Nilaimas Services

ENVIRONMETAL IMPACT ASSESSMENT FOR "PROPOSED IRON ORE MINING AT ML20/2021 WITH AN AREA OF 210.0 HECTARES, HUTAN SIMPAN SOKORTAKU, MUKIM SOKOR, DAERAH ULU KUSIAL, JAJAHAN TANAH MERAH. KELANTAN DARUL NAIM"

EXECUTIVE SUMMARY

MINING LEASEHOLDER

Sungei Hijau Sdn Bhd (797245-U)
Tingkat 1, 4262-B, Jalan Kebun Sultan,
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Contact Person : Mohd Jafri Bin Ismail
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09 – 7484148 (Office)
Email : sungei.hijau@gmail.com

MINING OPERATOR

Jana Gold Sdn Bhd (796130-U)
No. 548, Tingkat 1, Jalan Hospital, 15200
Kota Bharu, Kelantan
Contact Person : Mr. Kim Chui Seng @
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EIA CONSULTANT

Nilaimas Services (001953513-D)
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Taman Equine, 43300 Seri Kembangan,
Selangor Darul Ehsan.
Tel: 03-8940 9959, Fax: 03-8940 9958
Qualified Person: Dato' Seri Hj Mohd
Nawahidudin Bin Mahamad Isa DOE
Registration No: CEP 0270

PROJECT OVERVIEW

PROJECT LOCATION

ML20/2021 located at Hutan Simpan Sokortaku, Daerah Ulu Kusial, Jajahan Tanah Merah, Kelantan

LEGAL REQUIREMNET

Schedule 2: Activity 8 (b); Mining of Minerals within or adjacent or near to environmentally sensitive area.

Mining Lease Duration
Total area: 210.0 Ha
5 years start 17th October 2021

Mine Life
Operational Life: 20.4 years

Zoning

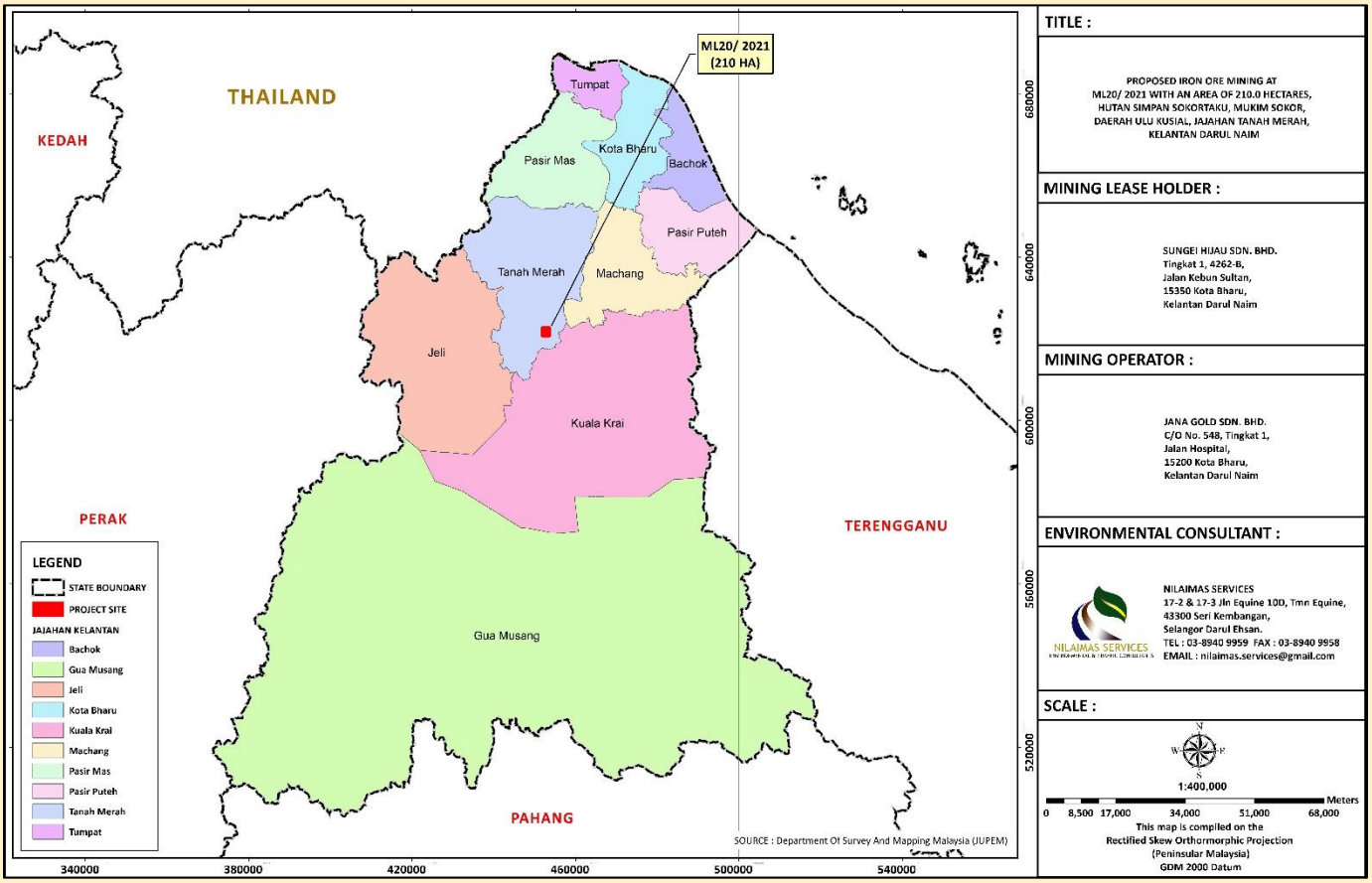
Based on RTJ Tanah Merah 2020 site is located within Land use zone Hutan and Mining activities are permitted subject to permission obtained from the State Government and relevant authorities

PHASING	Proposed Working Area:	Phase 1 (70.83 Ha)	Phase 2 (73.50 Ha)	Phase 3 (25.30 Ha)

STATEMENT OF NEED

- DEMAND AND SUPPLY
- FULFILLS THE LOCAL COMMUNITY NEEDS
- COMPATIBILITY WITH LOCAL PLANNING STRATEGIES

KEY, LOCATION AND SITE PLAN



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MINING OPERATOR :

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Jalan Hospital,
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Kelantan Darul Naim

ENVIRONMENTAL CONSULTANT :

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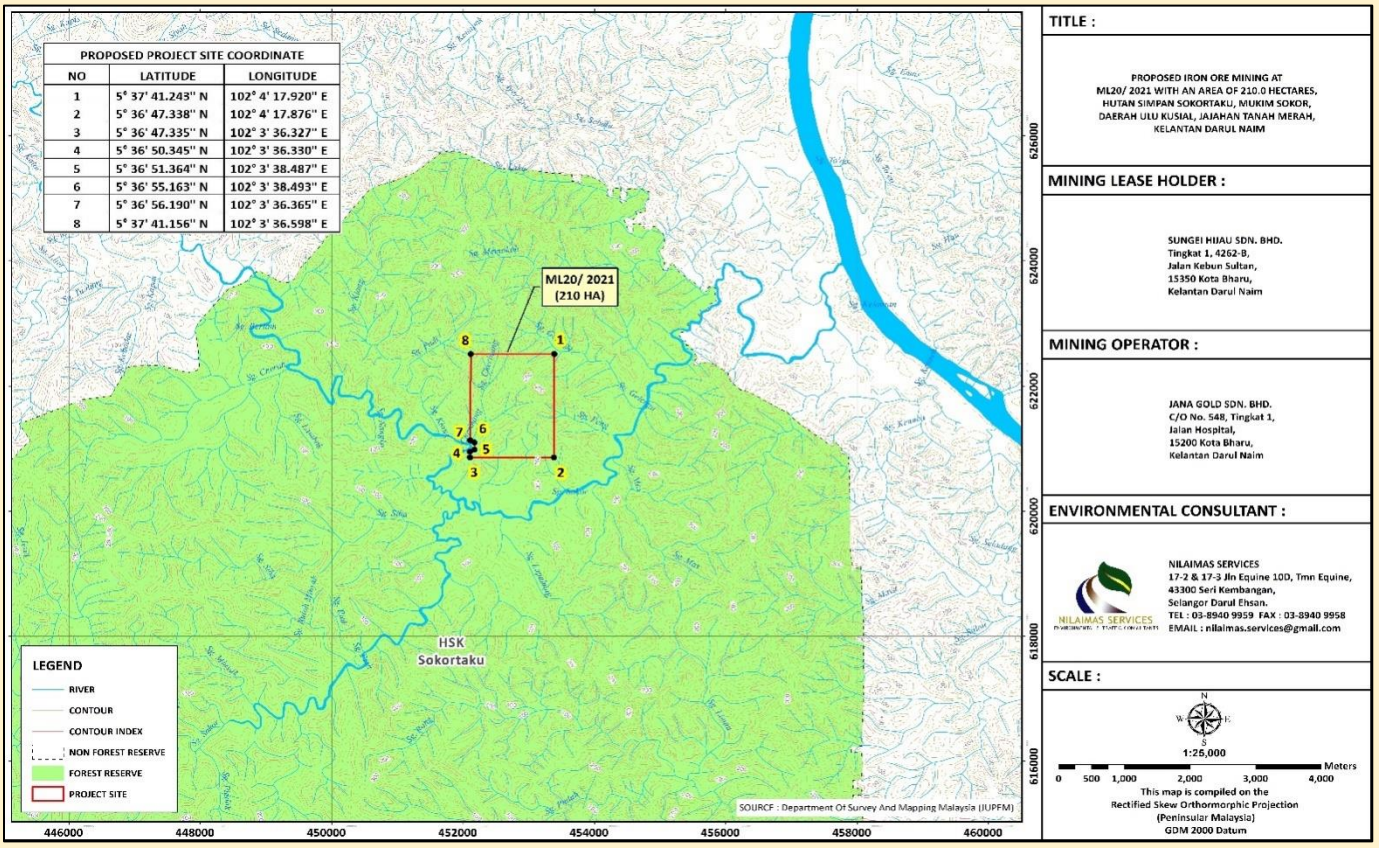
Selangor Darul Ehsan.
TEL : 03-8940 9959 FAX : 03-8940 9958
EMAIL : nilaimas.services@gmail.com

SCALE :

1:400,000

0 8,500 17,000 34,000 51,000 68,000 Meters

This map is compiled on the
Rectified Skew Orthormorphic Projection
(Peninsular Malaysia)
GDM 2000 Datum



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SCALE :

1:25,000

0 500 1,000 2,000 3,000 4,000 Meters

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EXECUTIVE SUMMARY

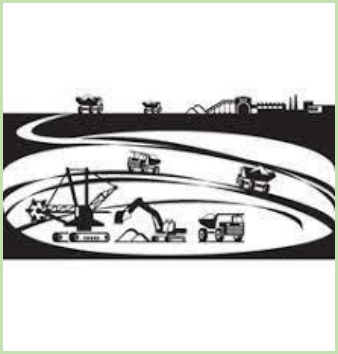
PROJECT CONCEPT

Open-cast Mining (Dry) → Internal Ore Haulage → Ore Processing (Wet)

Purpose	Estimated Utilization Area (Ha)
Mine Excavation Area	145.0
Mineral Processing Plant	1.5
Tailing Storage Facility	3.5
Product Stockpiles	1.0
Overburden Stockpiles	10.0
Mine Office	0.5
Access/Haul Road	2.5
ESCP BMPs	2.0
Workshop	0.5
Buffer Zone	6.5
Future Development	37.0
Total	210.0

Iron Ore Reserves and Mine Operational Life

Estimated Workable Deposit Area	Iron Ore Reserve	Operational Mine Life
126 Ha	4,795,875 tonnes	20.4 years



- ✓ The mining operation has been designed to operate at a maximum of about 45,000 m3 per month inclusive of overburden stripping
- ✓ Designed ROM throughput of about 11,250 m3 per month comprise of about 70% dry process and 30% wet process
- ✓ Transporting excavated overburden to dry-dump area for temporary stockpiling and re-use in reclaimation
- ✓ Tailing pond maintenance and monitoring
- ✓ Reclaimation of completed mine sites will run concurrently to ore excavation
- ✓ Drying and stockpiling of product

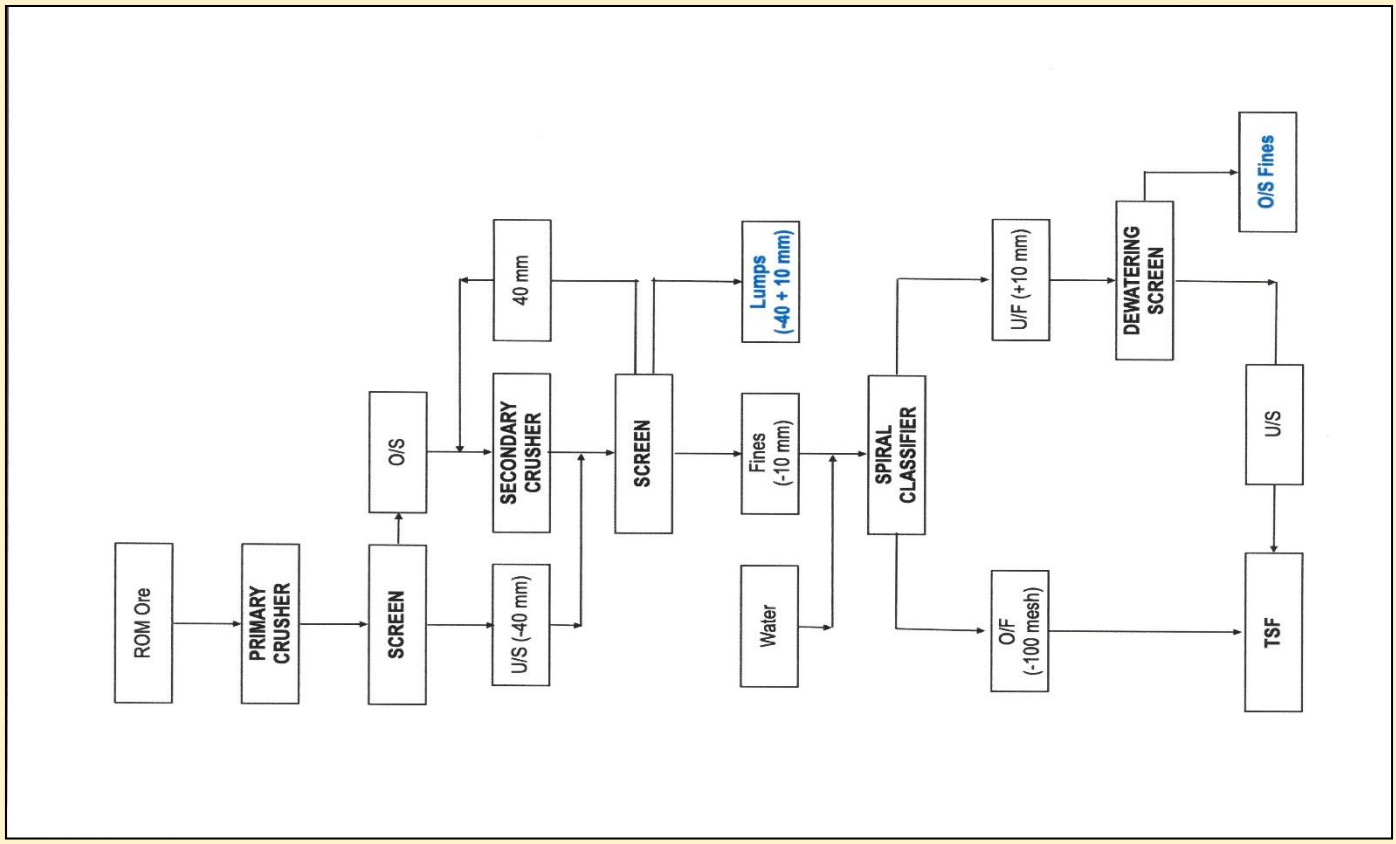
Tailing Pond Water Recycling

- ❖ Closed circuit water recirculation
- ❖ There will be no effluent discharge
- ❖ Desilting of the ponds will be carried out periodically to restore the tailing pond retention capacity

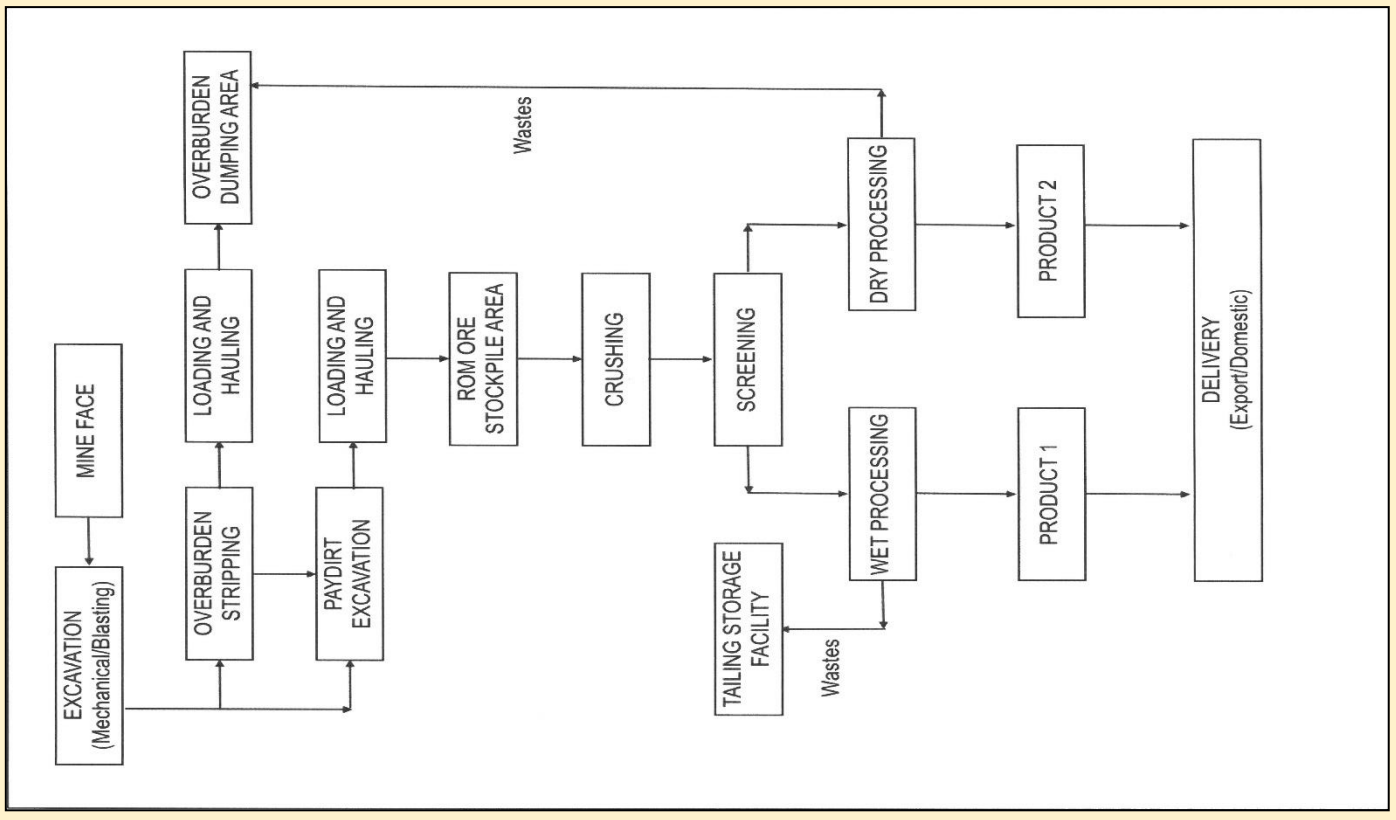
Production Capacity

- ➢ Average annual production of about 101,500 tonnes to 216,533 for the first 5 years
- ➢ Expected to increase to about 274,050 tonnes per year when the mine is fully operational schedule in its 6th year of operation

FLOWCHART



Iron Ore Processing using dry and wet processing method



Proposed Mining Operation

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EXECUTIVE SUMMARY

PROJECT ACTIVITIES

Investigation Stage

- Exploration of mineral deposit
- Environmental Impact Assessment

Initial Site Preparation and Construction Stage

i. Boundary demarcation and positioning;
ii. Mobilization of the workforce;
iii. Transport of equipment and supplies;
iv. Land Preparation;
v. Overburden removal;
vi. Construction of Haulage Road and Working Platform;
vii. Construction of Drainage System;
viii. Installation of Iron ore Processing Plant and other Construction of Buildings;
ix. Construction of Tailing Ponds;
x. Constructions of Erosion Control BMPs;
xi. Managing waste at the Project site; and
xii. Creation of buffer zone.

Operational Stage

- Excavation of ores
- Stockpiling overburden at dry dump
- Haulage of ROM to the processing plant
- ROM Processing
- Tailing pond maintenance and monitoring
- Maintenance of haulage and access road
- Management of haulage and access road
- Management of BMPs
- Concurrent reclamation of mine sites
- Transportation of end products

Abandonment and Rehabilitation Stage

- Plan for mine closure
- Decommissioning
- Reclamation and backfilling
- Rehabilitation

EXISTING ENVIRONMENT

LANDUSE

- According to Rancangan Jajahan Tanah Merah 2020, Project Site is Located inside Hutan Simpan Sokor Taku.
- Existing lan use gazette as forestry whereby mining activities are permitted subject to permission granted from the state government and relevant authorities.
- The existing land use of the Project Site is mainly secondary forest.

TOPOGRAPHY

- The terrain in the locality is generally undulating to gentle to steep slope with contour lines from 22.28m to 222.03m
- Slope of class I and ii : 30.10%
- Slope of class iii : 51.1%
- Slope of class iv : 18.10%
- Slope of class v : 0.80%

CLIMATE AND METEOROLOGY

- Mean monthly relative humidity ranges from 82.8 % to 98.8 %
- Monthly mean temperature ranges from 28.8 % to 37.1 %
- The wind is calm with mean speed of 0.8 m/s
- The range of annual rainfall amount from 2013 to 2022 was between 2212.1 mm to 3457.4 mm
- The highest monthly rainfall was recorded in January 2017 with value 916.2 mm/month

SURFACE HYDROLOGY

- Proposed development area lies within Sg. Kelantan river basin
- Drains toward a small river within site and merge with another river before discahraging toward Sg. Sokor.
- Three (3) water intake located nearest to project site which are Peralla Water Intake (4.75 km), Kuala Tiga Water Intake (7.50 km) and Bukit Remah Water Intake (19.86 km).
- Two (2) Air Tandak located upstream to project site which are GFS Sokor (1.23 km) and GFS Batang Gedik (7.94 km)

SITE GEOLOGY

- The geology of the proposed mining site is comprised of schist, phyllite and shale.
- Schist is dominant rock lithology and is called Taku Schist rock formation, named after Sungai Taku in central east Kelantan.

SOIL CHARACTERISTIC

- The soil materials observed were recorded as gravelly sand, sandy silt and silty sand.
- Gravelly material found in the bore log indicated the fragments of quartz veins and lenses as normally discovered on the surface outcrop.

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EXECUTIVE SUMMARY

EXISTING ENVIRONMENT

ENVIRONMENTAL QUALITY

WATER QUALITY

. Twenty-six (26) sampling points

. Water Quality Index (WQI) for most sampling points classify as Class II except point W20, W21, W22, W24, W25 and W26

. Baseline river water status for all sampling points are considered as clean and slightly polluted.

NOISE LEVEL

. One (1) sampling point

. Daytime period level: 58.02 dB(A)

Nighttime period level: 43.47 dB(A)

. Noise Level were below the limit under schedule 1 (Sub Urban) of 60 dB(A) for daytime and 55 dB(A) for nighttime

AIR QUALITY

. One (1) sampling point

. The sampling was done from 27th to 28th January 2022

. SO2, O3, CO are not detected

. PM10, PM2.5 and NO2 are within the permissible limit as per Malaysia Ambient Air Quality Standards (Standard value by 2020) (MAAQS)

GROUNDWATER QUALITY

. Five (5) monitoring stations

. Two groundwater samples were classified as Good with the GWQI index of 72.83 (BH3A) and 88.97 (BH5A). Other three groundwater samples were categorised as Excellent with the GWQI index values of more than 90.

TERRESTRIAL FAUNA

- Methodology
  - Camera Trapping - 8 location in Project Area based on the designated stratified random sampling design
  - Transect Line Survey - Identification of bird species visually or aurally by recognition of unique songs and calls. Record any notable behaviours of the bird such as feeding, nesting, or breeding
- Faunal Composition
  - Mammals
    - Survey conducted has recorded 15 species of mammals from 10 families
      - 7 Protected species (Schedule 1)
      - 4 Totally Protected species (Schedule 2) as listed in Wildlife Conservation Act 2010
      - 4 species were not listed under the WCA 2010 (Act 716).
  - Avifauna
    - A total of 100 species from 40 families of birds were recorded
      - 77 bird species were listed as totally protected
      - 11 species are protected under the Wildlife Conservation Act 2010 [Act 716]
      - 12 bird species were not listed under the act
  - Herpetofauna
    - A total of 27 species of herpetofauna were recorded
      - 12 Protected species (Schedule 1)

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EXECUTIVE SUMMARY

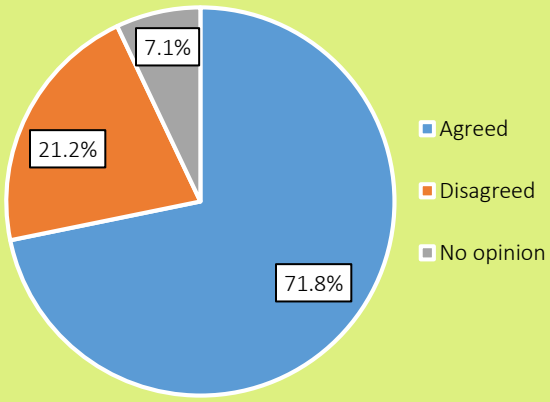
EXISTING ENVIRONMENT

TERESSTRIAL FLORA

- Methodology
  - Qualitative Transects Line Survey method - to determine the flora diversity.
    - The transects line were located along the accessible forest trails and abandoned logging tracks
    - The direct observation was conducted and all existing plants encountered visually were listed
    - Observed plants were recorded, identified and photographed using observation kits (binoculars, camera with tele-photo lens).
- Floristic Composition
  - A total of 126 species derived from 54 families
    - The family Euphorbiaceae and Rubiaceae are the largest families with the both families represented by 11 and 9 species respectively

SOSIO-ECONOMIC

Respondent's Acceptance toward Proposed Project



Total Respondent: 156

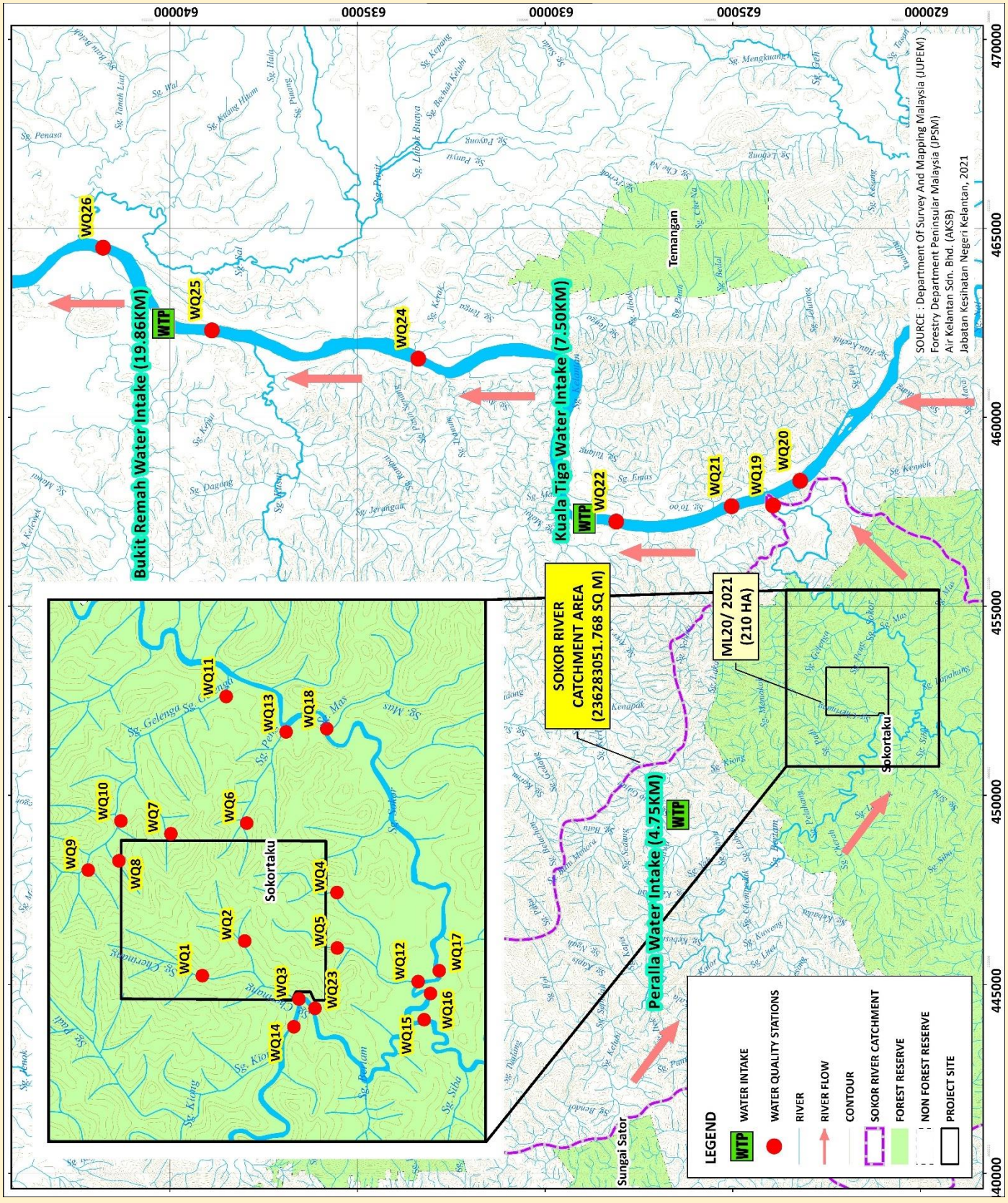
- Kampung Sokor
- Perumahan Ladang Sokor
- Kampung Peralla

- Majority with 112 respondents (71.8%) **agreed** toward the proposed Project as they believed the Project will create jobs for the locals
- 33 respondents (21.2%) **disagreed** regarding the proposed Project as the Project will be held in Sokortaku Reserved Forest which may disturb the nature of the reserved forest which may cause degradation of river quality

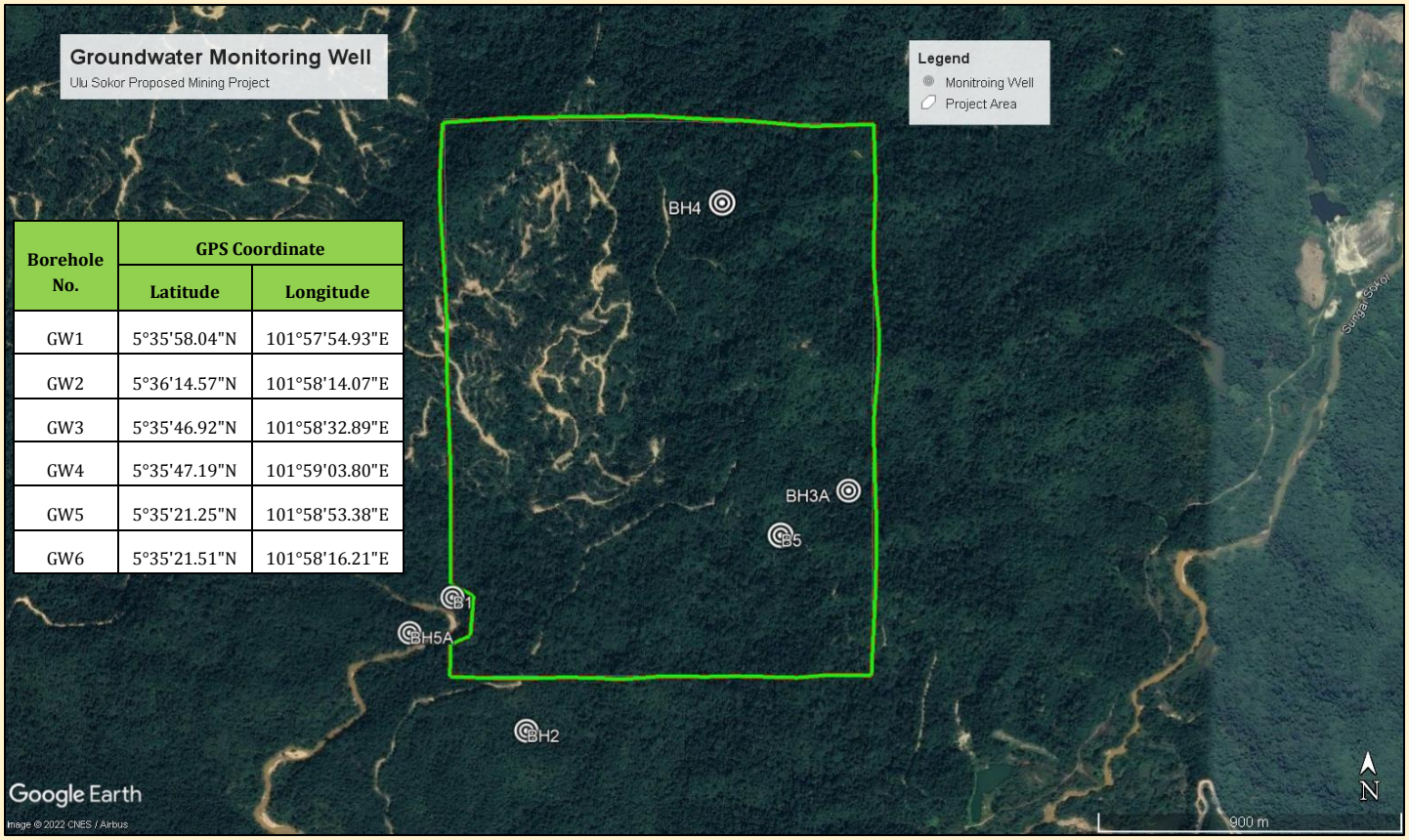
COMMUNITY HEALTH

- 10.2% (n=69) of the heads of the households and their dependents are diagnosed by a doctor as not healthy and had one or more problems in the past six months
- The commonest health issue is hypertension (5.4%) followed by diabetes mellitus (4.7%), gout (1.9%), arthritis (1.6%) and asthma (1.3%).
- These diseases are most probably related to poor diets and air quality.

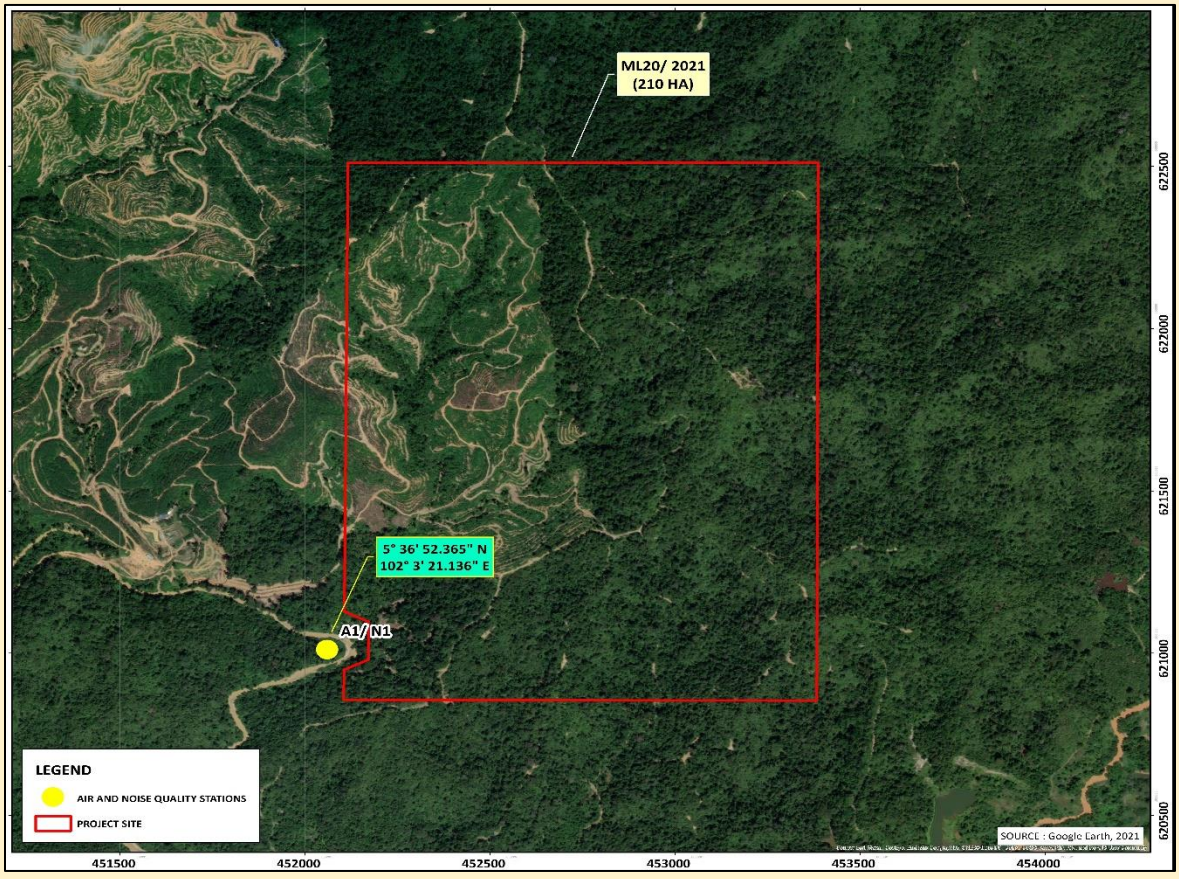
WATER QUALITY STATIONS WITH CATCHMENT & WATER INTAKE LOCATION



AIR, NOISE & GROUNDWATER SAMPLING LOCATION



Borehole No.	GPS Coordinate	
	Latitude	Longitude
GW1	5°35'58.04"N	101°57'54.93"E
GW2	5°36'14.57"N	101°58'14.07"E
GW3	5°35'46.92"N	101°58'32.89"E
GW4	5°35'47.19"N	101°59'03.80"E
GW5	5°35'21.25"N	101°58'53.38"E
GW6	5°35'21.51"N	101°58'16.21"E



EVALUATION OF POTENTIAL IMPACT

SOIL EROSION AND SEDIMENTATION

- ✓ Suspended sediment abrades and coats aquatic organisms;
- ✓ Excessive sedimentation "paves" the water body floor, blankets the bottom fauna and destroys fish spawning areas;
- ✓ Turbidity due to the suspended sediment reduces light penetration and photosynthesis, thus reducing phytoplanktonic growth and food supply to other forms of aquatic life;
- ✓ Reduction in river depth, resulting channel overflow during high rainfall

HYDROLOGY

- ✓ The process of iron ore mining has been linked to the increase of the frequency of flash flood in the downstream area.
- ✓ The changes in topography and land clearing could result in the tremendous increase in surface runoff
- ✓ The land clearing and earthwork of the proposed project for the purpose of mining iron ore may expose the large tract of bare soil to erosion.

RIVERINE RIPARIAN ZONE

- ✓ Clearing of vegetation from riverbanks will leave the area and river unprotected from erosion and sedimentation respectively. Causing a decrease in water quality through the loss of filtration effects.
- ✓ Clearing also leads to loss of critical species habitat. A river buffer zone gazetted by JPS will be kept along the rivers.streams.

EVALUATION OF POTENTIAL IMPACT

WATER QUALITY

- ✓ Water quality in mines is indirectly affected by soil erosions that carry sediments and these are not controlled or managed well.
- ✓ Release of sediments into rivers will impact the water quality: turbidity, total suspended solids and mineral contaminants.
- ✓ Fine silt increases the suspended solid and turbidity of the water bodies and can be detrimental to aquatic life
- ✓ The use of machinery and equipment on site may lead to water pollution through leakage of oil, grease and fuel into water courses.

GROUNDWATER

- ✓ A land clearing may potentially result in change onto groundwater recharge behaviour to an area.
- ✓ significant land clearing may enhance surface runoff and subsequently may cause water impoundment or flooding on area of low in elevation, low permeability and shallow in groundwater levels
- ✓ Excavation of the ground in mining operation will be essentially result in a certain extent of modification to ground condition of the site and working areas in particular
- ✓ Potential groundwater contamination and contaminant movement

AIR QUALITY

- ✓ Sources of air pollution in mines are the ore excavation, ore haulage and ore processing.
- ✓ Elevation, wind directional and wind speed greatly influence the dispersion of air pollutants with hotspot mainly lying downwind of the dominant wind directions.

EVALUATION OF POTENTIAL IMPACT

NOISE QUALITY

- ✓ The general adverse effects of noise are interference with communication, hearing loss, disturbance of sleep, stress and annoyance
- ✓ Noise at the mining site mainly is due to the mobilization of motor vehicle and machinery.
- ✓ Operators who work on or in the vicinity of noisy machinery could be exposed to a noise level, which, over a period of time, may damage their hearing systems

TERRESTRIAL FLORA

- ✓ Vegetation Loss
- ✓ Water Pollution
- ✓ Reduction in Soil Quality

TERRESTRIAL FAUNA

- ✓ Loss of species diversity and poaching
- ✓ Wildlife - Human Conflict
- ✓ Road Kills
- ✓ Loss of Habitat
- ✓ Illegal Hunting

EVALUATION OF POTENTIAL IMPACT

SOLID AND HAZARDOUS WASTE

- ✓ Cut vegetation has the potential to be a fire risk unless properly managed. Cut vegetation shall be generated during site clearing and shall consist of tree trunks, branches, shrubs and green vegetative material.
- ✓ Excavated materials from site formation, earthworks etc will consist of primarily of soils, sand and organic matter (e.g., material from swamp areas)
- ✓ The storage, handling, transport and disposal of the construction types waste has the potential to result in visual, water, dust and noise impacts in the event of inappropriate management method.

SEWERAGE

- ✓ The primary contaminants in sanitary effluents will be organic matter, coliform bacteria and suspended solids resulting in decreased dissolved oxygen content elevated organic and coliform levels in downstream watercourses.
- ✓ If the domestic sewage is not well designed and maintained, odor and diseases might be triggered.

SOCIO-ECONOMIC

- ✓ The social impacts may bring effect to the locals, either directly or indirectly and either positive or negative impacts.

COMMUNITY HEALTH

- ✓ Air pollution and elevated noise levels might have greater impact on workers but minimal impact on community
- ✓ Water and groundwater pollution can affect the workers and the community

MITIGATION MEASURES

HYDROLOGY

- ✓ Build detention ponds to provide temporary storage for the excess runoff during storm event
- ✓ Build sufficient diversion and earth drains and other BMPs on site to direct the surface runoff flows within the site to the silt trap.
- ✓ Continuous monitoring and maintenance of all the BMPs and take immediate action on any non compliance
- ✓ Enough storage volume within the ponds should be provided in order to control of 50 year ARI

SOIL EROSION & SEDIMENTATION

- ✓ More erosion prone development activities like site clearing and removal of overburden should be scheduled for the drier period of the year when the rainfall erosive would be lower.
- ✓ Maintenance of drainage system shall be regularly carried out. Re-design or add on number of drainages shall be considered from time to time viewing to the current situation;
- ✓ Maintenance of drainage system shall be regularly carried out. Re-design or add on number of drainages shall be considered from time to time viewing to the current situation;
- ✓ The staging of the Project will help to reduce potential soil erosion and the resultant sediment pollution; and
- ✓ Monitoring of water quality – The project Proponent must also monitor the water quality at the point of discharge from the Project site to ensure that the water is of an acceptable quality.

MITIGATION MEASURES

WATER QUALITY

- ✓ all BMPs such as Silt Trap, Sediment Basin, On-site Detention Pond (OSD) etc. shall be first established and regularly inspected and maintained throughout the development period.
- ✓ Water release rate from LDP2M2 design sediment pond must strictly followed
- ✓ Vegetation shall be retained and protected wherever possible and removed vegetation must be stacked to acts as natural filter to surface runoff.
- ✓ Minimize earthwork operations during periods of high rainfall
- ✓ Provision of sufficient tailings ponding area
- ✓ Zero discharge of tailing pond must be implemented during mining operational stage.
- ✓ To include emergency responses procedure in case of tailing pond outburst/overflow.
- ✓ To inform DOE any tailing pond outburst/overflow immediately.
- ✓ To include a "Riparian Monitoring Program" as part of the EMP. Entails reporting of riparian status, including visual (photos) status at all affected tributaries.

GROUNDWATER QUALITY

- ✓ A regular and consistent groundwater monitoring exercise shall be commenced.
- ✓ Preventing surface water quality degradation – appropriate mitigating and remedial measures have to be sustainably conducted in order to sustain the good surface water quality and to improve the degraded surface water quality in the Project site.
- ✓ Groundwater monitoring wells will be properly managed (maintenance) to ensure their sustainability in performing their function.

MITIGATION MEASURES

AIR QUALITY

- ✓ Exposed soil areas, excavated materials, stockpiles and haul roads shall be dampened with water during dry ambient conditions. The minimum number of wet suppression units to be provided must be specified in operation contract clauses;
- ✓ Before work commences, the contractor will prepare a dust control strategy in agreement with regulatory requirement;
- ✓ Vehicle speed restrictions shall be imposed to reduce dust generation and dispersion; and
- ✓ All lorries utilized to transport potentially dusty materials to/from the site shall be of an appropriate design to ensure load containment; transport vehicles shall not be overloaded.

NOISE QUALITY

- ✓ Low noise equipment shall be used in the operation;
- ✓ Transportation and machinery that may be intermittent shall be throttled to minimum;
- ✓ Silencers or mufflers on equipment shall be utilized and properly maintained during the operation;
- ✓ If operation noise does become an issue, additional measures such as avoiding simultaneous noisy activities shall be done;
- ✓ Workers shall be provided with suitable safety apparels such as ear plug to prevent the impact on their ears. The wearing shall be made mandatory.

MITIGATION MEASURES

SEWERAGE

- ✓ Workers shall be provided with adequate sanitation facilities;
- ✓ Toilets facilities shall be provided whereby the cleaner shall be responsible for regular site visits to collect the accumulated waste for off-site disposal;
- ✓ At least 2 toilets shall be provided for every 15 workers; and
- ✓ The waste shall be properly stored and managed to minimize contaminated run-off and avoid from flowing to the water body.

TERRESTRIAL FLORA

- ✓ Planning of Mining Activities
- ✓ Biomass Management
- ✓ Restriction of Open Burning
- ✓ Allocation of Riparian Buffer Zone and BMPs
- ✓ Minimise Exposed Surfaces

TERRESTRIAL FAUNA

- ✓ Prohibition of Wildlife Poaching and Trapping
- ✓ Prohibition of Rearing Animals at Site
- ✓ Phasing/Directional Clearing
- ✓ Wildlife-Human Conflict
- ✓ Placement of Solar Powered Spotlight
- ✓ Signage on Prohibition of Wildlife Hunting
- ✓ Preparation and Enforcement of Wildlife Management Plan (WMP)

MITIGATION MEASURES

SOLID & HAZARDOUS WASTE

- ✓ Large stumps, small branches and other organic materials shall be disposed of via mulching/composting in a suitable area within the Project site
- ✓ Surplus excavated materials and inert wastes shall be reused on site as structural fill, landscaping, erosion control and restoration features wherever applicable.
- ✓ Proponent must aware that oily residues such as spent lubricating oil (SW305) and spent hydraulic oil (SW306) are classified as scheduled wastes under the Environmental Quality (Scheduled Waste) Regulations 2005;

SOCIO-ECONOMIC

- ✓ The local communities shall also be encouraged and given the opportunity to acquire the necessary technical know-how through training scheme related to the operation.
- ✓ constantly water sprinkle the iron ore mining plant during mining period so as to reduce the amount of dust emitted into the air Wildlife-Human Conflict

SAFETY AND HEALTH

- ✓ Only well-maintained equipment shall be operated on-site and equipment should be serviced regularly during the operation;
- ✓ Ensure that the site is kept orderly and tidy with good working conditions;
- ✓ Workers shall be provided with adequate sanitation facilities. At least one latrine shall be provided for every 15 workers;
- ✓ Establish effective on-site safety procedures and emergency response plan;

ENVIRONMENTAL MANAGEMENT PLAN (EMP

Environmental monitoring comprises 3 types of monitoring:

i. Performance Monitoring (PM)

ii. Compliance (CM)

iii. Impact monitoring (IM).

PM

Monitoring to ensure that the pollution control systems and other mitigation measures are perform in a good condition to reduce the adverse impacts from the proposed Project at a minimum level

CM

monitoring activities to be carried out to ensure that the EIA condition of approval (COAs) is complied with

IM

Monitoring activities which will be conducted once the proposed project is approved for implementation to verify that the findings of the EIA study of the potential impacts identified during EIA preparation stage are correct

CONCLUSION

The main activities that produce the effect:
Site cleaning;

- ✓ Ore excavation;
- ✓ Ore transport; and
- ✓ Ore processing.

Among the activities that have the potential to have an impact:

- ✓ Dust/dust dispersion (Air quality)
- ✓ Noise production (Noise quality)
- ✓ Soil erosion and river sedimentation (Water Quality)

Main effects:

- ✓ Air pollution (PM10)
- ✓ Noise pollution (dBA)
- ✓ Water Quality (Turbidity, number of suspended solids, solution of solids and metal contaminants)

Impact Mitigation Measures:

- ✓ Maintenance and monitoring of BMPs
- ✓ Environmental Management Plan
- ✓ Environmental Auditing
- ✓ Self -regulation
- ✓ Commitment and financial allocation for BMP and other mitigation measures

The proponent's effort to commission an EIA study, thereby taking into consideration all environmentally friendly approaches and also incorporating pollution control measures in their future operations should be given strong considerations from all relevant authorities. If there is any environmental impact to the surrounding, the Project Proponent shall stop work and rectify the impact immediately at own cost.