

Environmental Impact Assessment (EIA)

Projek Membina Jalan Baharu Dari Kg. Sg. Derhaka ke Kg. Gong Pipit, Kuala Terengganu, Terengganu

Project Summary

The Project is proposing the construction of a new 1.7 km road between Kg. Sg. Derhaka and Kg. Gong Pipit to alleviate the traffic congestion in the area. The proposed road will be constructed based on JKR R2 road specification for the major road dan JKR R1 specification for the minor road

EIA First Schedule: Activity 20(C)

Construction of road, tunnel or bridge traversing or adjacent or near to environmentally sensitive area

Location

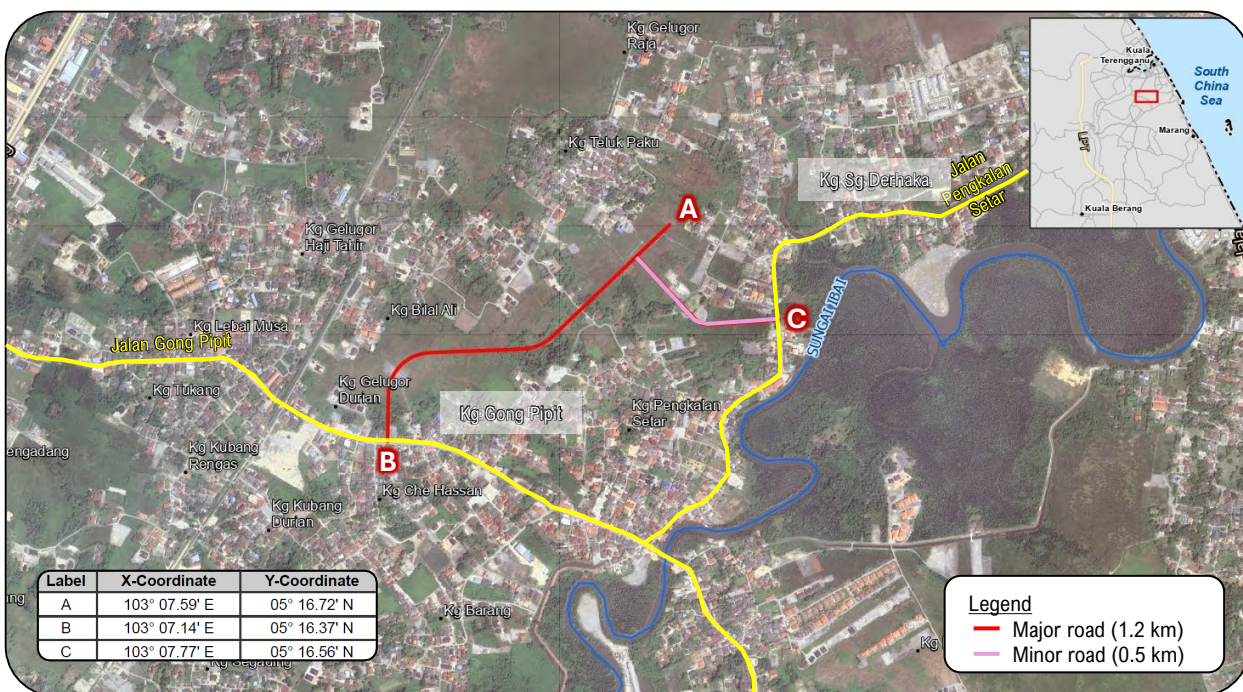
Kuala Terengganu, Terengganu

Development component

- Major road (1.2 km)
- Minor road (0.5 km)
- Road drainage system
- Street lighting system

Environmentally Sensitive Areas (ESA)

Sg. Ibai (ESA Rank 1)




Need for the Project

- **Increasing connectivity between villages** by providing an alternative road connecting Kg. Sg. Derhaka & Kg Gong Pipit
- **Promote local economic growth** by increasing accessibility to local SME operations
- **Mitigate traffic congestion** by providing an alternative road to divert traffic flow from existing road system


Project Owner

Kementerian Kemajuan Desa dan Wilayah
 Tel: 03-8891 2050

Head of Project Team (HOPT)

Bahagian Pengurusan Projek Luar Bandar
 Tel: 03-2610 7964

Project Implementer

Jabatan Kerja Raya Malaysia

Head of Design Team (HODT)

Bahagian Rekabentuk Jalan Zon Utara
 Tel: 03-2859 8576

EIA Consultant

Aurecon Lestari Sdn Bhd
 Tel: 03-7454 7900
 Fax: 03-7732 1034

Cawangan Alam Sekitar dan Kecekapan Tenaga (CASKT)
 Tel: 03-2859 8550

Cawangan Kejuruteraan Geoteknik
 Tel: 03-2859 4676

Cawangan Kontrak dan Ukur Bahan
 Tel: 03-2616 5033

Cawangan Kejuruteraan Elektrik
 Tel: 03-2618 9850

Executive Summary

Project Option

Without Project

- The Project site remains as an underutilised, overgrown land and any perceived benefits from the Project remains unrealised.

With Project

- The Project benefits the local community based on the following aspects

Alignment & land acquisition

- Utilisation of unused, overgrown land
- Acquisition of unutilised agriculture land is expected to reduce overall project cost
- Alignment allows for future road connections

Road connectivity

- Provide alternative route to travel between Kg. Sg. Derhaka and Kg. Gong Pipit
- Reduce traffic congestion and road safety risk
- Better travelling experience with improve road condition and better illumination

Economic growth

- Increasing accessibility and visibility of the local *keropok* producers to a larger audience and prospective business partners
- Promote local SME products to a larger market

Environmental & social impacts

- Develop and otherwise underutilised land
- Prevents misuse of unattended land for waste disposal ground or other unsavory activities
- Aid in controlling the proliferation of pest and dangerous animals

Principal Project Activities

Pre-construction

- Planning & site investigation
- Land acquisition

Construction

- Mobilization and establishment of site office, light maintenance workshop, and workers' camp
- Site clearing
- Earthwork activities
- Construction of road
- Construction of drainage system
- Road furniture installation
- Utilities installation

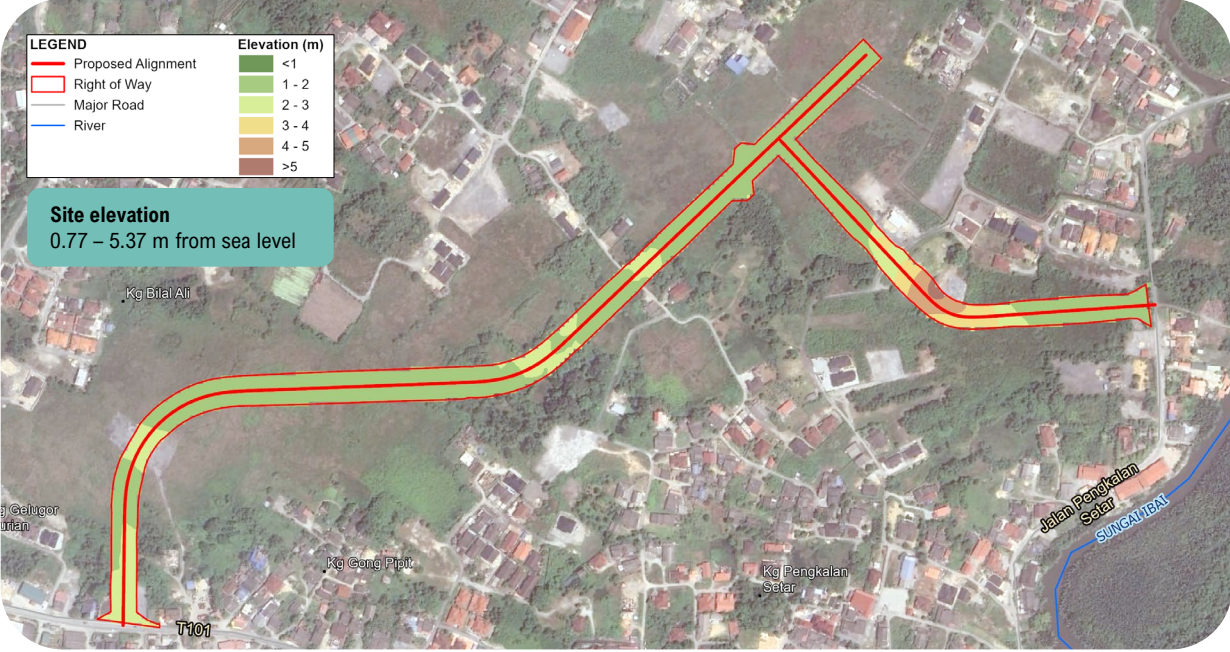
Operation

- Maintenance of road structure, slopes, drainage & supporting structures

Project Implementation Schedule

| Activity | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 |
|--------------|------------|-------------------|-------------------|------|-------------------|------|------|
| Planning | Q2-Q3 2023 | | | | | | |
| Design | | Q3 2023 - Q3 2024 | | | | | |
| Procurement | | | Q3 2024 - Q3 2025 | | | | |
| Construction | | Q3 2025 - Q3 2028 | | | | | |
| Handover | | | | | Q3 2028 - Q3 2029 | | |

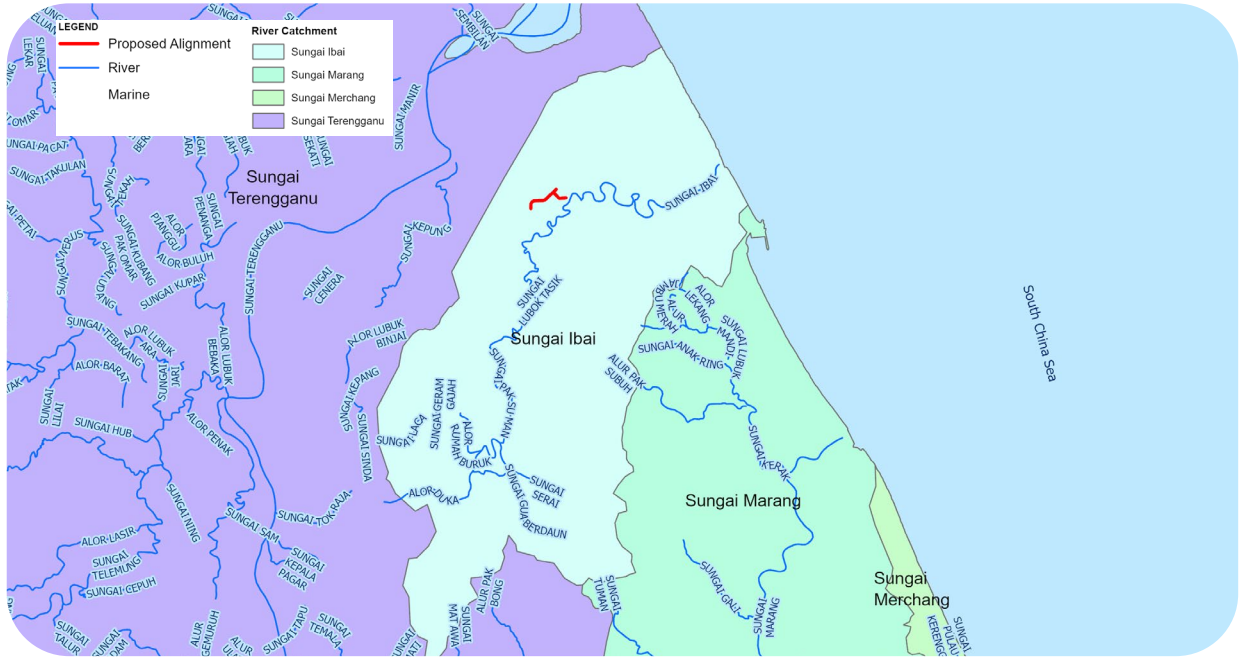
Topography



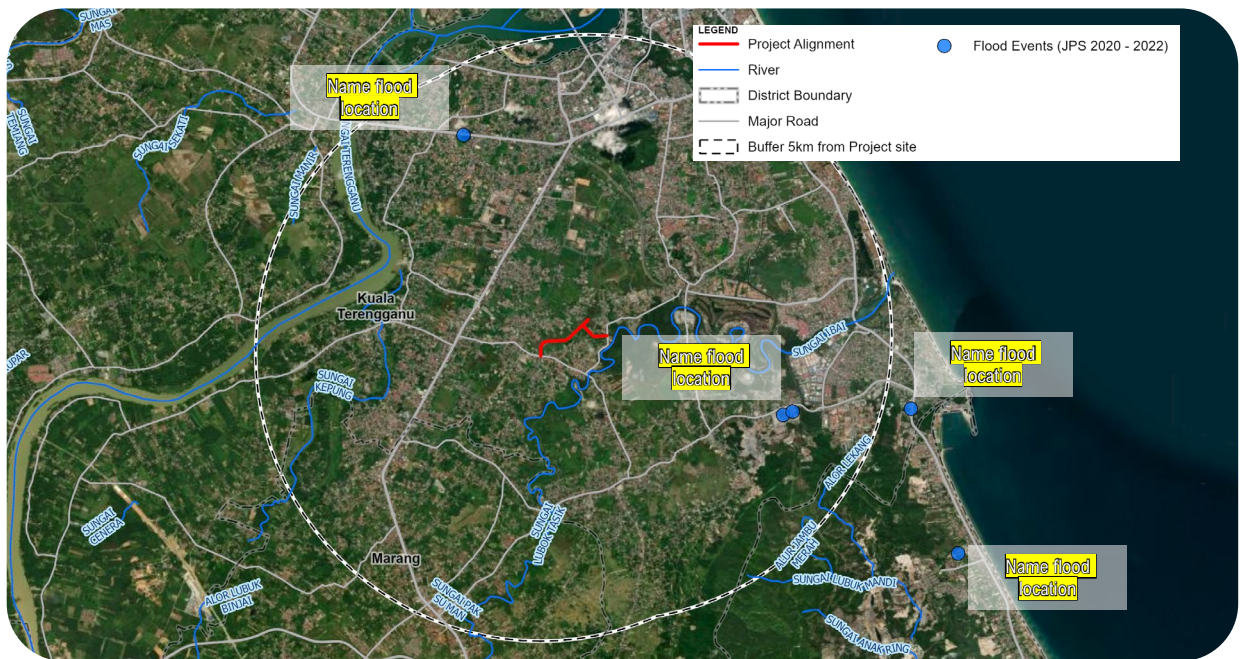
Slope Class



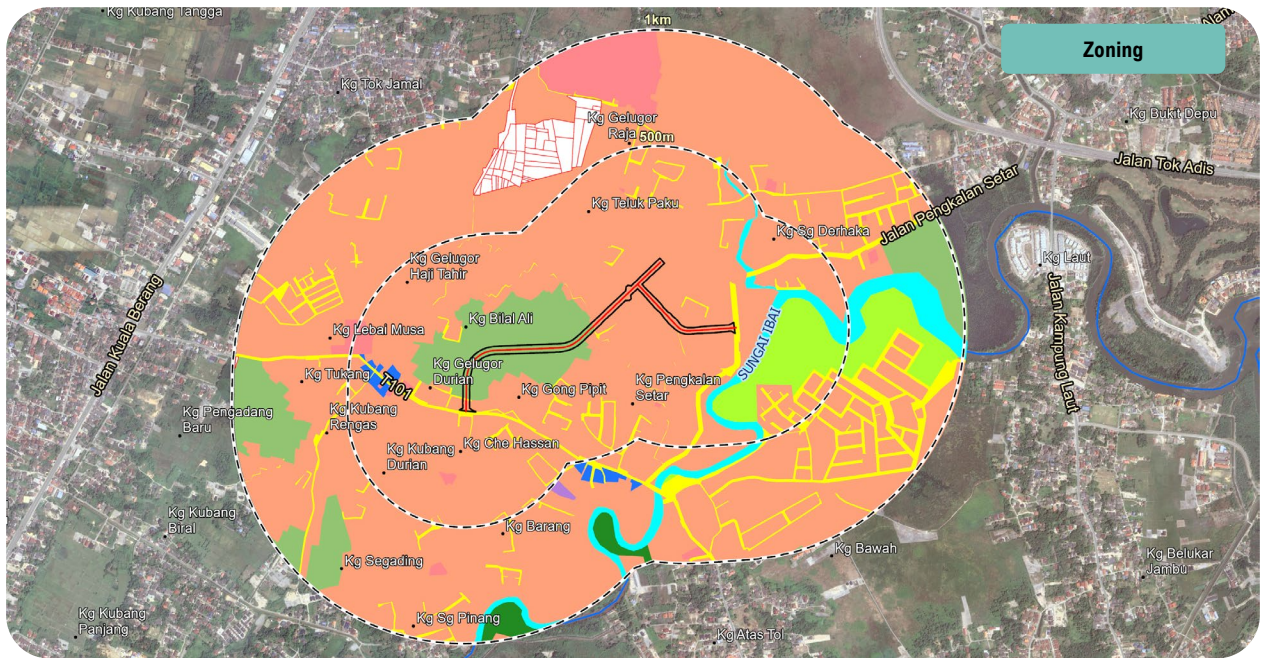
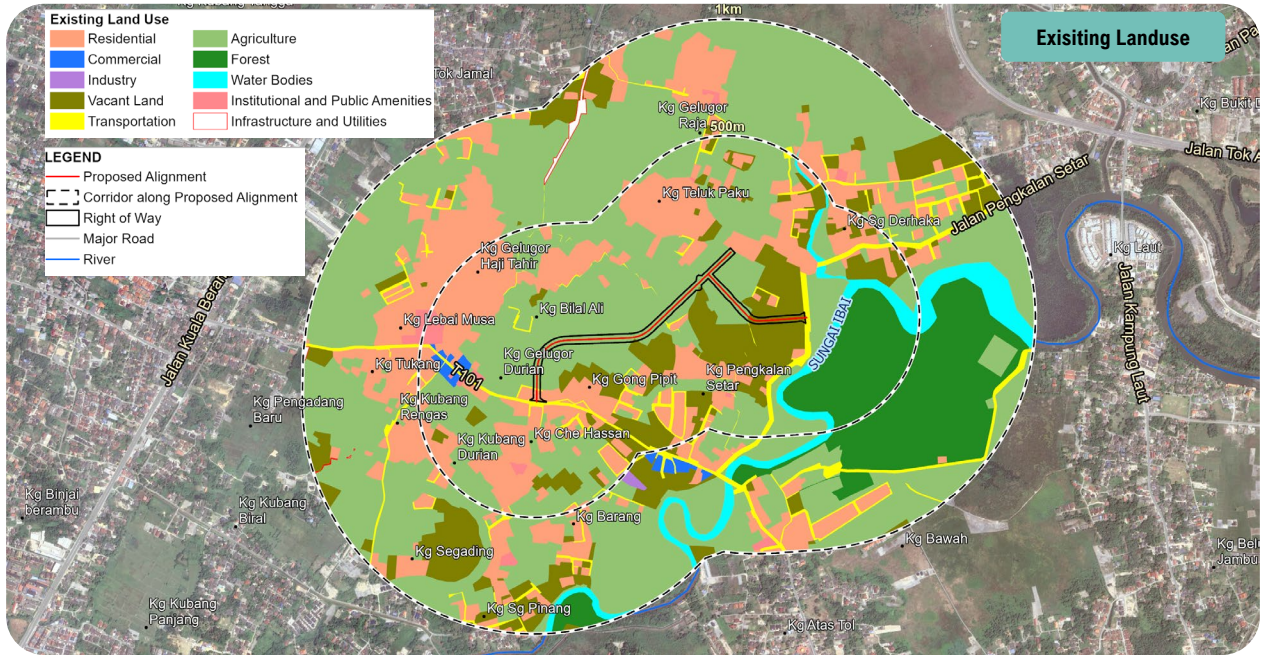
Hydrology



Flood Prone Area



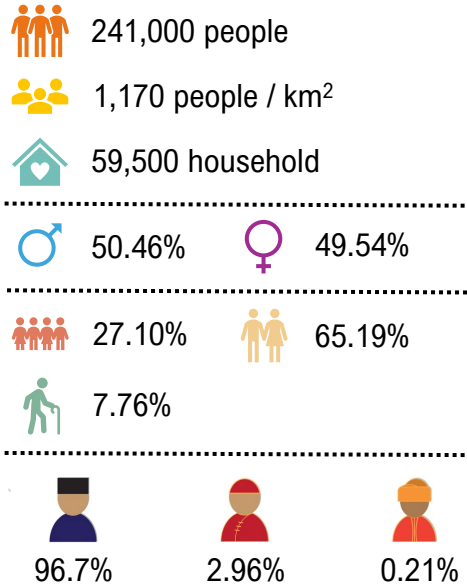
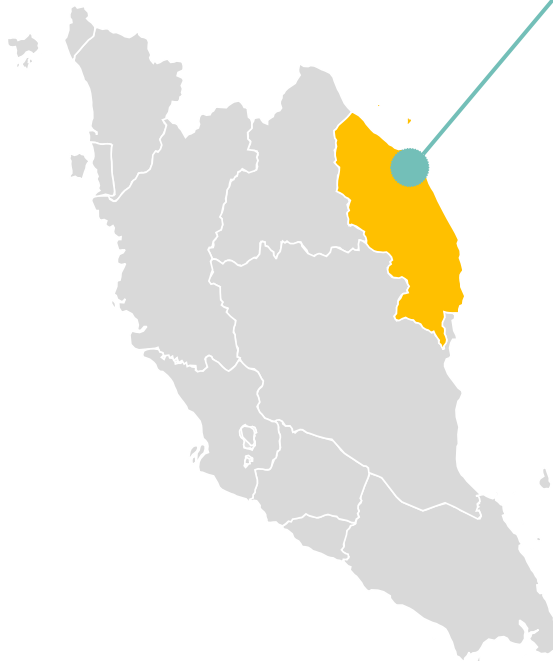
Landuse Status



| Landuse | Existing | | Zoning | |
|-------------------------------|--------------|--------------|--------------|--------------|
| | 500 m | 1 km | 500 m | 1 km |
| Water body | 2.67 | 3.14 | 2.67 | 3.14 |
| Forest | 8.07 | 10.08 | - | 1.15 |
| Industry | 0.05 | 0.10 | 0.05 | 0.10 |
| Infrastructure & Utility | - | 0.25 | - | 3.11 |
| Public facility & Institution | 0.68 | 0.61 | 0.66 | 4.01 |
| Commercial | 0.49 | 0.30 | 0.49 | 0.30 |
| Transportation | 3.44 | 3.74 | 4.62 | 6.23 |
| Agriculture | 43.40 | 55.99 | 9.87 | 6.44 |
| Residential | 26.31 | 17.39 | 76.19 | 73.18 |
| Vacant land | 14.90 | 8.41 | - | - |
| Open land and recreation | - | - | 5.46 | 2.34 |

Socioeconomic

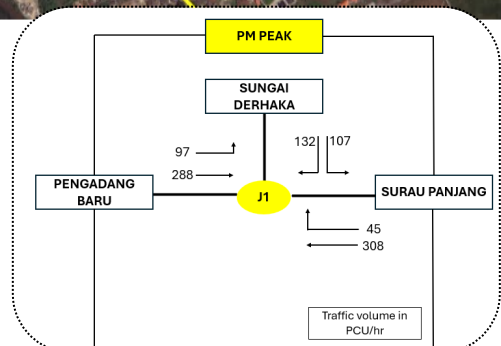
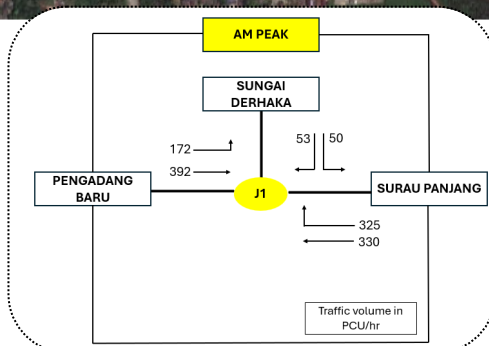
Kuala Terengganu (2023)



Traffic



| Level of Service (LOS) | Masa | |
|--------------------------------------|------|----|
| | AM | PM |
| Screenline 1 – Jalan Gong Pipit (S1) | D | D |
| Pengkalan Setur Junction (J1) | A | A |



Environmental Baseline Sampling



Water Quality

Monitoring location

6 in Sg. Ibai
3 in waterway in project site

Sampling parameter

pH, Temperature, DO, Turbidity, COD, BOD, TSS, NH₃-N, O&G, P, NO₂⁻, NO₃⁻, Hg, As, CN, Al, CU, Pb, Mn, Ni, Zn, Fe, Cd, Cr³⁺, Cr⁶⁺, Se, B, Salinity, Conductivity, Total coliform, Faecal coliform, Flow rate.

Findings

Parameters not complying with *National Water Quality Standard (NWQS) Kelas III*:

- DO: W9 (1.9 mg/l)
- NH₃-N: All except W2 (1 – 2.9 mg/l)
- NO₂⁻: W7 & W9 (0.4 mg/l)
- Fe: All except W9 (1.929 – 4.385 mg/l)

Air Quality

Monitoring location

1 in Kg Gong Pipit
1 in Kg Sg Derhaka
1 in dalam kawasan jajaran

Sampling parameter

PM₁₀, PM_{2.5}, NO₂, SO₂, O₃, CO

Findings

All sampled parameters comply with the *Malaysia Ambient Air Quality Standards (MAAQS)*

Noise & Vibration

Monitoring location

1 in Kg Gong Pipit
1 in Kg Sg Derhaka
1 in dalam kawasan jajaran

Sampling parameter (Noise)

L_{eq}, L_{max}, L_{min}, L₁₀, L₉₀

Sampling parameter (vibration)

Peak particle velocity (PPV)

Findings (Noise)

Noise readings at N3 exceeded the limits of the Fourth Schedule (65 dBA (day) and 60 dBA (night)).

Findings (Vibration)

Vibration readings at all locations except V3 comply with the limits of the Third Schedule

Potential Impacts & Proposed Mitigation Measures

Land Acquisition

Pre-Construction

| Receptors | Potential Impacts | Proposed Mitigation |
|--|---|--|
| Private landowners (residential, commercial, agricultural) | <ul style="list-style-type: none"> Loss of property due to land acquisition. Displacement of residents and businesses, leading to loss of livelihood. | <ul style="list-style-type: none"> Conduct community engagement through dialogue/meetings with stakeholders. Address land/property issues, compensation, and relocation clearly and amicably. Ensure mutual agreement on land acquisition and compensation. - Engage with the community to discuss relocation plans for affected businesses. |

Soil Erosion & Sedimentation

Construction

| Receptors | Potential Impacts | Proposed Mitigation |
|---|--|---|
| <ul style="list-style-type: none"> Kg. Sg. Derhaka Kg. Gong Pipit Sg. Ibai | <ul style="list-style-type: none"> Increased deposition of soil on roads and blockage of drainage systems Generation of contaminated surface runoff Deterioration of water quality and alteration of aquatic ecosystem in Sg. Ibai. | <ul style="list-style-type: none"> Pre-construction Planning: Minimise exposed areas, avoid clearing during heavy rain, stabilise access roads, and plan laydown areas with safety measures. Erosion Control: Protect exposed area with blankets/geotextile or turf within 14 days to stabilise areas. Surface Runoff Control: Construct earth drains, install check dams and silt fences to control runoff and sediment. Sedimentation Control: Install silt fences and traps to capture runoff and sediment and use wash troughs to prevent soil on public roads. Inspection & Maintenance: Weekly inspections, immediate repairs, and updates to measures during the EMP stage. |



Example of Slope Protection



Silt Fence along Perimeter



Example of Check Dam



Example of Silt Trap

Potential Impacts & Proposed Mitigation Measures

Water Quality

Construction

| Receptors | Potential Impacts | Proposed Mitigation |
|---|---|--|
| <ul style="list-style-type: none"> • River <ul style="list-style-type: none"> ➢ Sg. Ibai | <ul style="list-style-type: none"> • Exposed soil due to site clearing and earthworks activities can generate surface runoff high in total suspended solids that discharge into waterways • Spillage and/or leakage of hazardous substances through improper storage and maintenance of machinery and equipment | <ul style="list-style-type: none"> • Implement and maintain all LD-P2M2 measures. • Install silt traps, sediment barriers, or check dams to prevent sediment flow into rivers. • Ensure proper grading and controlled drainage systems. • Compact disturbed earth and re-vegetate exposed areas after construction. • Use temporary barriers/check dams to maintain natural water flow. • Design culverts to avoid water flow constriction. • Monitor water discharge and flow patterns. • Prevent oil and grease disposal into drains, clean up spills promptly. • Perform vehicle maintenance in designated areas with spill containment. • Prevent petroleum product spillage using proper storage and handling. • Store oil, fuel, and hazardous materials in leak-proof containers. • Set up designated fueling and maintenance areas with spill containment systems. • Implement Emergency Response Plans (ERP) for leaks/spills. • Dispose of hazardous materials according to regulations. • Conduct flood risk assessments. • Build temporary drainage systems before earthworks to manage runoff. • Raise roads/embankments above flood levels. • Regular inspection of drainage systems to prevent blockages. |

Operation

| Receptors | Potential Impacts | Proposed Mitigation |
|---|---|--|
| <ul style="list-style-type: none"> • River <ul style="list-style-type: none"> ➢ Sg. Ibai | <ul style="list-style-type: none"> • Surface runoff from road users, may contain suspended solids, heavy metals, oil and grease. | <ul style="list-style-type: none"> • No specific mitigation measures are deemed necessary as the expected impact is minimal. Pollutants washed into the river are unlikely to cause noticeable water pollution due to the dilution effect during continuous rainfall. |

Potential Impacts & Proposed Mitigation Measures

Geology

Construction

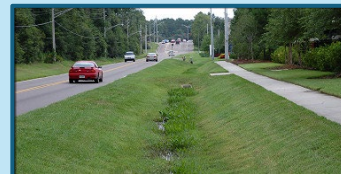
| Receptors | Potential Impacts | Proposed Mitigation |
|---|---|---|
| Exposed flat and unconsolidated sediments along project alignment | <ul style="list-style-type: none"> Excavating unconsolidated Quaternary deposit can expose the unstable layers that lead to soil erosion Ground settlement during filling and road compaction | <ul style="list-style-type: none"> Conduct geotechnical assessments and soil testing during detailed design. Stabilise subgrade materials with proper compaction and adhere to JKR specifications. Employ ground improvement techniques like soil stabilisation. Ensure proper soil compaction using heavy machinery. Implement drainage systems (culverts, roadside drains, etc.) to reduce water accumulation and settlement. Elevate the road platform level in low-lying areas to avoid regional floods. Design proper drainage systems to divert surface water away from the site. Control groundwater levels and manage surface runoff during construction. Implement dewatering measures to reduce groundwater level reduction. Use permeable pavement and shoulder design to recharge groundwater and reduce surface runoff. Incorporate vegetated filter strips, swales, and groundwater monitoring wells to promote infiltration and maintain groundwater stability. |



Example of Permeable Shoulder and Pavement



Example of Vegetated Filter Strips



Example of Swales

Operation

| Receptors | Potential Impacts | Proposed Mitigation |
|--|---|---|
| Roadside subgrade and the proposed access road | <ul style="list-style-type: none"> Poorly compacted subgrade area may become saturated during heavy downpours and eventually lead to soil erosion. Potential of road settlement occurs when heavy vehicle movement exerts force on the road | <ul style="list-style-type: none"> Clear debris from drainage channels. Repair cracked drainage or pavement. Remove harmful vegetation. Re-turf bare areas. |

Potential Impacts & Proposed Mitigation Measures

Air Quality

Construction

| Receptors | Potential Impacts | Proposed Mitigation |
|--|--|---|
| <ul style="list-style-type: none"> • Kg. Gong Pipit • Kg. Pengkalan Setar • Kg. Gelugor Durian • Kg. Teluk Paku • Kg. Bilal Ali | <ul style="list-style-type: none"> • Short-term exposure to fugitive dust from earthwork and exhaust emission from machineries. | <ul style="list-style-type: none"> • Clear site in phases to minimise exposed areas. • Prohibit open burning. • Cover cleared slopes with geotextile. • Turf or re-vegetate exposed areas within 14 days. • Regular water spraying to control dust. • Cover soil stockpiles and spray water. • Impose speed limits within construction sites. • Wash vehicle wheels before leaving site. • Provide wash trough at entry/exit points. • Cover vehicles carrying earth/materials with tarpaulin. • Use fuel-efficient, well-maintained trucks. • Repair malfunctioning vehicles immediately. • Discourage engine idling. • Water turf on exposed soil to prevent wind-blown dust. • Increase water spraying frequency during dry season. |



Example of Water Bowser Utilised at Site



Example of Soil Stockpiles Covered with Geotextiles Sheet



Example of Wash Trough at Site

Operation

| Receptors | Potential Impacts | Proposed Mitigation |
|--|--|--|
| <ul style="list-style-type: none"> • Kg. Gong Pipit • Kg. Pengkalan Setar • Kg. Gelugor Durian • Kg. Teluk Paku • Kg. Bilal Ali | <ul style="list-style-type: none"> • Minor vehicular emission dispersion changes due to alternative road. | <ul style="list-style-type: none"> • The proposed road will have minimal impact on air pollution. • By reducing congestion on Jalan Pengkalan Setar, the road will improve traffic flow. • Improved traffic flow is expected to reduce vehicle emissions from idling and stop-and-go conditions. • Overall, the alternative road will contribute to a reduction in stagnating emissions in the surrounding area. |

Potential Impacts & Proposed Mitigation Measures

Noise

Construction

| Receptors | Potential Impacts | Proposed Mitigation |
|--|---|--|
| <ul style="list-style-type: none"> • Kg. Gong Pipit • Kg. Pengkalan Setar • Kg. Gelugor Durian • Kg. Teluk Paku • Kg. Bilal Ali | <ul style="list-style-type: none"> • Short term exposure to increased high noise level from construction machineries in proximity. | <ul style="list-style-type: none"> • Operate equipment to minimise disruptive noise (e.g., banging, clattering). • Maximise separation between noise sources and receptors (50m+). • Provide sound absorbing materials for stationary equipment. • Route equipment away from sensitive areas. • Conduct noisy activities only during the day (7 am to 7 pm). • Avoid starting engine simultaneously and sequentially start equipment. • Replace noisy equipment with quieter alternatives. • Maintain equipment to reduce resonance and noise. |

Operation

| Receptors | Potential Impacts | Proposed Mitigation |
|--|--|--|
| <ul style="list-style-type: none"> • Kg. Gong Pipit • Kg. Pengkalan Setar • Kg. Gelugor Durian • Kg. Teluk Paku • Kg. Bilal Ali | <ul style="list-style-type: none"> • Noise level from increased traffic volume due to new road is expected but minimal. | <ul style="list-style-type: none"> • Establish buffer zones with landscaping or natural barriers to reduce noise exposure. • Implement traffic management measures such as speed limits or speed bumps near noise-sensitive areas. |

Potential Impacts & Proposed Mitigation Measures

Vibration

Construction

| Receptors | Potential Impacts | Proposed Mitigation |
|--|---|--|
| <ul style="list-style-type: none"> • Kg. Gong Pipit • Kg. Pengkalan Setar • Kg. Gelugor Durian • Kg. Teluk Paku • Kg. Bilal Ali | <ul style="list-style-type: none"> • Vibration from operating machineries during construction. | <ul style="list-style-type: none"> • Limit operating time of vibration sources and restrict activities. • Use lower impact equipment or methods. • Keep vibration sources away from sensitive areas. • Isolate equipment with resilient mounts or vibration dampers. • Sequence operations to avoid simultaneous high vibration activities. • Ensure proper equipment maintenance. • Increase distance between vibration source and receptors. • Use land use planning to create buffer zones between vibration sources and sensitive areas. • Investigate and correct causes of short-term vibration exceedance. |

Operation

| Receptors | Potential Impacts | Proposed Mitigation |
|--|--|---|
| <ul style="list-style-type: none"> • Kg. Gong Pipit • Kg. Pengkalan Setar • Kg. Gelugor Durian • Kg. Teluk Paku • Kg. Bilal Ali | <ul style="list-style-type: none"> • Vibration from increased traffic volume passby is minimal. | <ul style="list-style-type: none"> • No mitigation measures required as road designed to handle future traffic volume and vehicle composition. • Impact is minimal and within DOE vibration guidelines. |

Potential Impacts & Proposed Mitigation Measures

Waste Management

Construction

| Receptors | Potential Impacts | Proposed Mitigation |
|---|--|---|
| <ul style="list-style-type: none"> • Kg. Pengkalan Setar • Kg. Teluk Paku • Kg. Sg Derhaka • Kg. Gong Pipit • Kg. Kubang Durian • Kg. Bilal Ali | <ul style="list-style-type: none"> • Air Pollution: Risk from open burning of waste due to improper collection or disposal. • Water Pollution: Risk of spillage or leakage from improper waste handling and disposal affecting waterways and drainage. • Sedimentation & Soil Erosion: Potential clogging of waterways from earth stockpiles, increasing flood risks. • Pests & Health Risks: Neglected waste can attract pests, posing health and hygiene risks to nearby communities. • Transport Safety: Improperly secured materials and spills during transport pose safety risks to road users. | <ul style="list-style-type: none"> • Biomass Waste:- <ul style="list-style-type: none"> ➢ Reduce site clearing to ROW only and avoid large accumulation. ➢ Reuse materials like shredded branches as mulch, compost, or for erosion control. ➢ Transport biomass securely and avoid burning. • Construction Waste: <ul style="list-style-type: none"> ➢ Use precast materials, segregate waste, and recycle (e.g., concrete for base courses). ➢ Ensure proper storage to avoid leakage or spillage. • Domestic Waste: <ul style="list-style-type: none"> ➢ Segregate waste, minimise single-use items, and dispose of at designated landfills. • Scheduled Waste: <ul style="list-style-type: none"> ➢ Identify and store waste properly in labeled containers, transport to licensed facilities. ➢ Conduct regular waste inspections and use spill response kits. |



Example of SW Container

Operation

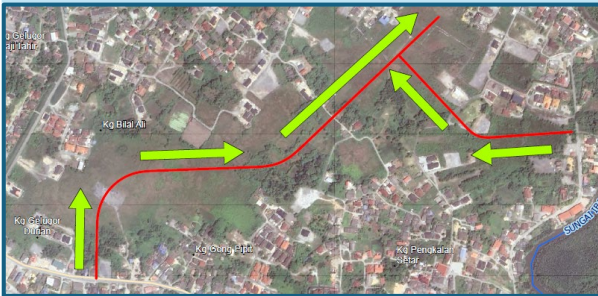
| Receptors | Potential Impacts | Proposed Mitigation |
|---|---|--|
| <ul style="list-style-type: none"> • Kg. Pengkalan Setar • Kg. Teluk Paku • Kg. Sg Derhaka • Kg. Gong Pipit • Kg. Kubang Durian • Kg. Bilal Ali | <ul style="list-style-type: none"> • Air Pollution: Illegal burning of garden waste (leaves, branches, etc.) from vegetation clearing. • Water Pollution: Improper handling and disposal of hazardous waste materials. • Littering: Improper handling of waste bags creates unsightly litter and potential road hazards. | <ul style="list-style-type: none"> • Use native species and low-maintenance plants to reduce trimming and pesticide use. • Use environmentally friendly, organic pesticides to minimise leachate. • Reduce plastic waste by using reusable containers or biodegradable bags for garden waste. • Appoint waste operator for disposal at composting facility. • Follow Environmental Quality (Scheduled Wastes) Regulations 2005. • Prepare a waste management schedule for proper disposal. • Segregate and responsibly dispose of hazardous waste (e.g., road furniture). • Recycle or reuse materials like aluminum and glass. • Transport scheduled waste with licensed contractors. • Use emergency spill kits for waste cleanup.- Keep records of waste generation and disposal. |

Potential Impacts & Proposed Mitigation Measures

Ecology

Construction

| Receptors | Potential Impacts | Proposed Mitigation |
|---|---|---|
| <ul style="list-style-type: none"> Abandoned agricultural land near Kg. Gong Pipit | <ul style="list-style-type: none"> Habitat loss and disturbances Habitat fragmentation Human-wildlife conflict | <ul style="list-style-type: none"> Systematic land clearing to minimize fragmentation. Use existing roads for access- Survey for active fauna nests. Implement wildlife safety measures (e.g., waste management). Translocate wildlife if needed. Educate workers on wildlife conservation and laws. |



Direction Suggested for Vegetation Removal During Land Clearing Process



Samples of The Traps for Macaques



Example Picture of Long-Tailed Macaque Foraging for Food from Trash

Operation

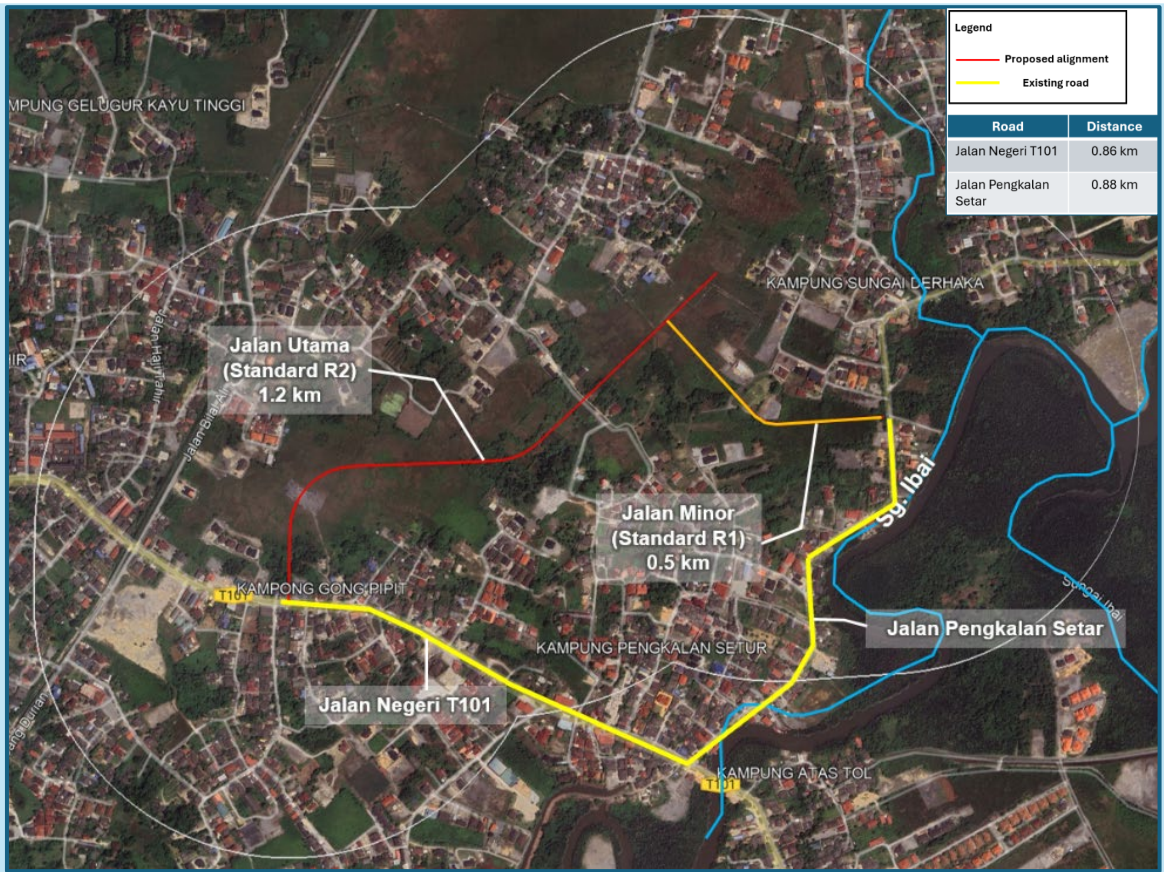
| Receptors | Potential Impacts | Proposed Mitigation |
|---|---|---|
| <ul style="list-style-type: none"> Abandoned agricultural land near Kg. Gong Pipit | <ul style="list-style-type: none"> Habitat fragmentation Wildlife roadkill Human-wildlife conflict | <ul style="list-style-type: none"> Provide wildlife hotline for incidents. Regular waste collection to discourage scavengers. |

Potential Impacts & Proposed Mitigation Measures

Traffic

Construction

| Receptors | Potential Impacts | Proposed Mitigation |
|--|---|---|
| <ul style="list-style-type: none"> Kg. Sg. Derhaka Jalan Pengkalan Setar Sg. Ibai Kg. Pengkalan Setar Kg. Gong Pipit Jalan Negeri T101 | <ul style="list-style-type: none"> Cause additional nuisance to the nearby residence as more heavy vehicles will be going in and out of the area Increased risk in vehicular incidents Potentially damage the existing road infrastructure | <ul style="list-style-type: none"> Limit entry/exit points to one each on Jalan Negeri T101 and Jalan Pengkalan Setar. Avoid material and waste transport during peak hours (7:00-8:00 am, 5:30-6:30 pm). Install warning signs and station flagman 100 m before entry/exit points. Brief construction drivers on speed limits during daily tool-box meetings. Develop a traffic management plan for rerouting and managing work zone traffic. |



Operation

| Receptors | Potential Impacts | Proposed Mitigation |
|---|---|--|
| <ul style="list-style-type: none"> Kg. Sg Derhaka Jalan Pengkalan Setar Kg. Pengkalan Setar Kg. Gong Pipit Jalan Negeri T101 | <ul style="list-style-type: none"> The traffic flow at Jalan Negeri T101 is expected to improve upon completion of the Project | <ul style="list-style-type: none"> Install traffic lights at JA1 intersection. Upgrade road geometry with additional exit lane at JA1. LOS at JA1 will improve to B (2026) and remain at B for 2036 and 2046 with upgrades. |

Potential Impacts & Proposed Mitigation Measures

Safety

Construction

| Receptors | Potential Impacts | Proposed Mitigation |
|--|--|---|
| <ul style="list-style-type: none"> Road users at Kg. Pengkalan Setar and Kg. Gong Pipit | <ul style="list-style-type: none"> Hazards from mobilisation and setup of construction machineries. Traffic disruption during construction activities causing hazards towards unaware road users Hazards from earthwork and site clearing activities. | <ul style="list-style-type: none"> Safe access/egress roads, safety barriers. Road signage, traffic flagmen, schedule vehicles. Inspect fasteners, provide guides, emergency response, first aid kits. PPE: Helmets, safety shoes, high-visibility vests. Inspection and removal of insect nests. Cordon hoisting area, use tag lines for lifting. Conduct Tool Box Talks, safety drills, and emergency response training. Ensure compliance with DOSH HIRARC guidelines. |

Operation

| Receptors | Potential Impacts | Proposed Mitigation |
|---|--|---|
| <ul style="list-style-type: none"> Road user at Kg. Pengkalan Setar and Kg. Gong Pipit | <ul style="list-style-type: none"> Minor increase in vehicle traffic at new junctions | <ul style="list-style-type: none"> Traffic management plans (speed limits, signal timings). Regular road inspections and timely maintenance. Emergency response plan for cargo-related accidents. Install clear signage, reflective markings, and streetlights. Use guard rails, manage trees/shrubs, and ensure proper drainage. Comply with JKR guideline ATJ 8/86. |

Potential Impacts & Proposed Mitigation Measures

Socio Economic

| Construction | | |
|---|--|--|
| Receptors | Potential Impacts | Proposed Mitigation |
| <ul style="list-style-type: none"> Kg. Gong Pipit, Kg. Pengkalan Setar and Kg. Kubang Durian Road users utilising the existing Jalan Negeri T101 at Kg Gong Pipit – Jalan Kuala Berang and Jalan Pengkalan Setar at Kg. Pengkalan Setar | <ul style="list-style-type: none"> The transportation of construction materials, machinery, and roadworks may cause nuisance to nearby residents and other road users due to noise, dust, and traffic congestion. | <ul style="list-style-type: none"> Communicate with stakeholders (Penghulu, JKKK) at least 3 months before construction. Set up communication platforms (WhatsApp/Telegram). Document, investigate, and address complaints from stakeholders. Ensure heavy vehicles adhere to speed/load limits. Place warning signs 150-200m before speed zones. Maintain local roads as per JKR/Local Authority standards (PBT). Implement traffic management plan to reduce accidents. Cover vehicles and use wash-down bays for dust control. Limit construction hours to 8 am - 6 pm (extensions need approval). Respond to complaints and implement dust/noise control measures. |
| Operation | | |
| Receptors | Potential Impacts | Proposed Mitigation |
| <ul style="list-style-type: none"> Kg. Gong Pipit, Kg. Pengkalan Setar and Kg. Kubang Durian Road users utilising the existing Jalan Negeri T101 at Kg Gong Pipit – Jalan Kuala Berang and Jalan Pengkalan Setar at Kg. Pengkalan Setar | <ul style="list-style-type: none"> The environmental nuisance is expected to improve upon completion of the Project Provide better accessibility and connectivity to the area benefiting local residents | <ul style="list-style-type: none"> Ensure road capacity can accommodate future traffic volumes. Monitor traffic flow to maintain satisfactory LOS (LOS D). Minimal noise impact due to sufficient distance from residential areas. Noise mitigation measures if required, such as sound barriers or quieter road surfaces. Keep local communities informed about the operational phase. Address concerns regarding traffic and noise regularly. |

Potential Impacts & Proposed Mitigation Measures

Flood

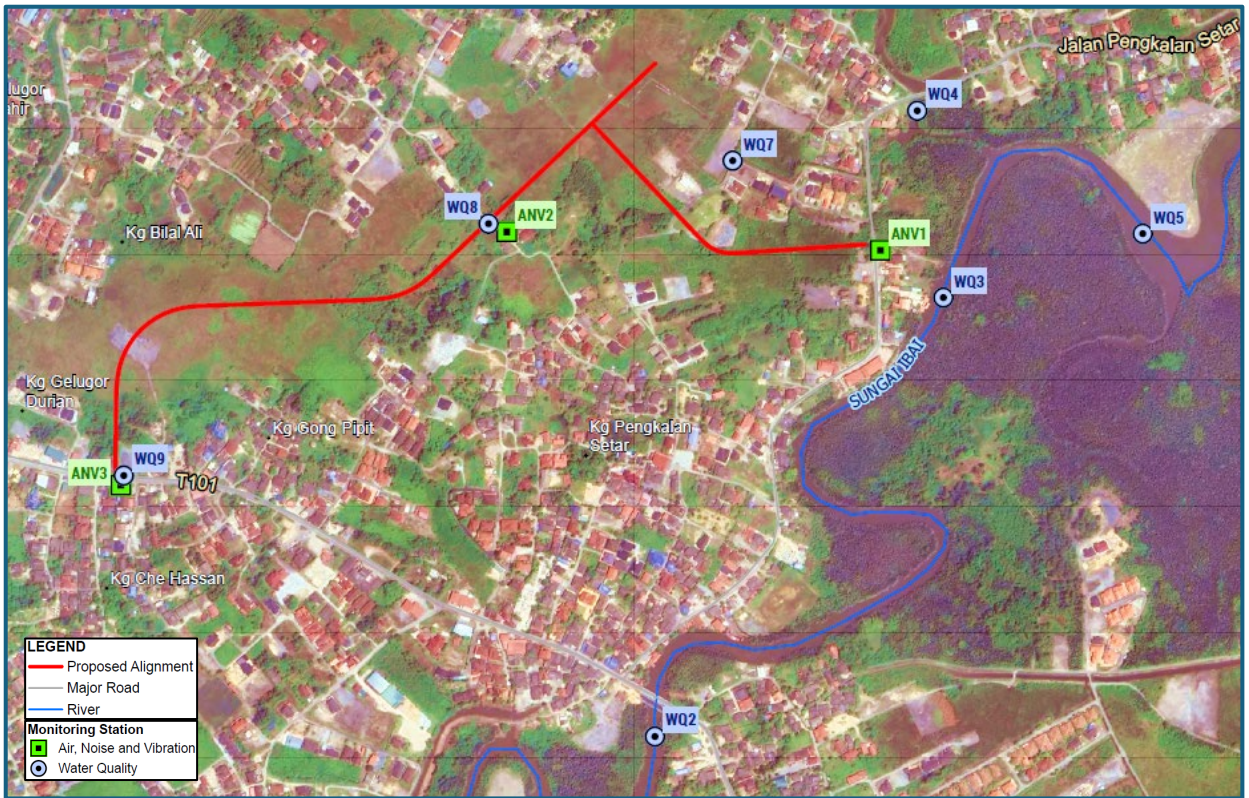
Construction

| Receptors | Potential Impacts | Proposed Mitigation |
|--|--|--|
| <ul style="list-style-type: none"> Vicinity of Project site | <ul style="list-style-type: none"> Blockage of drainage systems Reduced capacity of existing drainage system and waterways | <ul style="list-style-type: none"> Flood Risk Mitigation: Install culverts to prevent blockage and ensure proper drainage. BMPs: Implement Best Management Practices (BMPs) like slope protection, stabilisation of construction area, temporary drainage, silt traps, and wash troughs to prevent sedimentation. Maintenance Program: Regular inspections of BMPs, especially after rain, and during the northeast monsoon season. Inspect and maintain temporary earth drains, silt fences, and sediment traps. |

Operation

| Receptors | Potential Impacts | Proposed Mitigation |
|--|--|---|
| <ul style="list-style-type: none"> Vicinity of Project site | <ul style="list-style-type: none"> Flood risk is expected to be minimal with sufficient drainage system within the Project site | <ul style="list-style-type: none"> Drainage System Maintenance: Ensure proper drainage continuity by installing cross culverts to maintain water flow across embankments. Sizing of culverts will be based on hydraulic design for flood flows. Culvert Inspections: Regular inspections (routine, periodic, and event-driven) to check for damage, blockage, or sedimentation. This includes inspections after storms, heavy rain, or flooding. Culvert Maintenance: Periodic cleaning and repairs to remove debris, ensure proper flow, and prevent erosion. Emergency inspections and maintenance after severe weather. |

Proposed Environmental Monitoring During Construction



| Component | | Parameters | Monitoring Frequency |
|----------------------|--|--|----------------------|
| Water Quality | <p>Impact Monitoring All WQ points</p> <p>Performance monitoring All control measures (Silt trap, slope protection, etc.,)</p> <p>Impact monitoring Silt trap discharge point</p> | <ul style="list-style-type: none"> pH Temperature DO COD BOD TSS Turbidity NH₃-N Oil and Grease NO₂ Al Fe Faecal coliform count Total coliform count | Monthly |
| Air Quality | | <p>24-hr monitoring</p> <ul style="list-style-type: none"> PM₁₀ PM_{2.5} Sulphur Dioxide Nitrogen Dioxide <p>8-hr monitoring</p> <ul style="list-style-type: none"> Carbon Monoxide Ozone | Quarterly |
| Noise Level | <p>Impact monitoring All ANV points</p> | <p>24-hour monitoring</p> <ul style="list-style-type: none"> LA_{eq} L_{max} L_{min} L₉₀ L₁₀ | Quarterly |
| Vibration Level | | <p>Peak Particle Velocity</p> <ul style="list-style-type: none"> 24-hour monitoring and short term | Quarterly |
| Environmental Audits | | As required by DOE Terengganu | Every 4 months |