EXECUTIVE SUMMARY

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1 OVERVIEW

This Second Schedule Environmental Impact Assessment (EIA) has been prepared for the **Proposed Development of part of Distripark B (Phase 2) of Port of Tanjung Pelepas (PTP) in Tanjung Adang, Mukim Tanjung Kupang, Daerah Johor Bahru, Johor Darul Ta'zim** (hereinafter is referred to as the "Project") by Pelabuhan Tanjung Pelepas Sdn. Bhd. (referred to as "PTPSB" or "Project Proponent").

PTPSB holds 640.62 hectares (ha) (1,583 acres (ac)) of freezone land which is divided into five phases of development to support the container transhipment business. Out of the overall land area, a total of 256.98 ha of the area has been fully developed into Distripark A (Phase 1) and part of Distripark B (Phase 2). The other phases will be developed as and when demand arises in tandem with the expansion of the port's activities.

The Project which is located within Distripark B and, forms part of the Phase 2 expansion plan implemented by PTPSB will involve the development of 40.5 ha (100 ac) for light and medium industry and warehousing facility. Of this area, 50% which encompasses 20.25 ha (50 ac) will be reclaimed. The total volume of fill required is 1,300,000 m^3 of sand. The remaining area will be nominal fill at the designated platform level.

PTPSB anticipates the sand source may be obtained from Muar. The actual location will be decided by the land reclamation Contractor appointed by PTP.

Once developed, the Project will comprise four plots that will be leased to tenants for the development of light or medium industries. Such industries include those involved in warehousing and logistics.

1.1 Project Proponent

The Project will be developed by Pelabuhan Tanjung Pelepas Sdn.Bhd. Any enquiries can be directed to the following representative of the Proponent. The details of the Proponent are as follows;

Pelabuhan Tanjung Pelepas Sdn.Bhd.

Address	: Block A, Wisma PTP, Jalan Pelabuhan Tanjung Pelepas, TST 507, 81560, Gelang Patah, Johor
Telephone	: +607-504 2222
Fax	: +607-5042280
Contact Person	: En.Umar Faruq bin Jamaluddin
Designation	: Senior Manager, Project Integration Division
Email	: umarfaruq@ptp.com.my

1.2 Environmental Consultant

AGV Environment Sdn. Bhd. (AGV) has been appointed by Pelabuhan Tanjung Pelepas Sdn. Bhd. to prepare a First Schedule EIA for the Project. All questions pertaining to this document shall be directed to:

AGV Environment Sdn. Bhd. (1155709-T)

Address	:	100-06-035, Block J, 129 Offices, 46200 Petaling Jaya, Selangor Darul Ehsan
Telephone / Fax	:	03-7931 1455 / 03-7931 3512
Contact Person	:	Dr. Vijayalakshmi Samuel, Principle Consultant Ms. Tan Kim Fong, Principle Consultant
	:	Ms. Maria Violetta Thomas, Principle Consultant
Email	:	vijayalakshmi@agvenvironment.com kimfong.tan@agvenvironment.com maria@agvenvironment.com

1.3 Legal Requirement

Section 34A of the Environmental Quality Act 1974 (and its Amendment) requires any person intending to carry out a prescribed activity to submit a report on the impact on the environment to the Director General of the Department of Environment (DOE) for examination. The Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015 lists a set of prescribed activities that require the submission of an EIA to the Director General of the Environment for approval.

The proposed Project is a prescribed activity under the **First Schedule and Second Schedule** of the **Environmental Quality (Prescribed Activity) (Environmental Impact Assessment) Order 2015** based on the following activity:

Second Schedule

- Activity 7, Land Reclamation; (b) Coastal reclamation or land reclamation along river banks within or adjacent or near to environmentally sensitive areas.

First Schedule

- Activity 7, Land Reclamation: Coastal reclamation along river banks involving an area of less than 50 hectares
- Activity 17, Industrial Estate Development; (a) Development of industrial estate covering an area of 20 hectares or more

In compliance with the requirements, the revised TOR was submitted on the 15th of April 2020 and has been endorsed by DOE Putrajaya vide letter reference *JAS 600-2/7/5(20)* dated 06th of May 2020.

2 STATEMENT OF NEED

Port of Tanjung Pelepas is Malaysia's most advanced container terminal port situated in the state of Johor. The port commenced operations in October 1999 and was officially launched in 2000 and is one of the fastest-growing transhipment ports in the South East Asian region.

PTP started operations on 10th of October 1999 and was officially launched in 2000. Within its first 571 operations days, PTP handled 1 million twenty-foot equivalent units (TEU). In 2014, the port operation expansion increased to 12.5 million TEUs. Hence, PTP is one of the fastest Johor-South-East Asia's growing transhipment port.

PTP currently operates 14 berths at 5.04km length. The ports container yard located behind the berth with a total area of 1,800,000 sqm can cater for 12.5 million TEU's.

PTP holds 1,583 acres of Freezone land which is divided into five (5) phases of development. Out of the 1,583 acres, 635 has been fully developed into Distripark A and B. The two Distripark are currently 95% occupied.

Client of multi-national scale has approached PTPSB for a land parcel in order to develop its Regional Logistics Centre, which requires approximately 66 acres of the total development land (approximately 66% of the Project site).

The development at Tanjung Adang Bay forms an extension of Free Zone Phase 2 of the Free Zone area. PTP has decided to embark the Tg. Adang development first as it is more feasible to develop in terms of time and cost and can be readily leased to investors who have already expressed their interest in leasing the lots from PTP.

3 PROJECT OPTIONS

The aspects considered key to the developments have been deliberated for the Project Options especially in respect to attributes. The “Build-Out” option would entail the reclamation of the proposed Project and the establishment of fours plots which will be subleased to the potential tenant to build light to medium types industrial facilities such as warehousing and logistics involving regional procurement, consolidation, distribution and trading. This will complement and support the ongoing development within PTP and aligned with the vision promulgated by Flagship C, Iskandar Malaysia.

The “No-Build” Option assumes that the proposed Project is not implemented. The current industry within Distripark A and Distripark B will reach to a bottleneck. With the ongoing competition to strive for the best with Port of Tanjung Pelepas and its peers and the economic value this brings for the State of Johor, the implementation of the proposed Project is critical. Without the proposed Project, the economic stimulus envisaged for Iskandar Malaysia will be compromised.

Therefore, it is recommended that the proposed Project be implemented as proposed (Build Out Option).

4 PROJECT DESCRIPTION

4.1 Project Location

The Project site is located at the southern sector of the Distripark B on Lot D38, adjacent to the Straits of Johor. The nearest industrial facility bordering to the east of Project site are Mapletree Logistic Hub, Decathlon Logistics Malaysia Sdn. Bhd. and Onesubsea International (M) System. To the west of Project boundary is the port’s container yard and further west lies the operated berths of the port.

The main road, Jalan Skudai - Gelang Patah traverses 350 m north of the Project site boundary. The road network to the Project site is well developed, and the Project site is accessible via North-South Highway and Second Link Expressway. The nearest town from the Project site is Nusajaya town approximately 13.9 km east of the Project site and Kuala Lumpur, the country’s capital, is located 340 km north of the Project site.

The coordinates of the Project’s boundaries are presented in **Table ES 1.**

Table ES 1: Project Boundary Coordinates

Point	Coordinates	
	Longitude (N)	Latitude (E)
1	1°21'8.42"N	103°33'39.69"E
2	1°21'6.57"N	103°33'32.00"E
3	1°20'46.22"N	103°33'45.60"E
4	1°20'41.20"N	103°33'32.77"E

4.2 Project Concept

The proposed Project involves a total development area of 40.5 ha (100 ac) which includes 20.5 ha (50 ac) of coastal reclamation works. The remaining area will be nominal fill at the designated platform level. As the Project will also involve coastal reclamation works, an approximated total of 1,300,000 m^3 of sand is expected to be utilised in order to raise the area to the desired platform level of RL 5.0 m. The sand will primarily be river sand sourced from Muar and transported to the Project site via sea.

When completed, the proposed Project is expected to accommodate mainly light to medium industries such as warehousing and logistics activity that will complement the port's transhipment business. The proposed Project will only consist of infrastructural development which includes earthworks, roadworks, drainage, sewerage, water supply and power supply. Once developed, the Project site will be demarcated into four plots and leased to potential tenants to conduct their construction process.

4.2.1 Reclamation

PTPSB has decided to employ the hydraulic filling method as the reclamation methodology since it minimises impacts to the environment and is efficient from an operational point of view. The imported sand to be directly pumped to the Project site using a Trailer Suction Hopper Dredger (TSHD). Once the TSHD has reached the approved anchoring location, it will then pump the sand to the Project site through a discharge pipe.

The discharge pipe will be partially floating and partially located on land, behind the Phase 2 container Terminal. This pipe alignment is preferred because during the low tide, the pipe will not be able to remain afloat and will drop to the seabed. This alignment which avoids the seagrass bed in the adjacent area will ensure no damage is caused to the seagrass.

The rate of sand pumping typically depends on the size of the ship as well the pump. It typically takes about two hours to pump the sand from the haul to the Project site. A bigger TSHD will normally require less than two hours. It is also important to highlight that the time required for the TSHD to travel from Muar to PTP is estimated to be about a day. A two-way trip from Muar to the PTP and back to Muar will therefore require about two days. It is estimated that only single TSHD

will be use based on the area of the reclamation site. Actual number of TSHD will be confirmed by the land reclamation Contractor.

4.2.2 Project Development Activities

The Project will be developed based to the following stages:

1. Pre-construction phase
   - Involves various surveys, studies and investigation required for planning and engineering design for the project.

   - Activities undertaken during the pre-construction stage will include the following:

     - Soil investigation
     - Topographical survey, existing and proposed land use survey
     - Agencies Approval
     - Environmental baseline monitoring

2. Construction phase
   - Project construction is anticipated to be carried out based on the following:

     - Pre-reclamation works;
     - Reclamation works; and
     - Development on newly-reclaimed land

3. Operational phase
   -Once the proposed Project has completed its reclamation activity, the Project will comprise of multiple plots and PTP as the concession owner of the Port Facilities, will sublease the land to potential tenant to build facilities such as warehouses and industry.
   -Warehousing and logistics comprise of regional procurement, consolidation, distribution and trading centres.

4.3 Project Requirement

4.3.1 Roads

The Project site is accessible via internal road developed in Distripark B through Jalan DPB/3. An additional internal road network will be constructed to connect the existing Jalan DPB/3.

4.3.2 Drainage

The drainage system for the Project site is designed in accordance to the Urban Stormwater Management Manual for Malaysia (MSMA 2nd edition) Department of Irrigation and Drainage Malaysia, 2012. For the proposed Project, the catchment area considered within the design is based on 100 acres of land that will eventually be sub-divided into five plots. All the drainage water will be discharged directly to an existing culvert underneath Jalan DPB/6 which in turn is connected directly to Sg. Perpal. There are no drains discharged directly to the sea from the Project development.

4.3.3 Sewerage

The domestic wastewater for the Project (Plot 7,8,9 and 10) will be discharged gravitationally to a new sewerage pump station through a single sewer pipe network consisting of 250 mm diameter Ductile Iron (D.I) pipe and eight intermediate manholes, positioned not more than 100 m from each other. The new pump station is located south of the Project development at the corner of Plot 9.

From the new pump station, the domestic wastewater will be pumped via a force main to an existing pump station located north of the Project site that identified as PS9. Currently, PS9 is connected to an existing Sewage Treatment Plant (STP) located approximately 600 m on the east of the Project site.

4.3.4 Water Supply

Potable water supply will be sourced from the existing water tank located on the north of the Project site. The potable water demand for the Project when fully operated is estimated of 33,000 L/ha or 1,120,000 L/d.

4.3.5 Electricity Supply

It is estimated that the electricity supply requirement for the Project is 4.02 MW which will be supplied by Tenaga Nasional Berhad (TNB). Each plot in the Project site will be provided with individual substation.

4.3.6 Telecommunications

Telecommunication networks will be provided by Syarikat Telekom Malaysia Berhad (STMB). It is estimated six 100 mm diameter HDPE double wall corrugated pipes using Horizontal Directional Drilling over 490 m length are required to connect to an existing Telekom manhole located north from the Project site. It is important to note that the utility reserve is located within 40 m wide road reserve.

4.4 Project Implementation Schedule

The proposed development of the Project will be completed within approximately 47 months with the planned commencement in December 2019 and completion in July 2023. This timeline includes obtaining the necessary government approvals. The construction phase of the Project is expected to span over approximately 37 months.

5 EXISTING ENVIRONMENT

5.1 Topography

In general, the topography of the project site is flat and low lying. The existing finished earthwork platform is located 1.25 m above the Highest Astronomical Tide of +3.75mCD.

A soil investigation was conducted between January to February 2020 involving a total of 5 boreholes. Based on the findings of the borehole study, it can be concluded that the upper layers of the soil are mostly silt and sand with presence of clay and isolated presence of gravel. The lower layers however are primarily made of sand with occasional presence of silt.

5.2 Geology

The Project site is situated over marine and continental deposits from the Quaternary Period. These deposits are typically distributed in low-lying areas, especially along swamps and river banks.

Soil Investigation (SI) was carried out at five number of bore hole. All the borehole process has been terminated at average depth of 30 m and the water level recorded within the range of 0.4 m to 1.0 m

5.3 Climate and Meteorology

The Project site experiences an equatorial-monsoon climate, similar to the rest of the country with variations attributed to location difference, elevation as well as humidity and development progress. This form of climate is characterized by high average and uniform annual temperature, rainfall and humidity.

Climate data encompassing wind speed, temperature, rainfall and relative humidity for the site are sourced from the nearest Malaysia Meteorological Department (MMD) station at the station of Senai (1˚ 38’ N, 103˚ 40’ E) and the elevation is 97 m above mean sea level.

5.4 Hydrology and Hydrogeology

The Project site is located within the Sg.Pulai river basin that covers approximately 346 km^2 catchment area. The river originates from Gunung Pulai which rises to 630 m and drains into the Straits of Johore in the south west direction. The total length of Sg. Pulai from the river estuary to Gunung Pulai is approximately 41 km. The lowland areas are covered with permanent crops and Pontian and Gunung Pulai reservoirs are located at the upper portion of the basin.

Based on reconnaissance site visit conducted at the Project site, no streams, rivers or drain were observed within the site. Stormwater flows directly to the sea via ground surface or by seeping through the sandy soil platform. The Project lies within a region with high aquifer levels.

5.5 Flood Risk

Based on the Department of Irrigation and Drainage Malaysia, the types of flood in Malaysia are categories as seasonal, flash floods and tidal floods. Based on the Flood Prone Map in the National Physical Plan 3 (2015), the Project site is located within the flood-prone area.

5.6 Hydrography (Marine and Coastal Condition)

A comprehensive assessment of the existing coastal condition around Tanjung Adang was conducted. The relevant primary and secondary data collection has been conducted to further appreciate the coastal processes governing the surrounding of the Project site.

5.7 Terrestrial Ecology

The terrestrial ecology component is considered to be not significant as the Project site is located within a pre-existing industrial complex; with no land bridge connecting it to other forested areas in the vicinity. However, a small large patch of mangrove trees (*Avicennia marina*; Api-Api Jambu) are present along the shoreline of the Project site and the adjacent Kg. Tanjung Adang. Due to this, any terrestrial wildlife presence in the Project site are expected to be transient and not endemic in nature.

5.8 Land Use

The Project site is not considered as an ESA and has been gazetted for industrial area. However, within 6 km upstream in northwest direction of the Project site is Sungai Pulai Forest Reserve. The Sungai Pulai Forest Reserve is managed in line with Integrated Management Plan for the sustainable management of mangroves in the state of Johor by the Johor Forestry Department.

Generally, the Project site is predominantly by medium industries and port located within 5-km radius. In the immediate vicinity of Project Site is Kampung Tanjung Adang; located ~640m north-east.

5.9 Socio-Economy

Based on the the District of Johor Bharu and Kulai Local Plan 2025 (Replacement) *(Rancangan Tempatan Daerah Johor Bharu dan Kulai, 2025 (Penggantian)),* District of Johor Bharu and Kulai covers an area of 188,271 ha which consists of 10 Mukims. The Project site is located within Mukim Tanjung Kupang, being one of the mukim.

A Socio-economic assessment (SEA) was conducted amongst the local community residing in the surrounding areas, which comprises residential and institutional facilities to review the potential social effects of the proposed development. The approach of the socio-economic study is using Focus Group Discussion (FGD). Based on the socio-economic assessment conducted, it can be concluded the villagers were in favour of the proposed Project development.

5.10 Traffic

The road network to the Project site is well developed. From Kuala Lumpur (KL) and Johor Bahru, the Project site is assessible via North-South Expressway, Second Link Expressway (EXIT 313) and Lebuhraya Tanjung Pelepas.

5.11 Environmental Baseline Monitoring

A baseline monitoring program was conducted for the Project site on the 26th to 28 November 2019 encompassing of four (4) ambient air quality monitoring stations, four (4) noise monitoring stations, six (6) river water monitoring stations and four (4) marine water quality monitoring stations.

Air quality measured at all 4 locations, showed no exceedance for all parameters when compared against the limits of MAAQS 2020.

The noise level recorded at N1and N4 station are below the recommended limit for day time and night time. Noise level recorded at monitoring station N2 and N3 were higher than the recommended noise limit during day time and night time. Noise sources observed during daytime and night time were generally related to the vehicular movements

The surface water were tested for the parameters pH, temperature, DO, BOD_5,COD,TSS,O&G, ammoniacal nitrogen(AN), conductivity, salinity, Nitrate, phosphate, faecal coliform, total inorganic carbon and alkalinity. All parameters tested for the sample taken at all monitoring station were complied with the respective Class III limits except for Dissolved Oxygen which is slightly

higher than Class III recommended limit of 3 to 5 mg/L. Oil and grease level and phosphate were not detected in all samples.

The marine samples were taken for 3 consecutive days at 3 depth during low tide and high tide. The total marine sample taken is seventy-two (72) samples.

For low tide, the pH, ammonia, nitrate were recorded below the recommendation Class 3 limit. Dissolved oxygen for all samples were not within the Class III limit. For oil & grease and phosphate were not detected whilst the BOD level was recorded at below detection limit for all sample during low tide.

For high tide, the pH, nitrate, ammonia was recorded below the recommendation Class 3 limit. Dissolved Oxygen were recorded slightly higher than the Class 3 limit. For oil & grease and phosphate were not detected whilst the BOD level was recorded at below detection limit for all sample during high tide.

5.12 Marine Ecology, Fisheries and Aquaculture

An assessment of the marine ecology has been carried out for the Project site and the chosen sampling stations. The marine ecology comprises of biological productivity, habitat assessment, fisheries and aquaculture component.

6 EVALUATION OF IMPACTS

6.1 Coastal Hydraulic

The impact of the coastal subjected during construction and operational phase of the proposed reclamation Project can be assessed from the coastal hydraulic modelling. The coastal hydraulic modelling will be modelled based on six scenarios.

The assessment impacts are divided into five scope as below:

A. Hydrodynamic Impact Assessment

Overall, the impacts to the surrounding water level due to the development of the Project can be considered to be negligible and therefore requiring no mitigation plan.

Any changes in the flow current are mostly minimal and localised within 1.5 km from the Project site. As such, no mitigation measures are required.

B. Wave Impact Assessment

Overall, the proposed Tg. Adang reclamation will have negligible impacts to the surrounding environment. This is due to the location of the reclamation site itself in which is situated at the coastline and thus causing less obstructions to the propagating wave. As such, no mitigation measures are proposed.

C. Sediment Transport Impact Assessment

Overall, the Project is expected to have negligible impacts to the sediment transport regime within Johor Straits and thus no mitigation measures are required.

D. Flood Impact Assessment

Overall, the Project is expected to have insignificant impact to the surrounding water level during extreme flood events, mainly due to the fact that the Project site is located at the coastline and is not blocking the river mouths. As such, no mitigation measures are needed.

E. Sediment Plume Impact Assessment

Based on the model predictions (No Controlled Development-worst case scenario), it is observed that the sediment plume could travels up to 10 km from the Project area reaching notable areas such as the upstream of Sg Pulai (Sg Pulai RAMSAR site) and Tanjung Piai. This is very likely induced by the large tidal range within the region which had allowed the plume to travel greater distance during the ebb (i.e. towards Tanjung Piai) and flood (i.e. towards the upstream of Sg Pulai) tides.

For the Control Development, the overall water quality (TSS) across the region showed general improvement with the geotube (assuming a 90% efficiency) installed.

6.2 Air pollution

Air quality impacts are prevalent during reclamation activity such as fugitive dust emissions from transportation activities, as well as windblown dust generated from exposed surface generated within the construction site.

The main source of air quality impact during the operational phase is the vehicular movements due to transporting of goods and product to/from the industry and transport of personnel to workplace. The impacts to air pollution generation during operational is negligible.

6.3 Noise Generation and Vibration

During the construction phase, the boundary noise level is expected to increase due to operation of heavy machineries to transport construction equipment and materials. The noise level of the Project will also be generated from the site clearing activities, earthwork and foundation work which involves transportation of construction equipment and material.

In the operational phase, sources of noise will mainly be from the vehicular movements due to transporting of goods and product to/from the industry and transport of personnel to workplace. The impacts to noise generation during operational is negligible.

6.4 Soil Erosion and Sediment Risk

During construction phase, the potential impacts arising from site preparation activity which involved of land clearing, temporary access road construction, temporary drainage works and earthwork that will cause erosion and sedimentation.

During the operational phase, most of the exposed ground will be paved and sufficiently vegetated. Hence, the potential impact for erosion and sedimentation from the proposed Project will be negligible

6.5 Water Quality

During the construction phase, the main sources of water quality impacts are anticipated to site preparation works, construction runoff and on-site sanitary facilities. Temporary sanitary facilities provided on site during the construction phase will include potable chemical toilets or septic tanks that comply with the requirement of the Sewerage Services Department and IWK to avoid any untreated sewage discharged into Sg. Perpal or sea.

During the operational phase, the domestic wastewater from the Project will be channelized to the existing STP. Located approximately 600 m from the Project site. The effluent will be treated to meet the Standard B limits prescribed under the Environmental Quality (Sewage) Regulations, 2009.

6.6 Marine Navigation Traffic

Based on MRA conducted that include data processing, information collation, validation, hazard identification, risk analysis, area modelling and ship handling simulation, the proposed reclamation at the Project site will not posing any risk to any marine traffics and the environment in the area.

6.7 Flood Risk

The Project site is located within a flood-prone region and is facing the Straits of Johor. During the construction phase, temporary earth drains will be constructed along the perimeter of the Project site to effectively channel the surface runoff towards the silt trap.

During the operational phase, the project has been constructed and the open area will be turfed or paved with cement. An adequate size of permanent drain will be constructed and managed appropriately to avoid the occurrences of flash flood at the Project site.

6.8 Waste Management

During the construction phase, the proposed Project is expected to produce waste comprising of construction waste, municipal waste, vegetation waste and scheduled waste. Improper disposal of the waste is expected to cause of odour nuisance, attraction of pest and proliferation of diseases, blockage of waterways, aesthetics issues as well becoming potential fire hazards. During operational phase, municipal waste which includes office waste (paper, plastics) generated will be collected by a local waste collector hired by PTPSB and will be disposed at approved landfill sites.

6.9 Socio Economic Assessment

During the construction phase, job opportunities, particularly in the form of skilled and semi-skilled labour will be in demand. Preference should be given to local workers. During the operational phase of the Project, similarly, job opportunities particularly in the form of skilled and semiskilled labour will be in demand. This will offer job opportunity to the surrounding areas.

6.10 Ecology

During the construction period, the main environmental impacts on the marine ecology are describes as follow:

i) Loss of Mangroves due to Site Clearing
- The proposed Project will involve land clearing and filling of approximately 13.4 ha of mangroves

ii) Transportation of Fill Materials for Reclamation Purposes
- The fill materials from the TSHD vessel will be hydraulically pumped into the reclamation area (Project site) via a combination of two types of discharge pipelines (floating and onshore system.

iii) Impact on Marine Productivity
- The hydraulic study mainly impacts of sediment plume dispersion for the proposed Project development has been conducted to predict the impacts on marine productivity.

iv) Impact on Marine Habitats
- High sedimentation may impact the marine habitats. However, once the reclamation works are completed, the suspended sediment levels is expected to be reduced and be not significant.

v) Impact on Fisheries and Aquaculture
- Moderate impact is expected for fisheries activities surrounding the Port area particularly during the reclamation phase. However, once the reclamation works are completed, the suspended sediment levels is expected to be reduced and be not significant.

6.11 Land Traffic

A traffic impact assessment study was conducted for the proposed Project. The egress and ingress of the heavy vehicles may create safety hazards and will also contribute to pollution involving noise, smoke and vibration which will negatively impact the nearest receptors. However, it is important to note that most of the construction material will be transported by sea such as the TSHD. Once the proposed Project commences its operations, presence of heavy vehicles is expected to cease.

6.12 Public Safety

During the construction phase, mobilisation of construction machineries and construction material may impose safety hazards on road users. Movement of these vehicles on the roads are dependent on the construction schedule adopted for the development of the Project. During the operational phase of the Project, occupational hazards and risk to public are not an issue of concern for the Project.

6.13 Health Impact

During construction phase, vector bone disease such as malaria may be a concern due to the brackish water formation during reclamation activity. During the operational phase of the Project, health impact is not an issue of concern for the Project

7 MITIGATION MEASURES

7.1 Coastal Hydraulic

A. Sediment Plume Generation

During the construction phase of the Project, the proposed mitigation measures are as follows:

i) Installation of a single layer silt curtain at the Project area (SC1). Based on a model prediction, the combination of the geotube and silt curtain (SC1) located at the Project Area is expected to reduce the plume concentration at the nearby ESRs to within the allowable TSS limit stated in the MMWQS.
ii) To conduct TSS monitoring during the construction stage at several stations across the region.
iii) Following the model prediction, an optional of double layered silt curtain (SC2) is proposed to be installed between the seagrass and the Project Area. The installation of SC2 is subjected to the performance of the geotube and SC1 silt curtain in mitigating the plume generated from the Project site.
iv) A double layered silt curtain (SC3) will be installed between the seagrass and the TSHD anchor station to mitigate any potential plume generated at the anchor station.

B. Shoreline Monitoring Program

Shoreline Monitoring Program (SMP) is proposed to be conducted upon the approval of the Project. The purposed of the SMP is to detect and map the periodic changes of the existing shoreline/coastline and the seabed levels during the construction and post-construction stages.

C. Changes in Water Level and Current Speed

Overall, the hydrodynamic impacts (water level and current speed) subjected to the proposed reclamation was found to be negligible which requires no active mitigation measures to be planned.

D. Changes in Wave Height

Overall, the proposed Tanjung Adang reclamation will have negligible impact to the existing wave field and thus requires no active mitigation measures.

E. Changes in Total Sediment Transport

For all the scenarios tested, the sediment transport rate at the Project site was low (below 0.001 $m^3/s/m$) implying that the area could favor sedimentation which can promote the growth of mangrove in the future. Therefore, no active mitigation required.

F. Changes in Water Level during Extreme Hydrological Event (Flood)

The predicted changes in the water level subjected to the 100-year return period river discharge is found to be negligible; mainly founded based on the fact that the location of the proposed reclamation site does not block any river mouths. Hence, no active mitigation measures are required.

7.2 Air Quality

Deterioration of air quality is expected to be contributed by activities conducted during the site preparation and construction phase involving fugitive dust emissions from vehicular movements and from the removal of vegetation. Impact on air quality can be mitigated by applying the following measures:

- Watering of unpaved roads within the Project site;
- Provision of wash trough and wheel washing before exiting the Project site; and
- To implement Best Management Practices (BMPs) for control of fugitive.

During the operational phase, it is noted that most of the mitigation measures will be provided by the individual tenant (occupiers) of the industrial lots within the development area. The proposed mitigation will also be referred to Environmental Quality (Clean Air) Regulations 2014 (CAR 2014).

7.3 Noise and Vibration Generation

Reasonable effort will be made to minimize mainly the impact of noise resulting from the construction activities. During the operational phase, the mitigation measures to reduce the noise impact that may adopted are as follows:

- Identification of work areas with high noise, of 82 dB(A) or more.
- Implementation of noise control in those identified noisy areas as far as practicable.
- Use proper PPE such as ear mufflers or ear plugs when working with noisy machines

7.4 Soil Erosion

Overall, mitigation for erosion and sedimentation arising from the Project site will be in accordance with the ESCP and LD-P2M2. The perimeter controls are composed of BMP's that are utilized onsite which include the earth drain, sediment basin, earth dyke and sediment fence.

7.5 Water Quality

The main source of water impacts during the construction phase are related to soil erosion, sediment runoff and construction surface runoff. Mitigation measures will be taken during the site preparation and earthworks to ensure that carryover of sediment and loose materials to the receiving drains are minimised.

During operational phase, the main impact to water quality will be the domestic wastewater (sewage and sullage) from the future industrial area. The domestic wastewater will be conveyed to the existing STP located about 600 m on the east of the Project.The effluent discharged will be complying with the Standard B of the Environmental (Sewage) Regulations, 2009.

7.6 Marine Navigation Traffic

During the construction phase, the proposed mitigation measures for the management of marine traffic are comprises of temporarily relocate the PTP No.9 (Buoy), notify Marine Department on the project details and vessels master/owners will obtained permission from PTP Marine Services Division.

During the operational phase, there may potentially be an increase of the marine traffic due to the establishment of new industries within the Project site. The operators will comply to the requirements and standard of procedures of PTPSB.

7.7 Flood Risk

The Project site is located within a flood-prone area and is susceptible to flooding during seawater rises or during heavy rainfall season. The impact of the flood has been carried out using Delft3D. Based on the module finding, no significant impact was predicted. The drainage design for the Project development will be based upon the requirements of the *MSMA 2nd edition 2012*.

7.8 Waste Management

In managing the construction and municipal waste, proper housekeeping practices are to be implemented at all times, reduce, reuse and recycle will be practiced as far as practicable and regular collection and disposal of these waste will be conducted regularly and only in licensed landfills. The storage and disposal of scheduled wastes will be in accordance to the Environmental Quality (Scheduled Waste) Regulation, 2005.

During the operational phase, the municipal wastes will be collected by the contractors engaged by Port of Tanjung Pelepas Sdn.Bhd. (PTPSB).

7.9 Socio Economy

During construction phase, to prevent undue aberrations with the local community, the Contractor will ensure that the workers are registered with the Department of Immigration and the workers accommodation will be provided at an offsite location. Any complaint from the surrounding residents or community can be conveyed to the Corporate Communication Team (CCM) to ensure appropriate actions will be taken in timely manner .During operational phase, the good relationship with the local communities should be build.

7.10 Ecology

During the construction phase, geotube and single layer silt curtain and other infrastructure will be installed at the Project site, in line with the requirements of the ESCP prepared and LD-P2M2 to prevent sediments and other debris from being washed into the river. During operational phase, the water quality monitoring will be carried out.

7.11 Traffic

Impacts arising from increased traffic to and from the Project site during the construction and operational phase will be minimised by implementing the recommended mitigation measures which include imposing speed limits within 20 km/h to 40 km/h; transportation vehicles used will be well maintained and appropriate road signage will be erected at the Project site.

7.12 Public Safety

During construction phase, the proposed mitigation measures are including the following:

- Restriction and close supervision of the movement of construction vehicles in terms of timing and speed.
- Provide sufficient temporary signage at the Project site
- Provide flag man for traffic control when necessary
- Limit only one construction access

During the operational phase, public safety is not expected to be an issue as the Project site, and Port area as a whole, can only be accessed by authorised personnel as strict security measures regulating the movement of vehicles and personnel to and from the port are in force. Hence, no mitigation measures are deemed necessary.

7.13 Public Health

During the construction phase, the appointed Contractor will ensure that the workers are registered with the Department of Immigration and accommodation for the workers are provided

offside the Project site. During operational, the health impact is insignificant hence no mitigation measures is required.

8 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Effective management and monitoring of activities on the site are essential to ensure environmental objectives are achieved and in accordance to regulatory requirements and best management practices. The mechanism for ensuring that these mitigation measures are implemented and are effective is through implementation of an Environmental Management Plan (EMP). The element of self-regulation is to be incorporated in the EMP to enhance effectiveness in mitigating impacts.

The implementation of the mitigating measures is the responsibility of the parties concerned, namely the Project Proponent, Contractors and the appointed Environmental Officer (EO). The main elements of an effective EMP are regular environmental monitoring, periodic compliance audits, and an emergency response plan.

9 STUDY FINDINGS

The assessment of environmental impacts focuses on the key aspects, namely air pollution, noise generation, soil erosion, water quality and waste management. The potential impacts from these aspects were assessed to be minor due to the small scale of the development. The findings of this EIA show that with the implementation of all recommended pollution prevention and mitigation measures, and the adoption of Best Management Practises (BMPs), the proposed Project will not result in significant and adverse impacts to the surrounding environment.

SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATING MEASURES

Activities	Potential Impacts	Proposed Mitigating Measures
Coastal Hydraulic	Construction Phase - Sediment plume dispersion Operational Phase - Changes on the shoreline/coastline and seabed	Construction Phase -Installation of geotube and silt curtain -Periodic inspection and maintenance -TSS monitoring Operational Phase - Shoreline Monitoring Program
Air Quality	Construction Phase - Fugitive dust emission - Vehicular emission Operational Phase - Operational of the warehouse or light to medium industry	Construction Phase - Watering/dampening of unpaved/exposed surfaces - Washing of all outbound vehicles - Vehicle speed limit is 25 km/hr - Maintain good housekeeping Operational Phase - Comply with the requirement stipulated under Environmental Quality (Clean Air) Regulations 2014 (CAR 2014)
Noise Generation & Vibration	Construction Phase - Increased noise levels due to Project construction works - Minimal residual vibration Operational Phase - Noise will be generated from the operating of the warehouse or light to medium industry	Construction Phase - All machineries with intermittent use to be shut down between work periods - Erection of temporary metal hoarding around Project site - Provision of noise mufflers and periodical maintenance for all machineries used Operational Phase - Limit working hours for workers at noisy machines - Implementation of noise control in those identify areas - Use proper PPE
Soil Erosion	Construction Phase - Sedimentation and increased turbidity of receiving water body.	Construction Phase - Comply with the BMPs specifications and recommendations of the ESCP and LDP2M2

Activities	Potential Impacts	Proposed Mitigating Measures
Water Quality	Construction Phase - Contaminated surface runoff - Soil erosion and sediment Operational Phase - Effluent from STP - Surface runoff	Construction Phase - Compliance with measures proposed in the LD-P2M2 - Provision of adequate storage/containment facility with the relevant ERPs Operational Phase - Periodic in-plant water quality monitoring - Periodic inspection and maintenance of the mechanical equipment - Ensure all drainage system in good working condition
Marine Navigation Traffic	Construction Phase -Low risk on marine traffic and environment Operational Phase -Ship movement	Construction Phase - Temporarily relocated the PTP Buoy No.9 - Notify Marine Department on the Project details - Vessel master/owner will be obtained approval from PTP Marine Services Division Operational Phase - Comply with requirements and standard of procedures set by PTPSB
Flood Risk	Construction Phase -Flash flood Operational Phase -Flash flood	Construction Phase -Temporary earth drains and check dam will be constructed Operational Phase -Adequate size of drainage design
Waste Management	Construction phase (Domestic, vegetative, construction & scheduled waste) - Odour & aesthetic degradation - Attraction of disease-bearing vectors - Safety & fire issues Operational Phase (Domestic & sludge waste) - Odour & aesthetic degradation - Attraction of disease-bearing vectors - Safety & fire issues	Construction phase - Implement proper housekeeping practices - Reduce, reuse and recycle of materials as far as practicable - Conduct regular collection and disposal of generated waste to disposed at licensed landfills - Proper waste storage area equipped with spillage containment will be provided for the storage of scheduled waste - Disposal of scheduled waste generated will comply with the requirements of the Environmental Quality (scheduled Waste) Regulation 2005 Operational phase - Regular collection and disposal of domestic waste by the appointed contractor - Proper handling of the dried sludge generated

Activities	Potential Impacts	Proposed Mitigating Measures
Socio-Economy	Construction Phase - Social friction due to cultural difference between the foreign labour and the residents. - Spread of diseases	Construction Phase - Hiring of documented foreign workers with valid working permit - Mindful monitoring and management of foreign labour by contractor
Ecology	Construction Phase - Loss of mangroves - Transportation of fill materials - Impacts of marine productivity and habitats - Impacts on fisheries and aquaculture	Construction Phase - Installation of geoutube and single layer silt curtain - Installation of double layer silt curtain adjacent to the anchoring station - Monitoring the TSS level - Periodic inspection and maintenance of the silt curtain
Land Traffic	Construction Phase -Movement of trucks and construction vehicles	Construction Phase - Safety traffic signboards shall be displayed - Limit the speed of construction vehicles.
Health Impact	Construction Phase -Spread of vector disease	Construction Phase -Foreign workers will be registered with Department of Immigration