

INTRODUCTION TO THE PROPOSED PROJECT



LAND OWNER/ PROJECT PROPONENT

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PROJECT AREA

- The project area is located in the sub district of Sungai Tiram (Mukim Sungai Tiram) within the district of Johor Bahru Tengah.
- The site covers a total area of 1,188.83 acres of land on lots MLO235, MLO745 and PTD1354 (481.10 hectares).



CURRENT CONDITION

- The surrounding area where the proposed project site is sited, are made up of mainly palm oil plantation located at the Southern, Western and Eastern parts of Project site.
- The nearest sensitive receptor is identified as Kampung Bukit Dagang, Tiram Nirvana Memorial Park, Surau Nurhidayah Kg Bukit Dagang, Sri Maha Mariamman Temple and Green Valley Eco Resort.
- Part of the project site is also within the water catchment zone for the Sultan Iskandar Reservoir which is the southern part of the proposed project.



ACCESSIBILITY

- The proposed development is accessible through the local road of Jalan Sungai Tiram. This local road is connected to the Federal Route 3/ AH18 - Jalan Kota Tinggi.
- The site can also be accessed via Senai-Desaru Expressway via Jalan Kota Tinggi (3) which will also lead to Jalan Sungai Tiram.
- The road reserve of 172.33 acres (14.48%) within the proposed development will be surrendered to the local authorities for future road expansion and upgrading works.



JURISDICTION

Majlis Perbandaran Pasir Gudang (MPPG)

LEGAL ASPECT



PRESCRIBED ACTIVITIES

Activity 17: Industrial Estate Development

Development of industrial estate covering an area of 20 hectares or more

- The site covers a total area of 481.10 hectares.



PROJECT SCHEDULE

- The project timeline will be furnished upon the availability of the project development schedule and upon approval of the EIA from the Department of Environment (DOE) Negeri Johor.
- This will be discussed in depth in the Environmental Management Plan (EMP).
- It is anticipated that 3 years will be taken for each phase whereby 2 years will be allocated for the land clearing and earthworks and 12 months is for the building and infra construction. Thus the total estimated timeline for the proposed development is 15 years.



ZONING COMPATIBILITY

- Based on RT Pasir Gudang 2030 (RTPG 2030), the Proposed Project area is located at *Zon Perancangan 2 (ZP2): Sungai Tiram, ZP2.3: Sungai Layang 3*.
- The RTPG 2030 was gazetted on 17th November 2022 through *Warta Kerajaan Negeri ref: J.P.U. 41 Jilid 66 (No. 46)*.
- In this RTPG 2030, the proposed project is located in an area where it is gazetted as agricultural land. However, the land use zoning has been changed to industrial land, industrial land (workers housing) and commercial land for the RTPG 2023 (Addendum 1).
- A submission has been made to the Majlis Perbandaran Pasir Gudang (MPPG) to revise the RTPG 2030, aiming to rezone 481.30 hectares of the project site from agricultural to industrial use. This rezoning will affect 4.46% of the total ZP2 area and 38.47% of ZP2.3.
- The zoning change application was discussed in the MPPG OSC Committee Meeting No. 366 (22/2023) on 20 November 2023, following the process adopted by Johor's Local Authorities and referring to SPC Meeting No. 03/2023 (JPN0/03/2023) dated 8 October 2023.
- According to the Rancangan Struktur Negeri (RSN) Johor Study 2023 (Review) 2016, the industrial land requirement in Johor for 2025 is projected to be 16,246.20 hectares. This project will add 450 hectares of industrial land, creating 15,000 to 17,000 job opportunities, particularly for locals in and around Pasir Gudang



STATEMENT OF NEED

Strategic Location and High Accessibility

- Ø The location of the proposed area is considered strategic with the existing neighbourhood and facility which received encouraging response from local.
- A good existing road network and new road network plan as well as the economic facilities at the area is an attraction factor to the local and foreign investors.

Rezoning of the Landuse From Agricultural To Industrial Land

- Proposed Project Site will be developed as industrial, commercial and housing development after the rezoning and will provide good employment opportunity as well as the economic opportunity to the local people.

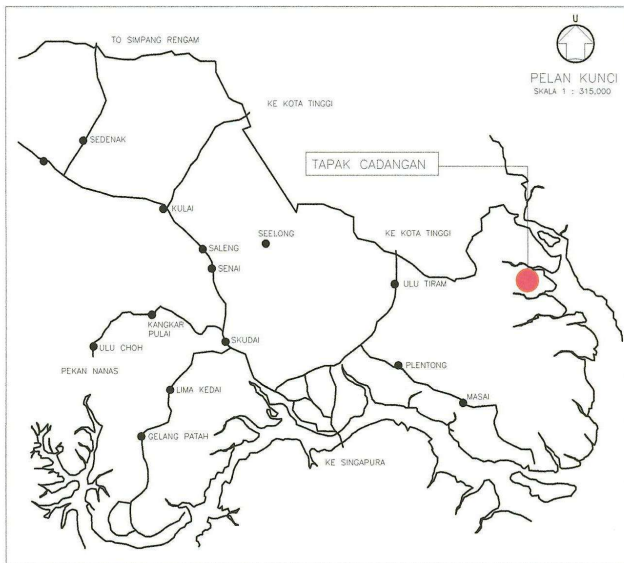
Landuse Optimization

- Ø The proposed development would upgrade the existing economic status of the Project site and the surrounding area;
- Ø The property value of the area will increase as the demand increased. Hence, will increase the state economy and income.

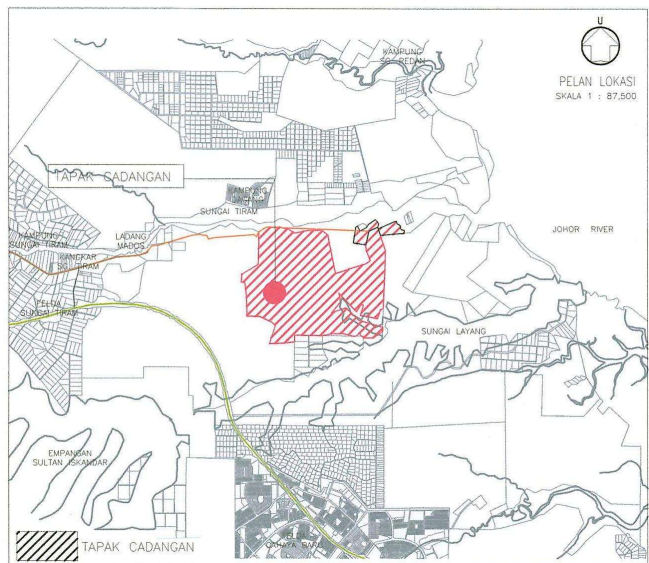
Environmental Consideration

- From an environmental point of view, the surrounding water, air quality, noise levels of the area may be affected during the construction period due to the movement of vehicles, machineries, installation of structures, etc. if no mitigation measures and BMPs are employed. With proper mitigation measures, the environmental impact of the proposed project can be minimized and controlled.

KEY AND LOCATION PLAN

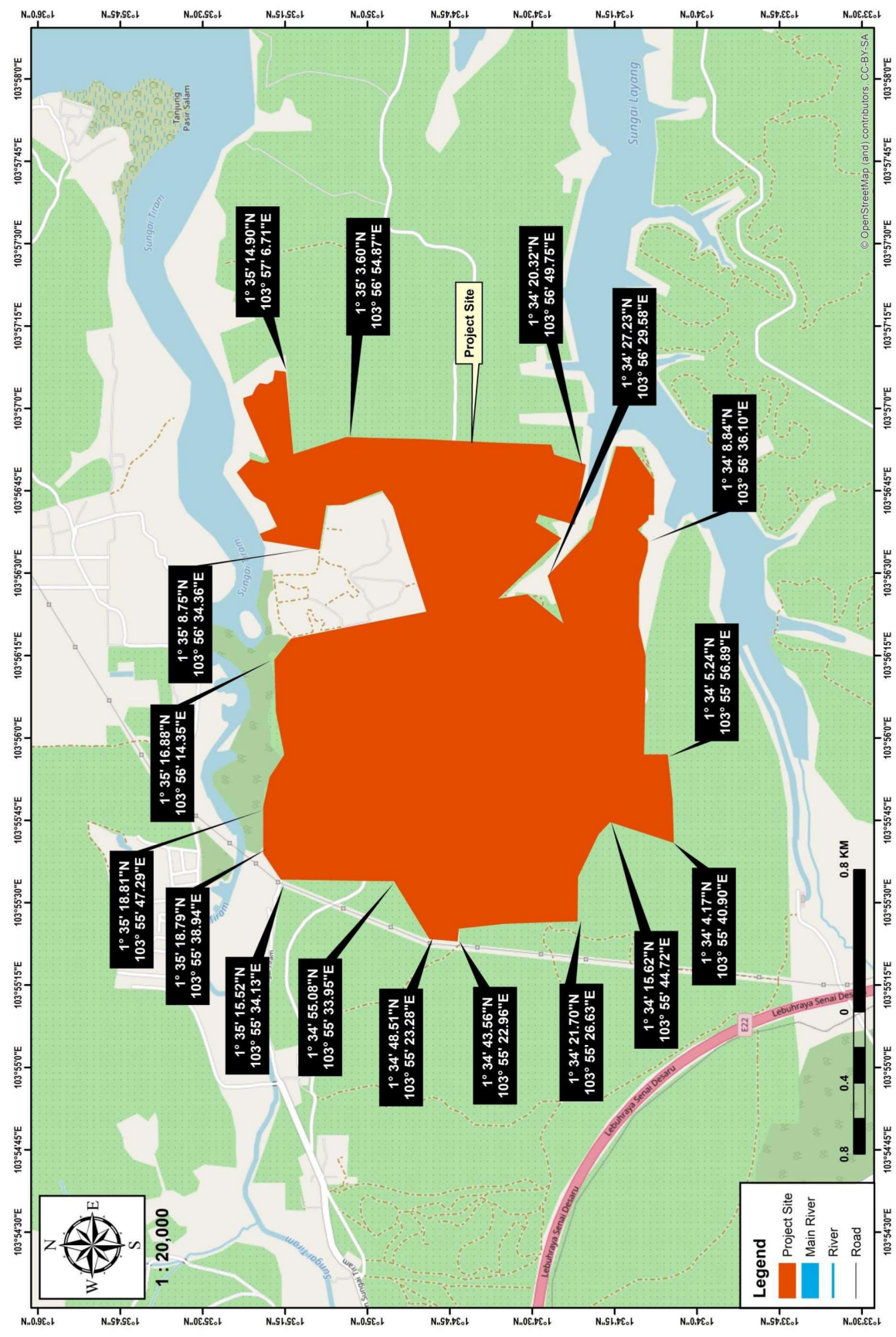


KEY PLAN



LOCATION PLAN

PROJECT BOUNDARY OF PROPOSED PROJECT



PROJECT DESCRIPTION

The proposed Project involves a total area of 1,188.803 acres (481.10 hectares) and will be developed to accommodate light and medium industrial plots, workers quarters, commercial lots and other facilities and infrastructures such as mosque, police station, fire station, sewage treatment plant, lorry depot, water tank, on-site detention pond and etc

LANDUSE COMPONENTS



INDUSTRIAL PLOT

- The development will primarily consist of industrial lots.
- It includes 70 lots for light-scale industry and 311 lots for medium-scale industry.
- These industrial plots will be developed in 5 phases.
- A housing development for workers, covering 49.4 acres, will be built during Phase 1.
- The industrial area will total 716.45 acres, making up 60.27% of the entire development area.



COMMERCIAL PLOT

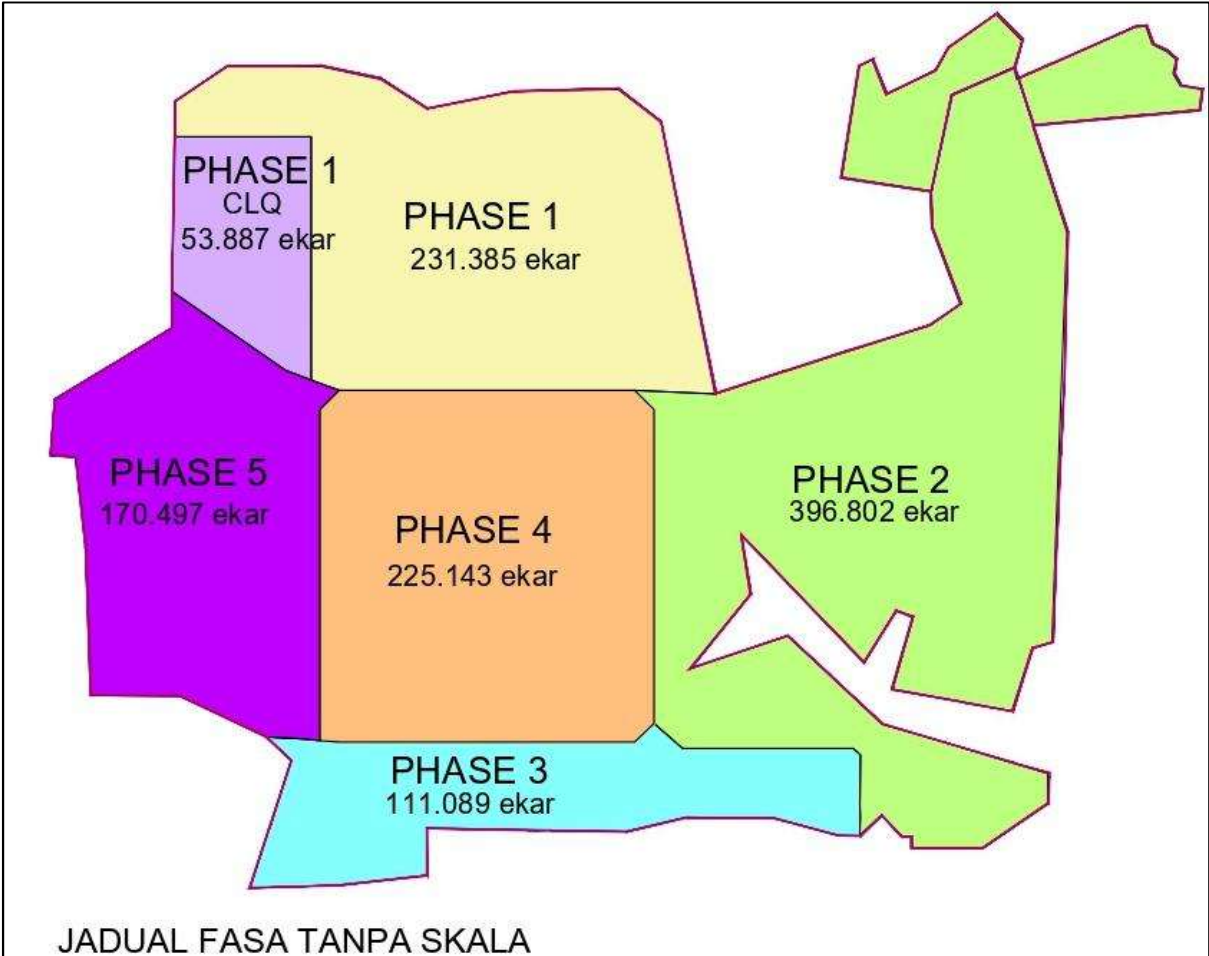
- There will be one plot constructed for the purpose of commercial and it will be constructed during Phase 5 of the Project.
- The area of the commercial plot is 21.05 acres.




FACILITIES AND INFRASTRUCTURES

- Supporting infrastructure will be integrated into the industrial development.
- Utilities such as water supply, electricity, telecommunications, internet services, and sewerage management will be included.
- A buffer zone will be provided at the sewerage treatment plant (STP) area.

PHASING DEVELOPMENT PLAN



JADUAL FASA		EKAR	%
	PHASE 1	231.385	19.464%
	PHASE 1 (PERUMAHAN)	53.887	4.533%
	PHASE 2	396.802	33.378%
	PHASE 3	111.089	9.345%
	PHASE 4	225.143	18.939
	PHASE 5	170.497	14.342%
TOTAL		1188.803	100.00%

DESIGN CONSIDERATION

Earthworks and Platform Levels

- The highest ground level at site is 52.31m above mean sea level located at the southwestern of the site and the lowest level is at the north of the site with an elevation of 0.69m above mean sea level.
- The cut volume is estimated to be 17,303,853.43m³ and the fill volume is 16,488,900.57m³, with an excess of material of 814,952.86m³.

ESCP Elements

- For the project development, seven (7) sediment basins are proposed with capacity and dimension suited to the project needs.

Drainage System

- Two detention ponds will be located at the northern part of the site.
- Detention Pond 1 will cover 37.49 acres and handle runoff from a 350-hectare area to the west.
- Detention Pond 2 will cover 22.44 acres and manage runoff from a 111-hectare area to the east.
- The project's surface runoff will be discharged into Sungai Tiram from an On-Site Detention (OSD) pond.

UTILITIES

Water Supply

- The water supply system for the proposed development will adhere to the standards set by Syarikat Air Johor (SAJ), Jabatan Bomba, and other relevant authorities.
- The average daily water demand for the development is approximately 2.7 million gallons, or 10.3 million litres.

Sewerage

- The sewerage system will use vitrified clay pipes (VCP) to handle a discharge capacity of 49,082 PE, flowing by gravity to the Sewage Treatment Plant (STP) at the lowest point of the development.
- Two pumping stations will be installed to manage the flow in lower areas and longer distances before it reaches the STP.
- The open-type STP will have two modules, each serving 25,000 PE, for a total design capacity of 50,000 PE.
- The STP will include a 30m buffer zone with a 3m setback, and the effluent discharge will be directed into Sungai Tiram

Infrastructure and Services

- The development will include various infrastructures and services for electrical supply, such as a main substation (PMU), substation divider (PPU), and double chamber PE, to meet industrial needs, including street lights and the STP.
 - Tenaga Nasional Berhad (TNB) will provide the electric supply.
 - Basic telecommunications infrastructure, including manholes and ducting, will be installed by the developer.
 - A third-party communication company, appointed later, will provide online communication services.
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EXISTING ENVIRONMENT

PHYSICAL ENVIRONMENT

TOPOGRAPHY

- ❖ The proposed site has an undulating topography, with the highest elevation at 52.31m above sea level in the southwest and the lowest at 0.69m in the north.
- ❖ The northern part of the site slopes towards Sungai Tiram.
- ❖ There are no buildings or structures; it is currently an oil palm plantation with both new and mature trees.
- ❖ Quarry and sand mining activities have led to water ponding in certain areas

SLOPE ANALYSIS

- ❖ The main components of the proposed development are in Class 2, covering 910,710.43m² with slopes ranging from 7.43% to 11.03%.
- ❖ Class 7 slopes cover a minor part of the site, measuring 369,279.82m².
- ❖ The area is highly suitable for construction with minimal geological constraints.
- ❖ Higher class areas require detailed geotechnical and geological studies due to limitations.
- ❖ Overall, the proposed area is suitable for construction, with the majority falling under Class I and Class II. Geotechnical and geological studies will be considered for any isolated patches.

GEOLOGY

- ❖ The project site is surrounded by unconsolidated sediments from the Johor or Simpang Formation, consisting of weathered sand, sandy clay, and gravel.
- ❖ The area features poorly consolidated red and white mottled clays with sandy layers.
- ❖ The sandy horizons are coarse, pebbly, and poorly sorted.
- ❖ Many of the volcanic and granitic pebbles in the beds have decomposed into kaolin.

HYDROLOGY

- ❖ The site drains into two catchment areas: Sungai Tiram to the north and Sungai Layang to the south.
- ❖ Both rivers discharge into Sungai Johor, located about 2 km east of the site.
- ❖ A tributary of Sungai Layang flows from the southeast into the Layang catchment.
- ❖ Numerous irrigation ditches within the site drain into both Sungai Tiram and Sungai Layang, which then flow into Sungai Johor and the Straits of Johor.
- ❖ Approximately 55% of the water catchment flows towards the Layang catchment, while the remaining 45% flows towards the Sungai Tiram catchment.
- ❖ Discharge from the site during construction and operational phases will flow into the Sungai Tiram catchment, highlighting the need for sustainable water and environmental management.
- ❖ Sungai Johor is 122.7 km long with a catchment area of 2,636 km², originating from Gunung Belumut and Bukit Gemuruh, and flows into the Straits of Johor. Major tributaries include Sungai Sayong, Sungai Linggiu, Sungai Semanggar, Sungai Lebam, Sungai Seluyut, and Sungai Tiram.

METEOROLOGY

- ❖ Senai Weather Station
- ❖ GPS Coordinates: 1°38' N 103°40' E
- ❖ Height above MSL: 37.8 m
- ❖ Data for the period: 2014-2023
- ❖ . Based on the data obtained from Senai Weather Station, the region experienced calm conditions 16.5% of the time. The dominant wind direction is identified to be from the northern, occurring 27.1% of the time.

EXISTING ENVIRONMENT

BIOLOGICAL ENVIRONMENT

- The site is surrounded by oil palm plantations and is within the Sultan Iskandar Dam catchment area. It is linked to three major rivers: Sungai Layang, Sungai Tiram, and Sungai Johor, highlighting its connection to the Sungai Layang Estate.
- Site observations reveal no endangered species, as the landscape is already disturbed. The well-established cover crops and oil palm trees will not be significantly impacted.
- The site has undergone previous logging, resulting in mature oil palm trees and established cover crops. Changing the land use to an industrial estate will not significantly alter the existing biodiversity due to the area's current disturbance from plantation, quarry, and sand mining activities.
- A general survey conducted from 18th to 24th November 2024 assessed the current ecological status of the project site and its surroundings.

MAMMALS



Wild Boar



Long-tailed Macaque



Monitor lizard



Plantain Squirrel






FISHERIES



Fish taxa sampled from Sg. Johor . Top left – *Megalops cordyla*, Top right - *Toxotes jaculator*, Bottom left – *Chorenemus lysan*; Botton right – *Arius sagor*



Fish taxa sampled from Sg. Johor (continued), Top left – *Lates calcarifer*, Top right – *Platycephalus* sp., Bottom left – assortment of fishes landed by fishermen

Common Fish Taxa at Sg Johor	Scientific Name
	Toxotes jaculator (Sumpit)
	Chorenimus lysan (Talang)
	Arius sagor (Bedukang)
	Megalops cordyla (Cencaru)
	Lates calcarifer (Siakap)



Platecephalus sp (Baji)



Epinephelus sp (Kerapu)



Trachinotis blochii (Bawal Emas)



Lagocephalus scaleratus (Buntal Pisang)



Polydactylus indicus (Kurau)



Pemaviridis (Kupang)



Macrobrachium Rosenbergtii (Udang Galah)



Bivalvia (Kerang)

FLORA AND MANGROVE FLORA



Figure A, B, C : Flora found within the site

Figure D : Family : Melastomaceae
(*Melastoma malbathricum* L)



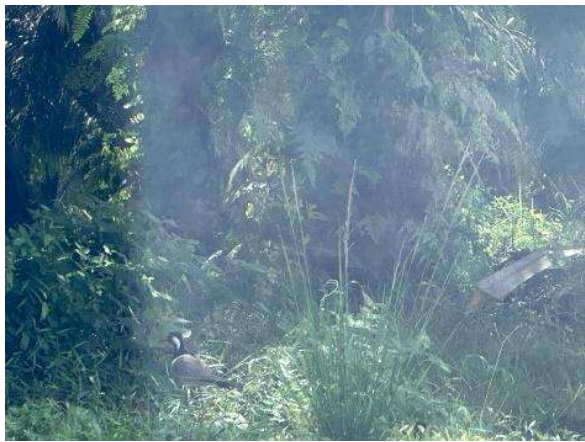
AVIFAUNA



Vanellus indicus
Red-wattled Lapwing



Amauornis phoenicurus
White-breasted Waterhen



Corvus splendens
House crows



Geopelia striata
Zebra dove

	
<p>Apus apus Common swift/Barn swallow</p>	<p>Columbidae Pigeon/Dove</p>
	
<p>Pycnonotus goiavier gourdini Yellow-vented Bulbul</p>	<p>Acridotheres tristis) Common Myna</p>

SOCIO-ECONOMIC AND HUMAN ENVIRONMENT



SOCIAL PERCEPTION SURVEY

Social survey to gauge perception on the proposed project among stakeholders on: -

- Awareness of the Project;
- Project Perception;
- Environmental nuisances;
- Human Wildlife Conflicts;
- Traffic Impact.

BASELINE ENVIRONMENTAL MONITORING

WATER QUALITY

- A total of nine (9) stations were identified throughout the Sg. Johor (SJ1, SJ2) basin, which included four points on Sg. Tiram (ST1 – ST4) and three points on Sg. Layang (SL1 - SL3)
- It can be seen that the water quality for the tested water bodies (point ST1-ST4, SL1-SL3 and SJ1-SJ2) can be classified into Class III with Water Quality Status of Slightly Polluted (SP) for Sungai Tiram, Class II with water quality status of Slightly Polluted (SP) for Sungai Layang and Class II with water quality status of also Slightly Polluted (SP) for Sungai Johor

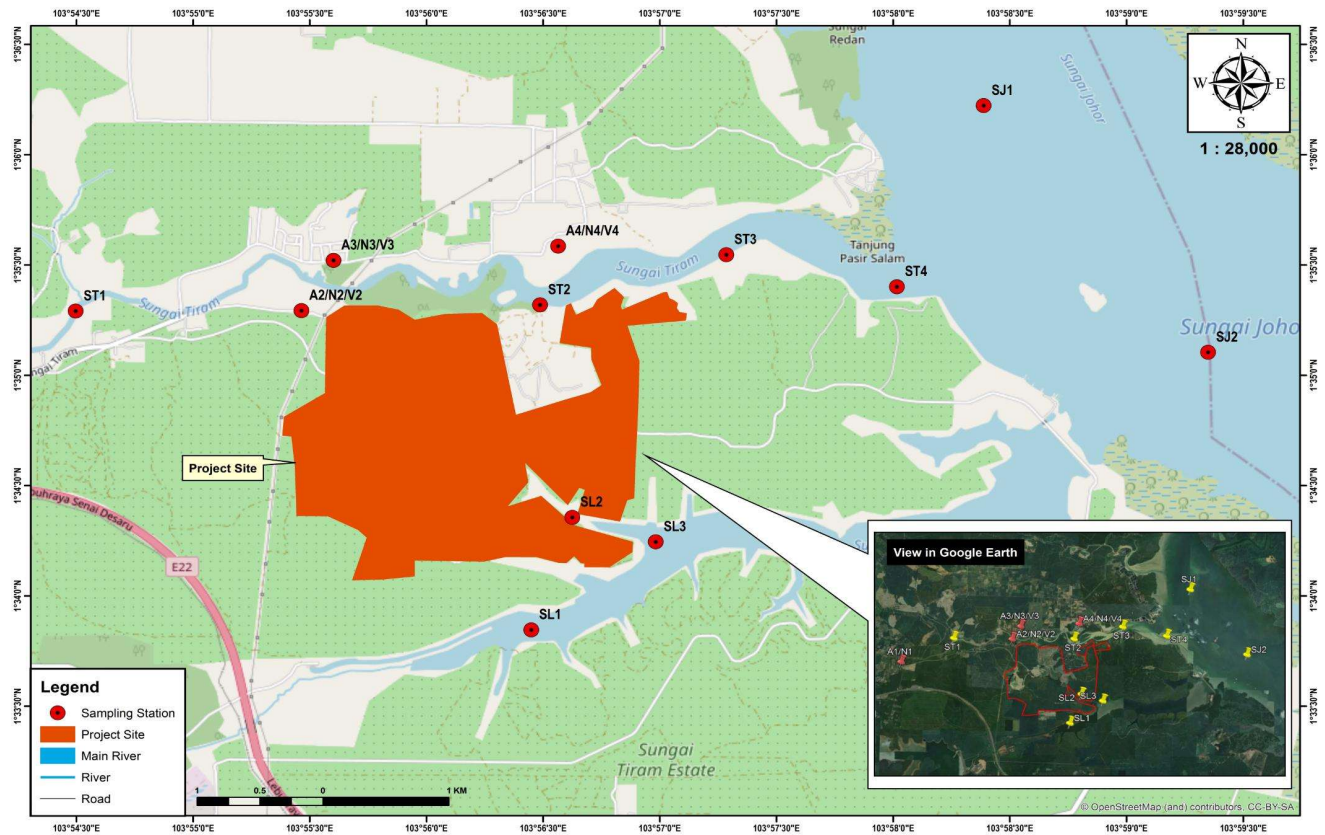
Sampling Point	WQI Classification
ST1	76, Class II (SP)
ST2	75, Class II (SP)
ST3	74, Class III (SP)
ST4	71, Class III (SP)
SL1	76, Class II (SP)
SL2	79, Class II (SP)
SL3	77, Class II (SP)
SJ1	82, Class II (C)
SJ2	77, Class II (SP)

AIR QUALITY

- Comply to the limits of the Malaysian Air Quality Standard, 2020

NOISE

- Comply to the limits of the Limiting Sound Level (LAeq) Suburban Residential (Medium Density) (60 dBA in the daytime and 55 dBA at night) of The Planning Guidelines For Environmental Noise Limits and Control (Third Edition), 2019 based on the First Schedule of Recommended Permissible Sound Level (LAeq) by Receiving Landuse for New Development; Department of Environment of the Guidelines for Environmental Noise Limits & Control, Department of Environment, 2019.



SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATING MEASURES

CONSTRUCTION PHASE

WATER QUALITY

IMPACT

I. SITE PREPARATION

Sedimentation and Dust Generation: Site preparation, including vegetation removal and earthworks, can lead to sedimentation and excessive dust, causing health, safety, and aesthetic issues for nearby residents.

Erosion and Dust Control: Effective management of earthworks is essential to mitigate erosion and dust problems, preventing both short- and long-term environmental harm.

Biomass Management: Cleared vegetation will be used as mulch to prevent soil erosion and retain nutrients, while any remaining biomass will be transported to an approved dumping site.

IMPACT

II. Earthwork

Earthworks Activities: The project involves extensive excavation and minor filling to reshape the site, generating an excess material of 814,952.86m³, carried out in five phases.

Erosion and Sedimentation Control: Surface runoff will be managed using sediment retention structures to prevent erosion and sedimentation impacts during construction.

Sediment Basins: Seven sediment basins are proposed, tailored to the project's capacity and dimensions, to effectively collect sediments from surface runoff.

IMPACT

III. Construction Runoff and Drainage

Potential Pollution Sources: Construction activities can result in surface runoff carrying waste, sediment, and contaminants such as fuel, oil, and solvents from construction vehicles, leading to toxicity and reduced dissolved oxygen levels.

Best Management Practices (BMPs): Implementing good site management practices to control and treat runoff before discharge is crucial to maintaining water quality. Regular monitoring will assess the effectiveness of these measures.

Waste and Sediment Control: Proper handling and storage of debris, rubbish, and scheduled waste (like spent lubricants and solvents) are essential to prevent pollution. Two detention ponds are proposed to manage runoff and sediment, ultimately discharging into Sungai Tiram

IMPACT

IV. SEWAGE AND SULLAGE

Wastewater Management: Sewage (liquid/solid waste) and sullage (used domestic water) must be handled and disposed of properly to prevent breeding grounds for disease-carrying insects.

Temporary Sanitation Facilities: During construction, temporary sanitation facilities like chemical toilets will be provided. These facilities must treat sewage effluent before discharge to prevent organic contamination of water bodies.

Compliance with Regulations: All sewage discharge from temporary toilets should be tested to ensure it meets Standard A of the Environmental Quality (Sewage) Regulations 2009, preventing high levels of E.Coli and Ammoniacal Nitrogen in water bodies.

MITIGATION MEASURES

- i. **Guidelines and Regulations:** The Urban Stormwater Management Manual for Malaysia (MASMA) provides guidelines to ensure public safety, prevent flooding, protect property, control erosion, and minimize environmental impacts of urban runoff. Related documents include guidelines on soil erosion and flood detention ponds, along with discharge standards under the Environmental Quality Act 1974 and Sewage Effluents Regulations 2009.
- ii. **Pollutant Control:** Major pollutants in Malaysian waters are Biochemical Oxygen Demand (BOD), Ammoniacal Nitrogen (NH₃-N), and Suspended Solids (SS), mainly from untreated sewage, livestock farming, and earthworks. Sedimentation and water filters are used to remove these pollutants.
- iii. **Water Quality Compliance:** Measures are necessary to secure a stable supply of potable water and maintain ecological health. The project site's surface water discharge must comply with Class IIB of the National Water Quality Standards (NWQS) of Malaysia, ensuring it meets environmental regulations.

SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATING MEASURES

CONSTRUCTION PHASE

AIR QUALITY

IMPACT

I. FUGITIVE DUST

Factors Influencing Dust Emissions: The amount of fugitive dust depends on operation frequency, weather, soil conditions, cleared land area, materials used, vehicle activity, and transportation routes. Dust impact varies based on particle size, with larger particles settling near the source and smaller particles (PM10) remaining airborne longer due to atmospheric turbulence.

Impact of Vehicle Activity: Heavy vehicles transporting materials can stir large quantities of dust, especially on denuded and unpaved surfaces. Vehicle movement causes soil particle pulverization and air turbulence, dispersing fine soil particles.

Dust Control Measures: Particles generally settle within 30m of the source unless wind speeds exceed 5m/s. Recommended dust control measures to comply with Malaysian Air Quality Guidelines. Wind data from Senai Weather Station suggests fugitive dust will slightly impact nearby areas during construction.

IMPACT

II. EXHAUST EMISSIONS

Exhaust Emissions: The impact of exhaust emissions from construction machinery and vehicles is dependent on their number and activity on site. Proper maintenance is crucial to minimize noxious emissions and black smoke.

Control Measures: Considering the project's location and area, implementing suitable control measures can effectively manage the environmental impacts of exhaust emissions.

Maintenance: Ensuring all construction machinery and vehicles are well-maintained and in good condition is essential to prevent excessive emissions.

MITIGATION MEASURES

Updated Air Quality Standards:

The New Malaysian Ambient Air Quality Standard replaces the 1989 guideline, adopting criteria for six air pollutants: PM10, SO2, CO, NO2, O3, and PM2.5.

Pollutant Sources and Health Impacts:

PM10 and PM2.5 are particulates with different sizes, while SO2, CO, and NO2 are gases from industrial activities and fuel combustion that affect human health. Ozone also causes respiratory issues.

Monitoring and Compliance:

Baseline monitoring of these pollutants (PM10, PM2.5, SO2, CO, NO2, and O3) is conducted for Environmental Impact Assessments (EIA). The results serve as benchmarks for future monitoring and are reported to the Department of Environment

SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATING MEASURES

CONSTRUCTION PHASE

NOISE AND VIBRATION LEVEL

IMPACT

Health Hazards of Noise Pollution: Excessive noise is a health hazard, causing hearing impairment and mental stress. Construction noise is generally short-term and localized, but it can exceed 90dB(A) near machinery.

Noise Sensitive Receptors (NSRs): Nearest NSRs include residential areas like Kampung Pasir Batu 20 (adjacent to the northwest boundary) and Kampung Bukit Dagang (400m north). Other nearby residential areas are Kampung Orang Asli Pasir Salam (2km northeast) and Kampung Sungai Tiram (3.2km west).

Noise Control and Impact: Heavy machinery generates significant noise, but attenuation over distance reduces impact. Hospital buildings, though closer, might not experience excessive noise due to distance and potential use of hydraulic piles, which generate lower noise levels (75-80dBA). The noise at the nearest hospital structure should be below 50dBA

MITIGATION MEASURES

Noise Regulation: Noise levels at the project site are controlled by the DOE, following the 2019 Guidelines for Environmental Noise Limits & Control.

Comparison with Standards: Noise results are compared with the Limiting Sound Level (LAeq) for Suburban Residential (Medium Density): 60 dBA during the day and 55 dBA at night, based on the Third Edition of the Planning Guidelines for Environmental Noise Limits and Control, 2019.

Sampling Locations: The guidelines are applied to sampling locations within residential areas, ensuring compliance with recommended permissible sound levels.

TRAFFIC & TRANSPORTATION

IMPACT

Traffic Disruption:

The movement of construction vehicles to the site will disrupt current traffic capacity.

Increased Traffic Load: Once operational, the project will further increase traffic load.

Indirect Environmental Impacts:

The rise in traffic will lead to poorer air quality from vehicle exhaust emissions and increased noise affecting nearby residential areas.

MITIGATION MEASURES

Dust Dispersion and Spillage:

- Regulate off-site waste transportation to avoid peak traffic periods.
- Limit travel speed to 30km/hr within the construction area to reduce dust dispersion and spillage.
- Ensure vehicles transporting materials are fully enclosed with proper covering.

Traffic Congestion and Safety:

- Choose transportation routes to avoid congested and populated areas, especially during peak holiday periods.
- Main access route for construction vehicles will be via Jalan Sungai Tiram.
- Observe all safety measures for loading and transporting heavy machinery and materials.

SOCIO-ECONOMIC

IMPACT

Physical and Population Impact: The proposed project, located on a palm oil plantation, will have minimal impact on the site's physical condition. However, it will bring in construction workers and potentially new residents during the operational phase.

Economic and Social Impact: The project will temporarily increase job availability during construction and operation, positively affecting the local economy. However, the influx of construction workers may lead to social changes and potential conflicts due to differences in culture and behavior, such as alcohol consumption and vandalism. Proper planning and monitoring can mitigate these impacts.

Local Economic Benefits: The project will create direct employment opportunities and additional spin-off jobs in retail and service industries. It will also increase spending in the local economy, benefit the local hospitality industry, and provide a market for building material suppliers. The local economy will receive a capital injection during the construction phase.

MITIGATION MEASURES

Legal Registration and Health Checks: Contractors must ensure foreign workers are legally registered with the Department of Immigration and have medical certificates. Regular health check-ups are required for work permit renewals.

Socio-Cultural Impact Management: Workers should be well-managed and confined to their worksites to minimize confrontation with the local community. Informing local residents about the project beforehand is also recommended.

Economic Opportunities and Business Priority: Jobs created by the project should prioritize the local population, and local businesses should be given priority for supplying materials. The State Economic Planning Unit should disseminate information on business opportunities.

Worker Camp Management: If on-site camps are used, they should be located away from residential areas and rivers to prevent pollution. Camps must adhere to Health Department guidelines, including adequate sanitation and waste management. Details of the workers' camp will be finalized in the Environmental Management Plan

SAFETY & HEALTH

IMPACT

Dust Dispersion: Machinery movement during construction will stir dust into the air, especially in dry and low humidity conditions. Larger dust particles will settle on the ground within hours, but finer particles can stay airborne for days.

Worker Base Camp Impact: Establishing a worker base camp may generate unpleasant odors, attract pests and disease vectors, and spread communicable diseases if sanitary conditions are not maintained.

MITIGATION MEASURE

Safety Precautions: Contractors must ensure safe movement and operation of heavy machinery to protect workers and nearby residents.

Restricted Access: Unauthorized personnel, especially tourists and visitors, are prohibited from major work areas to prevent incidents.

Worker Induction: All workers must be inducted on-site safety requirements before starting construction work.

Provision of PPE: Contractors are responsible for providing Personal Protective Equipment (PPE) to all workers.

SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATING MEASURES

CONSTRUCTION PHASE

WASTE MANAGEMENT

IMPACT

I. MUNICIPAL WASTE

Construction and Domestic Waste: Waste includes inert materials like crushed stones, wood, bricks, and metal, as well as domestic waste like plastic, paper, glass, and food scraps.

Health and Aesthetic Issues: Improper disposal attracts disease-carrying pests and creates foul smells, leading to potential health problems. Unattended waste can block drainage and contaminate waterways, especially during rainy seasons.

Regulation and Disposal: Municipal waste must be disposed of at approved facilities, as regulated by the Refuse Collection, Removal and Disposal By-Laws 1983.

IMPACT

II. SCHEDULED WASTE

Scheduled Waste Types: Includes spent filter cartridges, scrap batteries, mineral oils, engine cleaning fluids, spent oil and grease, solvents, and paint.

Contamination and Fire Hazard: Improper handling of scheduled waste can contaminate surface waters and pose a fire hazard on-site.

Off-Site Vehicle Maintenance: Major maintenance and repair works are unlikely to be conducted on-site; most vehicles will be serviced and repaired at nearby repair shops.

IMPACT

III. UNREGULATED WASTE

Biomass Waste: Unregulated wastes on-site mainly consist of cleared vegetation from land clearing activities.

Prohibition of Open Burning: Open burning of biomass is prohibited due to adverse air quality impacts, as per the Environmental Quality (Clean Air) Regulations, 1978.

Disposal Options: Disposal options include off-site disposal or on-site reduction through composting, with the latter preferred due to minimal volume.

IMPACT

IV. BIOMASS MANAGEMENT

Biomass Management: Clearing the site will generate vegetative biomass, which should dry on-site before being transported to a municipal landfill by a licensed contractor. Open burning of biomass is prohibited.

Erosion Control: Biomass and topsoil should be kept away from waterways or used as mulch on slopes to reduce erosion by up to 90%, per the CPESC Manual, 2010.

Waste Disposal: Improper disposal of biomass can lead to water contamination, unhealthy surroundings, and habitats for disease vectors. Effective mitigation measures are discussed in Chapter Eight. Illegal dumps can also cause fires, clog drains, and create foul odors.

Biomass Calculation: The biomass expected from the project is calculated using a modified allometric equation from Kato et al. (1978) for non-destructive forest inventory data.

MITIGATION MEASURES

Municipal Waste:

- Recycle general construction spoil on-site as much as possible (e.g., aggregate materials, cement, and rock).
- Stockpile unsalvageable construction spoil at a designated site for potential sale to salvage yards or recycling contractors. Arrange regular waste collection with registered contractors or local authorities.

Scheduled Waste:

- Dispose of scheduled wastes through a DOE licensed transporter at a recycling facility. Non-recyclable waste should be handled by the Integrated Malaysian Scheduled Waste Management Centre.
- Disposal of scheduled waste is not a key issue for the proposed project. Below is a potential licensed DOE contractor for scheduled waste services:

5E Resources Sdn. Bhd, PLO 738,
Jalan Platinum Utama,
Kawasan Perindustrian Zon 12B,
81700, Pasir Gudang, Johor
Tel: 07-2521 388

SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATING MEASURES

OPERATIONAL PHASE

WATER QUALITY

IMPACT

Water Path Degradation: Managing water quality is vital as domestic wastewater, primarily sewage and sullage, is a significant pollution source.

Erosion and Surface Cover:

- At this stage, erosion impacts are minimal due to permanent fortification structures and diverse surface covers like turfing, landscapes, roads, and buildings.
- Any pending future developments must be approved by the Department of Environment (DOE).

Surface Runoff:

- Increased surface runoff due to impervious surfaces (roads, pavements, buildings) can cause nuisance flooding downstream.
- Proper implementation of MASMA principles can mitigate this issue.

Sewerage and Water Pollution:

- The development's sewerage system uses vitrified clay pipes, discharging sewage by gravity to the Sewage Treatment Plant (STP).
- Domestic wastewater, if not properly treated, can lead to long-term environmental damage, depleting dissolved oxygen and causing foul odors in the drainage system.
- Untreated sewage can also increase pathogens like Escherichia coli, pose public health risks, and cause algal eutrophication due to higher Ammoniacal Nitrogen levels.

Key Infrastructure:

- Two pumping stations manage sewage flow, ensuring proper conveyance to the STP.
- The STP has two modules, each catering to 25,000 Population Equivalent (PE), ensuring efficient sewage treatment.

MITIGATION MEASURES

Sediment Runoff: Sediment runoff will be minimal due to pavements, turfing, landscape vegetation, and buildings. Maintaining these features is essential, but no additional measures are needed.

Post-Development Peak Flow: For new developments, the peak flow from the site to downstream public drainage must not exceed pre-development levels, per the design storm average recurrence interval. Adhering to this will help prevent downstream flooding.

Increased Surface Runoff: Urbanized areas with more impervious surfaces will see increased peak surface runoff, potentially causing downstream flooding. However, adequate flood storage, combined with well-designed and operated outlet control structures, can manage peak flood discharge.

Drainage Design: Site and perimeter drainage should be designed to handle 100-year flood volumes. Drainage reserves will be turfed and landscaped with suitable vegetation to reduce sediment runoff. Developers must obtain approval from Jabatan Pengairan dan Saliran (JPS) Negeri Johor for the Earthworks Plan, Roads, and Drainage Plan.

Litter Accumulation: Litter in the drainage system can decrease oxygen levels through waste decomposition, causing foul odor and being visually intrusive. Installing trash racks in drains leading out of the site is recommended to trap litter before it enters the main drains.

All discharge from IETS of the industries operating onsite should be made to comply with Standard A of the Industrial Effluent Regulations 2009, where required, business owners shall be required to submit separate EIA Studies documenting their discharges and control measures for their specific industry.

AIR QUALITY

IMPACT

During the operational phase, significant air pollution is not anticipated. Fugitive dust emissions will be greatly minimized due to paved roads and landscaped areas. The primary source of air pollution will be exhausting emissions from traffic movement.

MITIGATION MEASURES

Burning of domestic refuse is prohibited by law. Therefore, all garbage must be placed in plastic bags for collection. It will be stored at a centralized location within the project site and collected by contractors licensed with the Majlis Perbandaran Pasir Gudang (MPPG). No burning of waste is allowed within the development areas. However, should any of the operating premises have air emissions (such as chimney stacks from their process lines) these must be discussed separately in individual EIA assessments specific to that particular industry and project.

NOISE LEVEL

IMPACT

During the operational phase of this commercial development, noise impacts from the project site will be significantly reduced. Although there might be some increase in noise levels due to everyday activities, no adverse impacts are anticipated for the neighboring resident

MITIGATION MEASURES

Noise levels are expected to increase slightly compared to pre-development conditions due to an influx of approximately 10,000 people at full operational capacity. However, this increase is not anticipated to pose any problems, as the entire area will be well landscaped and equipped with noise-reducing structures and architecture.

SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATING MEASURES

OPERATIONAL PHASE

WASTE MANAGEMENT

IMPACT

Waste Composition:

- Mainly domestic waste, including food matter, paper, packaging materials, kitchen waste, garden waste, plastic, and paper.

Improper Handling Risks:

- Open burning of waste causes respiratory discomfort for nearby residents.
- Dumped waste can be a fire hazard during the dry season.

Drainage Issues:

- Clogged drains lead to localized flooding.
- Accumulated degradable waste creates unhygienic conditions with foul odors and unsightly views.

Public Health Concerns:

- Unhygienic conditions can lead to public health problems.

MITIGATION MEASURES

Regulation and Coordination: Solid waste disposal must be coordinated with local authorities, specifically Majlis Perbandaran Pasir Gudang (MPPG) or a licensed contractor.

Daily Waste Removal: The appointed contractor will handle daily waste removal.

Landfill Usage: Waste will be dumped at the Seelong Sanitary Landfill, managed by SWM Environment.

Location: Seelong Landfill,

KM2.5 Jalan Ulu Tiram-Kulai

Operation: SWM Environment

Status: Operational

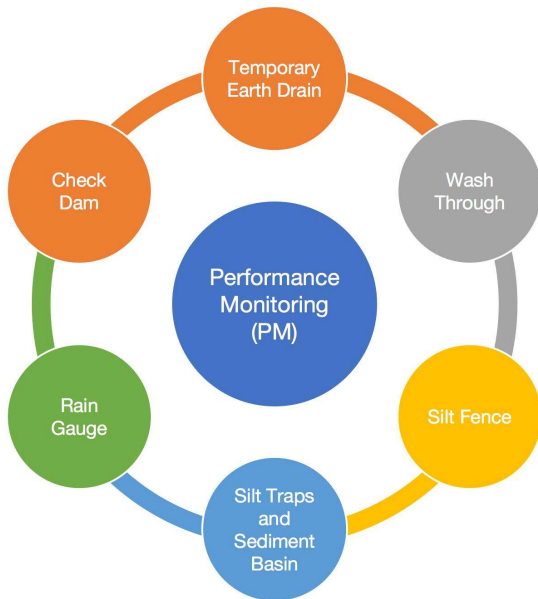
Area: 275 acres

Encouraging Recycling: Promote recycling of household items such as bottles, tins, paper, and plastic.

- Place recycling bins at strategic locations (e.g., each floor of residential towers, car parks, recreational areas).
- Ensure regular cleaning of bins to prevent

PERFORMANCE MONITORING (PM)

COMPLIANCE MONITORING (CM)



The item for CM is the final discharge point from the sediment basins outlet within the site. The parameter involved is Total Suspended Solids and Turbidity. The limits for both parameters are 50mg/L and 250NTU respectively

IMPACT MONITORING (IM)

Monitoring location	Coordinates	Parameters	Description
ST1	1°35'17.49"N	Manganese as Mn, mg/L	Upstream of Sungai Tiram
	103°54'29.87"E	Nickel as Ni, mg/L	
ST2	1°35'19.18"N	Tin as Sn, mg/L	Midstream of Sungai Tiram
	103°56'29.24"E	Zinc as Zn, mg/L	
ST3	1°35'32.82"N	Boron ad B, mg/L	Midstream of Sungai Tiram
	103°57'17.15"E	Iron as Fe, mg/L	
ST4	1°35'24.10"N	Phenol, mg/L	Downstream of Sungai Tiram
	103°58'0.98"E	#Free Chlorine, mg/L	
SL1	1°33'50.79"N	Sulphide as S ²⁻ , mg/L	Upstream of Sungai Layang
	103°56'26.96"E	Oil & Grease, mg/L	
SL2	1°34'21.39"N	Silver as Ag, mg/L	Sungai Layang adjacent to site
	103°56'37.54"E	Potassium as K, mg/L	
SL3	1°34'14.73"N	Aluminium as Al, mg/L	Downstream of Sungai Layang
	103°56'59.01"E	Selenium as Se, mg/L	
SJ1	1°36'13.38"N	Barium as Ba, mg/L	Upstream of Sungai Johor
	103°58'23.29"E	Flouride ad F, mg/L	
SJ2	1°35'6.27"N	Formaldehyde, mg/L	Downstream of Sungai Johor
	103°59'21.02"E	Ammoniacal nitrogen as NH ₃ N, mg/L	
A1	1°34'51.49"N	Colour, ADMI at original pH	Kampung Sungai Tiram (Tanah Perkuburan)
	103°53'38.40"E	Colour ADMI at pH 7.0	
A2	1°35'17.63"N	Salinity, ppt	Kampung Pasir Batu 20
	103°55'27.91"E	Enterococci, cout/100ml	
A3	1°34'51.49"N	Particulate Matter (PM10)	Kampung Bukit Dagang
	103°53'38.40"E	Particulate Matter (PM2.5)	
A4	1°35'17.63"N	Sulphur Dioxide (SO ₂)	Green Valley Eco Resort
	103°55'27.91"E	Nitrogen Dioxide (NO ₂)	
N1	1°35'31.28"N	Carbon Monoxide (CO)	Kampung Pasir Batu 20
	103°55'36.14"E	Ozone	
N2	1°35'35.17"N		Kampung Bukit Dagang
	103°56'33.87"E		
N3	1°35'35.17"N	Limiting Sound Level (LAeq) Suburban Residential (Medium Density) and Commercial Business Zones	Kampung Sungai Tiram (Tanah Perkuburan)
	103°56'33.87"E		
N4	1°35'17.63"N		Kampung Pasir Batu 20
	103°55'27.91"E		
V2	1°35'31.28"N		Kampung Bukit Dagang
	103°55'36.14"E		
V3	1°35'35.17"N	Recommended Limits for Human Response and Annoyance from Short Term Vibrations of Residential and Commercial & Business Category for day time and night time	Green Valley Eco Resort
	103°56'33.87"E		
V4	1°35'35.17"N		Green Valley Eco Resort
	103°56'33.87"E		