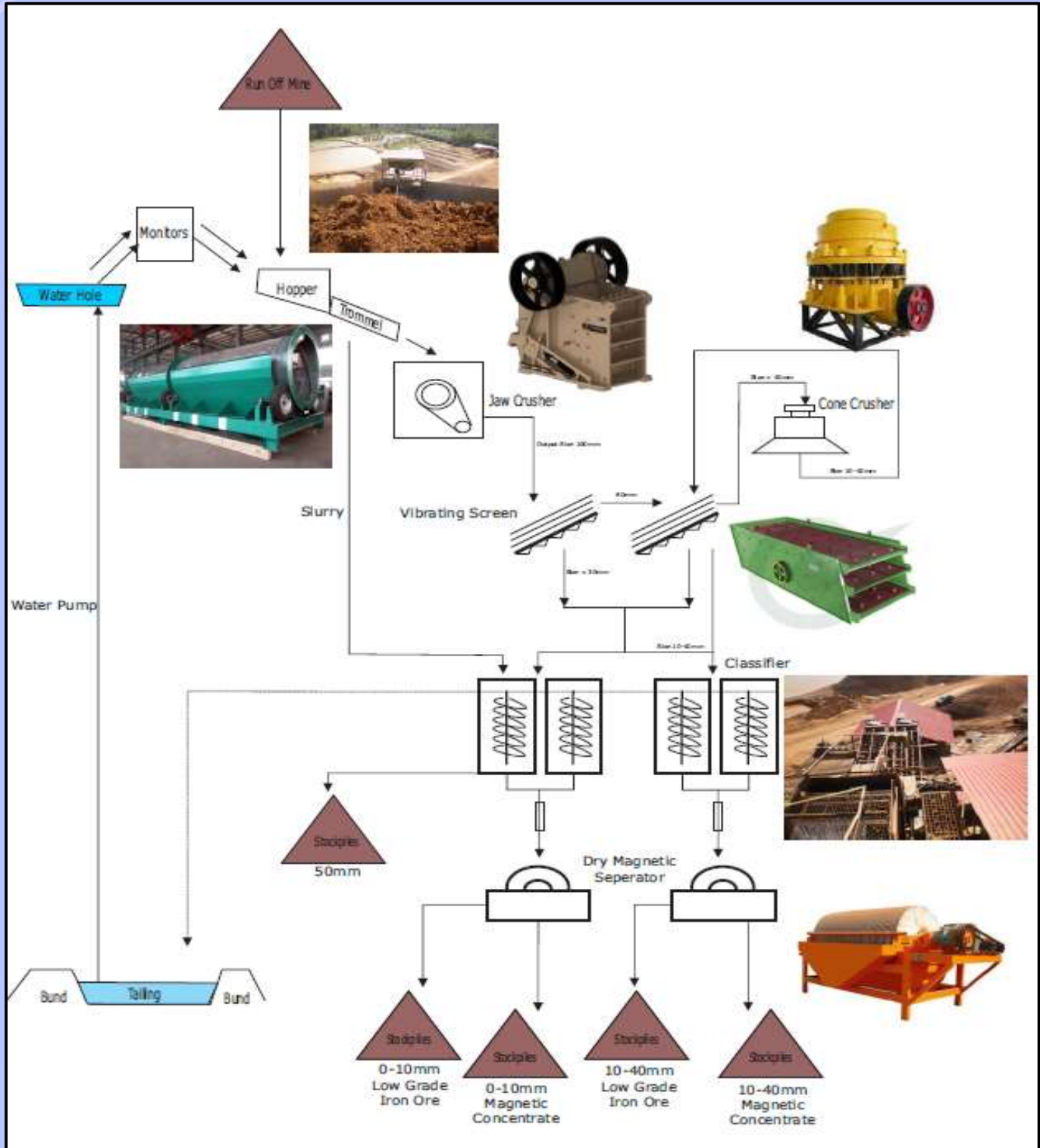
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PROJECT ACTIVITY

Diagram of Iron Ore Mining Process (10,000 ton/month)



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01

TOPOGRAPHY

Moderate to hilly terrain
Elevation: 40m -138m



02

GEOLOGY & SOIL

Metamorphic rock: Carboniferous-Phyllite
Soil: Silty Sand and soil series Kuala Berang-Kedah-Serdang



03

FLOOD RISK

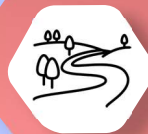
Flood map DID (2000) – Site **not** located within flood prone area



04

LANDUSE

Residential:	Kg. Tersusun Rantau Panjang (3-4km), Kg. Minda (3-4km)
Agriculture:	Rubber Plantation (3-4km) and (4-5km)
River :	Sg. Cemuak (1-2km) and Sg. Dungun (2-3km)
Forest :	Besul (Tambahan) Forest Reserve (2-3km) Jerangau Forest Reserve (3-5km)
Industrial :	TBM Minerals Sdn Bhd ML4/2019 and Geomagai Sdn Bhd (2-3km), Cahaya Ikhtiar Sdn Bhd and Fortress Mining Sdn Bhd (3-4km),



05

HYDROLOGY

Catchment: Dungun River Basin
Water intake: LRA Tepus (21km), LRA Kemudi (47.5km) and LRA Serdang (50.5km)



06

TRAFFIC

Accessible road to Project site:
Jalan Tepus-Kg Kuala Jengai
Entering to logging track 4km to proposed project site
Access point GPS: 4°46'3.87N and 103°6'53.77"E

EXISTING ENVIRONMENT



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07

SOCIO-ECONOMIC

Department of Statistic Malaysia: Population at Mukim Jerangau – 400
Social economy of nearby community: plantation, mining activity and agriculture activity



08

GROUNDWATER

There is no existing use of groundwater at surrounding the Project site
Main source of water – Syarikat Air Terengganu.



09

ECOLOGY

Forest Reserve categorized ESA Rank 1 are found nearest project site – Jerangau and Besul. So ecological interesting flora and fauna area expecting to be found within the Project site.

EXISTING ENVIRONMENT



10

ENVIRONMENTAL BASELINE INVESTIGATION

Water quality:	Thirteen (13) surface water sampling for 34 parameters All samples collected were classified as Class II (Clean) except for point WQ6 and WQ7 was categorized Class II (Slightly Polluted) based on WQI, NWQS.
Air Quality:	Three (3) point location sampling for parameter air -PM2.5, PM10, CO, NO ₂ and NO ₃ All readings were below than the stipulated standards.
Noise:	Three (3) point location sampling for parameter LAeq, LAmin, LAmax, L90 and L10 All points noise level recorded complied the maximum permissible Sound Level, Annex A, Schedule 1.
Groundwater:	Two (2) point groundwater sampling was conducted within the Project site and residential area. The results were compared with Standard Kualiti Air Tanah Kebangsaan, DOE 2019.
Aquatic Ecology	Five (5) sampling location of aquatic study was conducted for six (6) heavy metal parameter



CENTRAL FOREST SPINE (CFS)



Department of Forestry Terengganu, the project site is located within the central forest spine corridor (SL4): Taman Negara Forest Complex-Terengganu Coast

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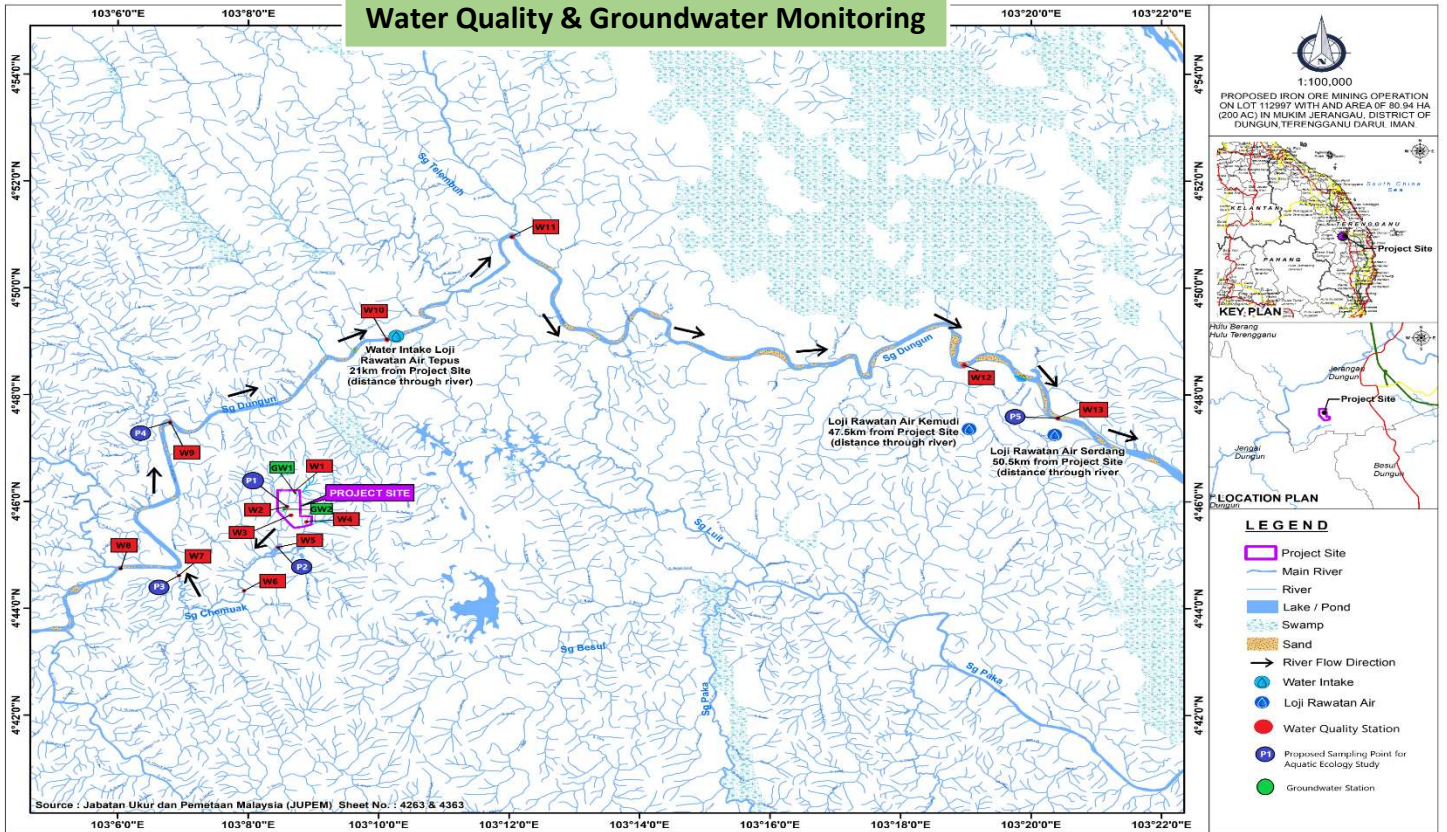
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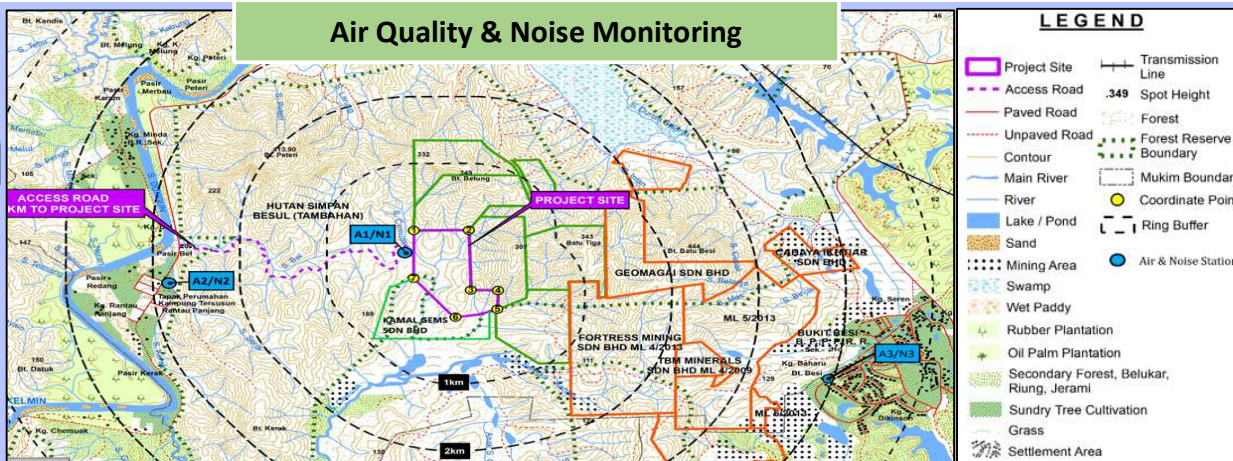
POINT LOCATION FOR BASELINE & ENVIRONMENTAL MONITORING



Water Quality & Groundwater Monitoring



Air Quality & Noise Monitoring



STANDARD GUIDELINE FOR ENVIRONMENTAL MONITORING

Water quality:	National Water Quality Standards (NWQS) and Mineral Effluent, JMG 2016
Air Quality:	Malaysian Ambient Air Quality Standard 2020 (NMAAQS)
Noise:	Guidelines for Environmental Noise Limits and Control, Third Edition, 2019 Reprint 2021
Groundwater:	Standard Kualiti Air Tanah Kebangsaan Malaysia, 2019, DOE and MOH standard

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IMPACT ASSESSMENT

DEVELOPMENT STAGE

OPERATION STAGE

01

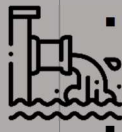
SOIL EROSION & SEDIMENTATION

Land disturbance and erosion caused by the land clearing and platform level



Erosion and possibility of slope failure due to the excavation of raw materials (mining), which further may cause impact of sedimentation to downstream areas.

- Water pollution of water quality in nearby water bodies due to discharge of potential contaminated surface runoff
- High turbidity in nearby water bodies due to the increased of suspended solids caused by land clearing activities.



WATER QUALITY

Possible mine effluent water discharge overflow into the nearby river during monsoon season.

Increase of total suspended solids (TSS) levels and sedimentation in nearby water bodies due to the surface runoff from the exposed land and stockpile area within the Project site

02

03

HYDROLOGY

- Causing changes in the water flow
- Worst case scenario, potential flood incident might happen due to the overflow of used mining pond especially during monsoon season.



Worst case scenario, potential flood incident might happen due to the overflow of mining pond especially during monsoon season.

- Exhaust emissions and dust generation from the construction vehicles movement within the proposed Project.
- Dust generation caused by the clearing and construction activities



AIR QUALITY

- Exhaust emissions and dust generation from the construction vehicles movement within the proposed Project.
- Exhaust emissions from the machineries and equipment used for mining operation.

04

05

NOISE QUALITY

Noise level generated from machinery and construction vehicles movement within the project site.



Moderate noise level generated from mining operation activities such as heavy machinery operation and heavy vehicles movement during transportation of mining products.

- Generation of biomass waste during the site clearing activities.
- Generation of sewage, sullage and garbage from the workers.
- Minor generation of scheduled waste (SW305, SW306, SW409 and SW410) from earthwork activities



WASTE GENERATION

- Garbage and scraps generated from the operation.
- Generation of sewage, sullage and garbage from the operation area.
- Minor generation of scheduled waste (used oil) from workshop and working areas.

06

NEXT TO
CONTINUES

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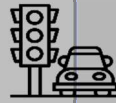
IMPACT ASSESSMENT

DEVELOPMENT STAGE

OPERATION STAGE

07 TRAFFIC CONGESTION

Safety issue/concern and dust generation during the transportation of construction



Safety issue/concern and dust generation during the transportation of mining products.

- Promote economic growth and create job opportunities.
- Pose noise pollution to public due to machineries and lorries.
- Risk of road safety due to the increase of traffic volume.



08 SOCIO-ECONOMIC

- Promote economic growth and create job opportunities.
- Pose noise pollution to public due to machineries and lorries

09 HEALTH & SAFETY

- Risk of occupational safety when handling machineries.
- Air pollution and elevated noise level have impact on workers but minimal impact on community
- Biological hazards such as dengue may become an issue if no proper care



- Improper handling of heavy machineries and operation's equipment might cause injury to the workers.
- Dumping mound may pose safety hazard to workers if landslide occur.
- Biological hazards such as dengue may become an issue if no proper care at project site

- Potential loss of habitat and population of flora and fauna due to clearance and development of the Project.



10 BIOLOGICAL (FLORA & FAUNA)

- Mining pond may pose drowning incident and hazard to wildlife
- Human-wildlife conflict and food shortage

ABANDONMENT STAGE

Soil Erosion	Erosion and possibility of slope failure due to the filled and levelled of excavated area and used mining pond during rehabilitation work.
Water Quality	<ul style="list-style-type: none"> • Potential soil loss and sedimentation in water bodies • Possible formation of acid mine drainage (AMD), which could contaminate the nearby received water bodies
Air Quality	Dust generation caused by exposed bare land that not be used.
Health and Safety	Used mining pond may pose hazard place to the public and wildlife especially the drowning incident.

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MITIGATION MEASURES



SOIL EROSION

Development Stage

- Land Disturbing Pollution Prevention and Mitigation Measure (LD-P2M2) description and drawings based on various phases of development.
- A schematic layout plan of the project was provided after mining activities, outlining the location of overburden filling, pond formation, slope formation, final platform level, etc.
- All proposed BMPs component such as sediment basin, silt fences, earth drain and etc. should be installed first in designated area before commencement of construction activities.
- Implementation of slope and stockpile protection.

Operation Stage

- Provide proper drainage system to transport the silt with discharge from mining plant operation into the tailing pond.
- Slope maintenance shall regularly be done and slope failure shall be repaired to avoid further failure. All slope should be turfing

Abandonment Stage

- Rehabilitation plan for each phase project.
- Replanting of tree for disturbed area



WATER QUALITY

Development & Operation Stage

- Stockpile of construction/biomass, skid tanks and any fuel storage will be located away from the river.
- Periodical maintenance and desludging of these portable toilets will be conducted.
- Proper on-site management from oil and grease material entering the water way
- Regular water quality monitoring and riparian monitoring program.
- Ensure all discharges from the mining site will be treated and flow to the tailing pond/sediment pond and ensure no water discharged out of the Project site.
- Testing of chemical composition of the receiving water is free from sulphate mineral in contributing to the forming acid mine drainage.
- Deploying phytoremediation at tailing ponds



HYDROLOGY

Development Stage

- Implementation of LD-P2M2 is a must
- During land clearing work, clear mapping of the stream and tributaries in the basin is compulsory to ensure the existence of the stream was not interrupted

Operation Stage

- Volume discharge need to be monitored and stabilized from time to time
- Make sure the breakup/excavate is not too deep or does not exceed the depth of the groundwater level.



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MITIGATION MEASURES

TRAFFIC MANAGEMENT

Development & Operation Stage

- Use alternative routes, avoid peak hour and limit speed of site vehicles.
- Enforce safety measures, signpost warnings, and use barricades.



HEALTH & SAFETY

Development & Operation Stage

- Construction site must be registered for any engineering work of site such as HIRARC.
- Proper safety signage should be posted at the entrances of the construction site to warn the public.
- Provide good facilities that related to emergency such as emergency plan, first aid kit, fire extinguisher and telecommunication facilities.
- Provide efficient sanitary and disposal system for unconsumed foods to prevent breeding ground for pests.
- Workers shall be provided suitable PPE and got vaccinated against vaccine-preventable diseases such as COVID-19, Hepatitis B and influenza

Abandonment Stage

- Proper decommissioning and removal of all structures, equipment and machineries that used during mining operation



SOCIO-ECONOMIC

Development & Operation Stage

- Maximize the use of local labour as operator the mining plant.
- Control the traffic and other possible risk for public safety purpose



BIOLOGICAL ENVIRONMENT

Development Stage

- Preserving 10-metre reserve buffer zone along boundary and each bank (left and right of Sungai Cemuak)
- Sign posting and strict control on fire-zero burning.
- Clearing at the site heading towards Besul Forest Reserve to best enable fauna escape and site clearing shall be limited to the areas dedicated for the mining activities, tailing plant, and related facilities only (by phase).
- Reserved buffer zone for any waterbodies in-site the Project area.
- Human-wildlife conflicts management if any.
- Development of fencing at the boundary of the project site.
- Wildlife and fauna management-monitoring, rescue and relocation.
- Sign posting and preventing wildlife related offences.
- Sign posting roadkill prevention alert

Operation Stage

- Development of fencing at the boundary of the project site.
- Taking into account on human-wildlife conflicts.



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MITIGATION MEASURES

AIR QUALITY

Development & Operation Stage

- All vehicles wheels should be cleaned prior to exit the site mining to minimize dust generated during vehicle movement.
- Frequent spraying of water of access road and internal roads within the project site particularly during dry and windy weather.
- Maintain equipment, machinery and construction vehicles to reduce their emissions of smoke.
- Open burning of construction & operation debris is strictly prohibited.



NOISE QUALITY

Development & Operation Stage

- Suitable noise absorbent materials should be installed on machinery that produces high noise levels.
- Machinery emitting high noise shall be sitted within an enclosure to reduce noise pollution and silencer to be fitted to noisy equipment when necessary.
- Working hours for high noise emitting activities will be limited to day time only. (7.00 am to 7.00 pm)
- Screening of the mining area with landscaping helps to reduce noise generation and dust exposure.



WASTE MANAGEMENT

Development & Operation Stage

A. Construction and Domestic Waste

- Provide garbage bins on site.
- Separate waste types and implement recycling campaign.
- Discharges wastes directly into the water courses and open burning are prohibited.
- Disposed at a municipal approved landfill or dumping site.

B. Scheduled Waste

- Storage and handling of scheduled wastes should be carried out according to the Environmental Quality (Scheduled Wastes) Regulations, 2005, such as:
- The wastes should be stored in sealed drums, labelled and placed in a proposed scheduled wastes storage shed
- The shed should be concrete paved, bunded with a capacity to contain 110% of the largest container volume
- There should not be any opening in the bund wall that may allow leakages and spills to flow off-site
- Scheduled wastes should not be kept on site for more than 180 days or exceed 20 tonnes.

Abandonment Stage

- All the wastes shall be transported out from the site area.

