Chapter 2 Terms of Reference

2.1 Introduction

This chapter presents the summary of the Terms of Reference (TOR) which outlines the scope of EIA study for the proposed development of Kuantan Maritime Hub in Kuantan, Pahang. The TOR will ensure that the EIA study will be in line and could fulfil the latest Department of Environment's EIA Guidelines requirement which was issued in December 2016.

2.2 Summary of Terms of Reference

The proposed Project's TOR was endorsed by DOE Putrajaya on 22 March 2017 with letter referenced JAS 50/013/602/007(5) and appended as **Appendix 2.1**. The key aspects of the scope of the EIA study are described in the following sections.

2.2.1 Potential Key Environmental Impacts

Potential environmental impacts associated with the development of the proposed Project were identified and summarised as follows.

Table 2.2.1: Anticipated Potential Significant Environmental Impacts

Project Stage	Project Activities	Environmental Impacts
Reclamation / Dredging Stage	▪ Sand sourcing ▪ Preparatory works ▪ Sand filing works ▪ Soil treatment and settlement ▪ Shoreline protection ▪ Dredging works ▪ Waste Management	▪ Sediment plume / Water quality impact ▪ Marine ecology impact ▪ Change in hydraulics and hydrodynamics ▪ Fugitive air quality impact ▪ Construction noise impact ▪ Marine traffic ▪ Waste management ▪ Disturbance to fishing area ▪ Employment and business opportunities

Project Stage	Project Activities	Environmental Impacts
Land Works Construction Stage	▪ Transportation of construction material and equipment ▪ Foundation works – soil improvement, piling ▪ Civil and structure works – buildings, road and drainage ▪ Mechanical and electrical works ▪ Testing and commissioning ▪ Architecture finishing works ▪ Geotechnical works – surface protection	▪ Water quality impact ▪ Fugitive air quality impact ▪ Construction noise impact ▪ Land traffic ▪ Marine traffic ▪ Waste management Employment and business opportunities
Operation and Maintenance Stage	▪ Shipyard and fabrication yard operations ▪ Commercial and industrial activities at commercial and industrial plots ▪ Household activities at residential areas	▪ Water quality impact due to discharge of STP ▪ Potential oil and chemical spills ▪ Emission air quality impact ▪ Operation and traffic noise impact ▪ Land traffic ▪ Marine traffic ▪ Waste management ▪ Employment and business opportunities

The following sub-sections described the study boundary, assessment standards, assessment approaches and tools and possible mitigation measures.

2.2.2 Environmental Sensitive Area

During the initial site survey, several environmental sensitive areas (ESA) adjacent to the Project site were identified as mangroves, fishing aggregates devices (*tukun*), existing discharge points (including river and culverts) and nearby facilities such as residential and Kuantan Port (including its navigation channel and anchorage area). These ESAs are summarised in **Table 2.2.2.**

Table 2.2.2: List of Environmental Sensitive Areas (ESAs) adjacent to Proposed Project Site

Type of ESA		Approximate Distance from Project Site (km)	Direction
Mangroves	At estuary of Sg Pengorak	Immediate	North
Existing Discharge Point	Sg Pengorak	Immediate	North
	2 discharge culverts	Immediate	Northeast
	Sg Balok	3.3	Southwest
Facilities	Kuantan Port	0.2	Northeast
	LPK Apartment	0.1	North
	Kg. Selamat	0.1	North

Type of ESA		Approximate Distance from Project Site (km)	Direction
Fish Aggregates Devices	Tukun Darat	3	Southeast
	Tukun Pisang	7	Southeast

2.2.3 Marine Water Quality

Impacts on marine water quality are generally caused by the disturbance of soil and/or discharging of higher levels of physical, chemical or biological pollutants than that can be accommodated by the water body. Detrimental effect to the marine water quality can be because of sediment transport during reclamation, soil disturbance during dredging, lack of awareness, inappropriate site management, and the absence of adequate control measures, all of which can be prevented. Changes in water quality will not only impact the sensitive aquatic ecosystem, but also has the potential to have secondary impacts such as health due to contact with polluted water and loss of livelihood.

A review will be made on the proposed activities to be undertaken during the dredging and reclamation, construction and operation stages of the Project. Effluent from STP discharge is a potential source of water pollution during Project operation stage.

2.2.3.1 Study Boundaries

Water Quality

To gauge the existing marine water quality within and surrounding the proposed Project area, a baseline for marine water quality will be established with in-situ testing for some water parameters and analysis of grab samples taken from pre-identified water monitoring locations as described in **Table 2.2.3**. Water sampling at deeper area namely W1 to W5 and W10 shall be collected from three depths (surface, middle and bottom). Meanwhile one surface sampling will be conducted at shallower areas (W6-W9). The baseline sampling for marine water quality will be conducted during flood and ebb tides and over neap and spring tides.

Table 2.2.3: Proposed Baseline Water Quality Locations

Station	Approximate Coordinates	Justification
W1	3° 56' 2.24"N 103° 23' 5.62"E	Representing existing water quality near estuary where Sg Balok connects with the sea
W2	3° 57' 25.83"N 103° 26' 42.26"E	Representing existing water quality between Kuantan Port and Proposed Project site.
W3	3° 55' 25.57"N 103° 26' 54.95"E	Representing existing water quality at Proposed navigation channel further from Proposed Port
W4	3° 56' 28.09"N 103° 25 45.34"E	Representing existing water quality at Proposed navigation channel near to Proposed Port
W5	3° 57' 35.79"N 103° 24' 45.79"E	Representing existing water quality at Proposed Port's berth

Station	Approximate Coordinates	Justification
W6	3° 57' 25.46"N 103° 25' 42.11"E	Representing existing water quality at east boundary of Proposed Project site.
W7	3° 57' 57.09"N 103° 25' 6.68"E	Representing existing water quality at the culvert discharge from Kuantan Port drainage system.
W8	3° 58' 8.01"N 103° 24' 36.69"E	Representing existing water quality at the estuary of Sg Pengorak
W9	3° 57' 40.27"N 103° 24' 2.07"E	Representing existing water quality at west boundary of Proposed Project site.
W10	3° 56' 32.93"N 103° 23' 51.32"E	Representing existing water quality between Proposed Project site and Sg Balok estuary

Table 2.2.4: Proposed Test Parameters for Marine Water Quality

Parameters	Methods
Dissolved Oxygen *(in-situ)*	APHA 4500-O G, 2012
pH value *(in-situ)*	APHA 4500-H^+, 2012
Salinity *(in-situ)*	APHA 2520 B, 2012
Temperature *(in-situ)*	APHA 2550 B, 2012
Total Suspended Solid (TSS)	APHA 2540 D, 2012
Oil and Grease	APHA 5520 B, 2012
Tributyltin	In House Method
Polycyclic Aromatic Hydrocarbon (PAHs)	In House Method Based on YSEPA 3510C, Dec 1996 & In house Method 0534 Based on USEPA 8270 C, Dec 1996
Phosphate	APHA 4500-P D, 2012
Phenol	APHA 5530 C, 2012
Nitrite (NO_2)	APHA 4500-NO_2^- B , 2012
Nitrate (NO_3)	APHA 4500-NO_3^- E , 2012
Unionised Ammonia as (NH_3)	Calculation
Arsenic	APHA 2550 B, 2012
Cadmium	APHA 3125 B, 2012
Lead	APHA 3125 B, 2012
Cyanide	APHA 4500-CN^- C & F, 2012
Chromium (VI)	APHA 3500 Cr B, 2012
Zinc	APHA 3125 B, 2012
Mercury	APHA 3125 B, 2012
Copper	APHA 3125 B, 2012
Faecal coliform	APHA 9221 E, 2012
COD (W7 and W8 only)	APHA 5220 C, 2012
BOD (W7 and W8 only)	APHA 5210 B & 4500-O G B, 2012

Marine Sediment

The existing marine sediment quality will be determined to establish the baseline for this proposed Project. Sediment sampling is planned at 6 locations as shown in **Table 2.2.5** and required tests are presented in **Table 2.2.6**.

Table 2.2.5: Proposed Baseline Marine Sediment Locations

Station	Approximate Coordinates	Justification
S1	3° 56' 2.24"N 103° 23' 5.62"E	Representing existing sediment quality near estuary where Sg Balok connects with the sea
S2	3° 57' 25.83"N 103° 26' 42.26"E	Representing existing sediment quality between Kuantan Port and Proposed Project site.
S3	3° 55' 25.57"N 103° 26' 54.95"E	Representing existing sediment quality at Proposed navigation channel further from Proposed Port
S4	3° 56' 28.09"N 103° 25’ 45.34"E	Representing existing sediment quality at Proposed navigation channel near to Proposed Port
S5	3° 57' 35.79"N 103° 24' 45.79"E	Representing existing sediment quality at Proposed Port’s berth
S6	3° 57' 53.17" N 103° 24' 45.79"E	Representing existing sediment quality at Proposed Site

Table 2.2.6: Proposed Test Parameters for Sediment Quality

Parameters	Method
Lead	USEPA 200.2, Revision 2.8, EMMC V
Copper	USEPA 200.2, Revision 2.8, EMMC V
Zinc	USEPA 200.2, Revision 2.8, EMMC V
Nickel	USEPA 200.2, Revision 2.8, EMMC V
Cadmium	USEPA 200.2, Revision 2.8, EMMC V
Arsenic	USEPA 200.2, Revision 2.8, EMMC V
Mercury	In House Method Based on USEPA 200.2 & USEPA 245.5
Chromium	USEPA 200.2, Revision 2.8, EMMC V
Particle size distribution	In House Method Based on BS1377: Part 2:1990

Marine Ecology

The existing marine ecology and fishery resources are included in this EIA study to determine tolerance criteria associated with changes in water quality. Phytoplankton, zooplankton and macro benthos sampling are proposed at 6 locations as shown in **Table 2.2.7.**

Table 2.2.7: Proposed Baseline Marine Ecology Locations

Station	Approximate Coordinates	Justification
ME1	3° 56' 2.24"N 103° 23' 5.62"E	Representing existing marine ecology near estuary where Sungai Balok connects with the sea
ME2	3° 57' 25.83"N 103° 26' 42.26"E	Representing existing marine ecology between Kuantan Port and Proposed Project site.
ME3	3° 55' 25.57"N 103° 26' 54.95"E	Representing existing marine ecology at Proposed navigation channel further from Proposed Port
ME4	3° 56' 28.09"N 103° 25 45.34"E	Representing existing marine ecology at Proposed navigation channel near to Proposed Port
ME5	3° 57' 35.79"N 103° 24' 45.79"E	Representing existing marine ecology at Proposed Port's berth
ME6	3° 57' 53.17" N 103° 24' 45.79"E	Representing existing marine ecology at Proposed site

Meanwhile fishery resource study is planned at 2 areas to represent the resource at shallower and deep water area south of the proposed site.

2.2.3.2 Assessment Standards

Impact assessment on marine water quality will be based on Malaysia Marine Water Quality Criteria and Standard and Netherlands Standard for Water Sediments as well as additional tolerance criteria to be determined based on the results of the baseline surveys.

2.2.3.3 Description of modelling tools and assessment methodologies

Hydraulic modelling will be used as a tool to forecast the effects and zone of impact due to the Project implementation to the surrounding water body. The framework of models to be applied for the coastal, hydraulic and water quality modelling is the so-called MIKE models by DHI. The scope and methodology for this work shall be based on the requirements of the DID Guidelines for the Preparation of Coastal Engineering Hydraulic Study and Impact Assessment Fifth Edition, December 2001 (including the Additional Requirement dated June 2013). The numerical models will be calibrated using recent field data collected for a minimum 14-day period, and validated against other data collections. A full description of the data sets and the modelling set ups, calibration and model skill will be provided as appendices to the EIA report.

Spectral Wave Model (MIKE 21 SW)

2D spectral wave model (MIKE 21 SW) will be applied to transform offshore waves to the nearshore study area. MIKE 21 SW is a 3rd generation spectral wind-wave model that simulates the growth, decay and transformation of wind-generated waves and swells in offshore and coastal areas. The model includes wave growth by action of wind, non-linear wave-wave interaction, dissipation by white-

capping, dissipation by wave breaking, dissipation due to bottom friction, refraction due to depth variations, and wave-current interaction.

Reliable information on the wave climate at the site is probably the single most important factor in the quantification of the littoral drift and in establishing the sediment budget at the site. The local wave field are simulated for the following specific scenarios to evaluate the impacts on waves:

- Layout: The baseline layout (existing) as well as five (5) different development phases (i.e. Phase 1a, Phase 1b, Phase 1c, Phase 2 and Phase 3).
- The layouts are tested against the three (3) main climatic periods (i.e. North-East, South-West and Inter monsoon) each over a 30 days window with two spring tides.

Scenarios	North-East monsoon	South-West monsoon	Inter monsoon
Baseline	/	/	/
Phase 1a	/	/	/
Phase 1b	/	/	/
Phase 1c	/	/	/
Phase 2	/	/	/
Phase 3	/	/	/

It is noted that offshore wave data will be obtained from regional wave model covering the entire South China Sea resulting in the definition of the near-shore directional wave statistics and long-shore variations in wave energy at the site. The near-shore time series of waves obtained through the wave modelling for the coastal sediment transport modelling covers several consecutive years.

Hydrodynamic Model (MIKE 21 HD)

MIKE 21 HD are to provide the hydrodynamic basis for other MIKE 21 modules; including water quality and sediment plume modelling. MIKE HD simulates dynamically on a boundary fitted mesh the water level variations and flows in response to a variety of forcing functions and resolves both tidal, wind and wave-induced currents and associated flooding and drying.

A regional Hydrodynamic model has been set up to transfer tidal information to the local area using MIKE 21 HD. The model will provide detailed depth-averaged flow conditions at the project area. It is anticipated that a mesh size down to 25m will be used in the immediate vicinity of the site. The adopted grid size will be sufficiently fine to resolve the foreshore bathymetry, and the detailed channels and water fronts in the vicinity of the site. The detailed flow models will allow river flows and the important wave-driven currents to be encapsulated. The model will be set up, calibrated and validated for skill in accordance with the DID guidelines for numerical modelling studies. The scenarios to be simulated include:

- Layout: The baseline layout (existing) as well as five (5) different development phases (i.e. Phase 1a, Phase 1b, Phase 1c, Phase 2 and Phase 3).
- The layouts are tested against the three (3) main climatic periods (i.e. North-East, South-West and Inter monsoon) each over a 30 days window with two spring tides.

Scenarios	North-East monsoon	South-West monsoon	Inter monsoon
Baseline	/	/	/
Phase 1a	/	/	/
Phase 1b	/	/	/
Phase 1c	/	/	/
Phase 2	/	/	/
Phase 3	/	/	/

Sediment Transport Model (MIKE 21 ST)

The determination of the littoral drift is a key element for the description of the coastal and morphological stability and thus provides input to the evaluation of added erosion risks and project-induced sedimentation. The modelling of the transport will allow the determination of the yearly littoral transport conditions and historical trends at the study area. This requires a thorough understanding of the dominant physical processes. The description of the sediment transport can be carried out by applying the combination of DHI's one-dimensional LITPACK and fully two-dimensional intra-wave sediment transport model.

An overall sediment budget for the coastline adjacent to the study site will be carried out using the LITPACK model. The littoral drift results will be analysed and the most relevant wave events, or those conditions that largely contribute in the sediment transport, will be identified.

Once the relevant wave conditions have been determined, the detailed MIKE 21 ST is set up to resolve the 2D transport field for these representative conditions coinciding with a spring tide. The coastal sediment transport will be calculated in the local area of the hydraulic model set-up for the combined effect of waves and current forcing. The modelling will encapsulate the effect of the wind-, tidal- and wave-induced water levels and currents on the sediment transport patterns.

Retention Time Modelling (MIKE 21 AD)

The advection-dispersion module of MIKE 21 simulates the spreading of dissolved or suspended substances in an aquatic environment under the influence of wind, waves and tidal-induced flow and its associated dispersion. The substance may be regarded as a naturally buoyant pollutant, which may be treated as conservative or a substance decaying linearly. Examples of substances are salt, heat and the large variety of dissolved contaminants. To provide a conservative estimate of the retention time and the flushing capacity of local waters, substances to be considered are taken as conservative substances (i.e. non-decaying).

A local retention time analysis of substances discharged from the development and the sewage treatment plants (STPs) itself into the surrounding waters will be conducted based on DHI's MIKE 21 AD and the half time of the substance concentration in sensitive areas will be derived. The retention time model runs simultaneously with the hydrodynamic model and as an integral part of the

advection/dispersion modelling. To be conservative, only dry river scenarios are simulated in which the discharges in the river channels become equals the discharge from the STP's. This low-flow conditions imply i) low dispersion capacity and ii) non-diluted STP concentrations. The loading from the STP will be taken to be equal to the values in the Standard B as defined in Environmental Quality (Industrial Effluent) Regulation 2009. The scenarios to be simulated include:

- Layout: The baseline layout (existing) as well as five (5) different development phases (i.e. Phase 1a, Phase 1b, Phase 1c, Phase 2 and Phase 3).
- The layouts are tested against the three (3) main climatic periods (i.e. North-East, South-West and Inter monsoon).

Scenarios	North-East monsoon	South-West monsoon	Inter monsoon
Baseline	/	/	/
Phase 1a	/	/	/
Phase 1b	/	/	/
Phase 1c	/	/	/
Phase 2	/	/	/
Phase 3	/	/	/

Sediment plume model (MIKE 21 MT)

The MIKE 21 MT is used to describe the spread of released fine materials in association with proposed dredging and reclamation works. Factors to be considered in the modelling works include:

- Project development phases
- Type and number of dredgers
- Dredging method
- Production rates
- Characterization of dredged materials (composition of dredged material and material for reclamation)
- Seasonality in the hydraulic conditions

Based on the uncertainty of the project description in view of the dredging and reclamation works, and as the exact dredging and reclamation schedule will be often only be fully identified after the completion of the EIA, the assessment of sediment plume excursions will be based on upper-bound estimates of the production rates, sediments, hydraulic scenarios and associated spill rates. This will ensure a conservative assessment of the plume footprint and thus on the potential impacts arising from the temporary dredging and reclamation activities.

Scenarios	North-East monsoon	South-West monsoon	Inter monsoon
Phase 1a	/	/	/
Phase 1b	/	/	/
Phase 1c	/	/	/
Phase 2	/	/	/
Phase 3	/	/	/

2.2.3.4 Possible Mitigation Measures

Possible mitigation measures or best management practices from similar projects that may be used to address the marine water quality impacts of this Project is as follow:

- Installation of silt curtain at the work site
- Construction of perimeter bund to contain reclamation works within the Project area
- Periodical impact monitoring on water quality at identified sensitive receptors
- Periodical monitoring of marine ecology
- Performance monitoring of the STPs

More detailed and definite mitigation measures will be discussed in Chapter 7 of the EIA report.

2.2.4 Ambient Air Quality

Prediction of air quality impact is due to fugitive dust and gases emissions from vehicle exhausts and machineries during the construction and operational stage of the proposed Project. Potential impacts from fugitive dust are considered low, temporary and insignificant since the proposed site is located at sea front will have good dispersion effect.

2.2.4.1 Study Boundaries

Baseline for ambient air quality is planned at pre-identified sensitive receptors potentially to be affected by the proposed Project. 3 locations namely A1, A2 and A3 have been proposed as described in **Table 2.2.8** and the proposed test parameters are listed in **Table 2.2.9**.

Table 2.2.8: Proposed Baseline Air Quality Sampling Locations

Station	Approximate Coordinates	Justification
A1	3°58'5.21"N 103°24'52.53"	Representing existing ambient air quality at LPK Apartment
A2	3°58'7.16"N 103°24'22.86"E	Representing existing ambient air quality at surau of Kampung Selamat
A3	3°57'51.12"N 103°23'50.36" E	Representing existing ambient air quality at northwest corner of the Proposed Project location, nearby an existing reclaimed site

Table 2.2.9: Proposed Test Parameters for Ambient Air Quality

Parameters	Methodology
Particulate Matter 10 Micron (PM_{10})	AS/NZS 3580.9.6:2003
Particulate Matter 2.5 Micron ($PM_{2.5}$)	AS/NZS 3580.9.14:2003
Sulphur Dioxide	Methods of air sampling and analysis, 3rd Edition, Method 704A
Nitrogen Dioxide	Methods of air sampling and analysis, 3rd Edition, Method 818

2.2.4.2 Assessment Standards

Impact assessment on air quality will be based on the latest Malaysia Ambient Air Quality Standard as well as the established baseline data.

2.2.4.3 Description of modelling tools and assessment methodologies

The EIA study will review potential contributions from forecasted increased of land and marine traffics in the Project area and a qualitative assessment will be conducted to address associated air quality aspect. Potential receptors of any deterioration of air quality will be the workers / occupants at the Project site, residents at Kampung Selamat and LPK Apartment.

2.2.4.4 Possible Mitigation Measures

Possible mitigation measures or best management practices from similar projects that may be used to address the air quality impacts of this Project is as follow:

- Prohibit open burning at site
- Fuel burning equipment to be regularly maintained and serviced to prevent the emergence of dark smoke.
- Exposed site areas should be kept to the minimum required and completed areas should be hard surfaced/re-vegetated as soon as practicable.

2.2.5 Noise

Impact due to noise is an environmental concern during construction and operational stages of the Project. Noise generated during construction stage includes short-term use of construction machineries, pumps, compressors, generators, transportation trucks and other equipment. Construction of foundations for new structures would require piling works. During operational stage, noise from blasting works and steel works are anticipated. All these activities during construction stage could generate noise level as high as above 110 dB(A). Land traffic generated during development and operation stages will also contribute to the total noise levels in the surrounding.

2.2.5.1 Study Boundaries

Background environmental noise will be measured at 3 monitoring stations similar for ambient air quality and described in **Table 2.2.10**.

Table 2.2.10: Proposed Baseline Noise Measurement Locations

Station	Approximate Coordinates	Justification
N1	3°58'5.21"N 103°24'52.53"	Representing existing noise level at LPK Apartment
N2	3°58'7.16"N 103°24'22.86"E	Representing existing noise level at surau of Kampung Selamat
N3	3°57'51.12"N 103°23'50.36" E	Representing existing noise level at north west corner of the Proposed Project location, nearby an existing reclamation site

Noise measurements will be conducted once at each location using a calibrated sound level meter and continuously over 24 hours period to represent 15 hours (7 am to 10 pm) day time and 9 hours (10 pm to 7 am) night time. Noise parameters shall include L_{eq}, L_{max}, L_{min}, L_{10} and L_{90}. Extraneous and significant noise contributors observed during the monitoring sessions will be recorded.

2.2.5.2 Assessment Standards

Impact assessment on noise will be based on acceptance criteria established from review of baseline measured noise levels as well as the Planning Guidelines for Environmental Noise Limits and Control issued by DOE in 2007.

2.2.5.3 Description of modelling tools and assessment methodologies

Noise levels at a distance from source can be predicted based on the approach that noise emanating from a source will attenuate naturally as it propagates over free air. This is due to wave divergence, which results in dissipation of sound energy. The attenuation of noise can be estimated based on

information related to sound power level of the source and the distance over which the sound travels. Therefore, the propagation of a noise source measured at 1m away can be shown to behave to the following formula:

$L = L_0 - 20\ log_d$ (Point source)

$L = L_0 - 10 log_d$ (Line source)

Where,

L = Noise Level at d metres away from the source

L_0 = Noise Level measured at 1 meter away from the source

d = Distance from the point source in meters

Potential receptors will be the workers / occupants at the Project site, residents at Kampung Selamat and LPK Apartment. Established baseline will be reviewed to determine the noise acceptance criteria for this noise study.

2.2.5.4 Possible Mitigation Measures

Possible mitigation measures or best management practices from similar projects that may be used to address the noise level of this Project is as follow:

- Establish periodical maintenance schedule for all motorised machineries and equipment as preventive measure to minimise emission of loud noise. Attention shall be given to efficiency of mufflers to reduce noise problems.
- Enclosure or other type of acoustic measures shall be applied on equipment which contribute to noise levels higher than 85 dB(A).

2.2.6 Waste Management

Waste generated during development and operation stages of the Project will potential deteriorates the condition of the surrounding environment if they are not properly managed. Anticipated type of wastes to be generated from the Project is tabulated as **Table 2.2.11**.

Table 2.2.11: Anticipated Waste from the Project

Stage	Category	Type of Waste	Possible Source
Construction	Scheduled Waste	Ballast water-oil mixture (SW309)	Working barge, dredger
		Diesel and Oil spills (SW307)	Working barge, dredger
		Equipment with mineral oil (SW409)	Working barge, dredger, workers
		Rags or filters contaminated with scheduled waste (SW410)	Workshops/stockpile on site

Stage	Category	Type of Waste	Possible Source
	Solid Waste	Metal Scrap/ Construction material	Workshops/stockpile on site
	Domestic Waste	Sewage	Temporary sanitary facility on site
Operation	Scheduled Waste	Ballast water-oil mixture (SW309)	Barges, docks
		Diesel and Oil spills (SW307)	Barges, docks, workshops
		Equipment with mineral oil (SW409)	Docks, workshops
		Rags or filters contaminated with scheduled waste (SW410)	Workshops
		Waste of inks and paints (SW417)	Painting room, workshops
	Solid Waste	Metal Scrap	Workshops
	Domestic Waste	Sewage	Sanitary facility on site, sewage treatment plant

2.2.6.1 Study Boundaries

The study will cover wastes generated by the Project's activities both from onshore and offshore.

2.2.6.2 Assessment Standards

Impact assessment on waste management based on best management practises as well as latest Acts and Regulations.

2.2.6.3 Description of modelling tools and assessment methodologies

Estimation of wastes generation will be attempted using historical data and secondary references. Proposed waste management plans will be evaluated and documented in the EIA report.

2.2.6.4 Possible Mitigation Measures

Possible mitigation measures or best management practices from similar projects that may be used to address waste management for this Project are:

- Prevent and contain any spillage from machineries or vessel;
- All solid, liquid and scheduled wastes to be discharged on land using approved contractors; and
- Disposal of dredged material at approved dumping site only.