DEPARTMENT OF ENVIRONMENT
MINISTRY OF ENVIRONMENT AND WATER

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) GUIDELINE FOR AERODROME DEVELOPMENT

Department of Environment, Malaysia

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ACKNOWLEDGEMENT

The Department of Environment (DOE) would like to express our gratitude to all the Government Agencies (GAs), both at the Federal and State level, the Local Authorities, Planners, Developers, Consultants, stakeholders and Non-Governmental Organisations (NGOs) in providing their inputs and and incomparable assistance in developing the content of the Guidelines.

The Department is also grateful to all DOE staff for their efforts and passion in steering the Guidelines into reality for the benefits of streamlining and improving EIA reports preparation in the country.

Finally, DOE also hopes that the Guidelines will be used in the context of EQA 1974 for the betterment of Environmental Management in the country.

PREFACE

This **Environmental Impact Assessment Guideline for Aerodrome Development** is prepared in accordance with the requirements in the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015, of the Environmental Quality Act (EQA) 1974 (Act 127).

The guideline shall be read and referred together with the **Environmental Impact Assessment Guideline in Malaysia (EGIM) (DOE, 2016)**. Compliance with the requirements set out in this Guideline and the EGIM will fulfil the obligations of the Project Proponent as stated under section 34A (2C) of the EQA 1974.

The guideline is specifically prepared to guide the Project Proponent and EIA Consultant to prepare Environmental Impact Assessments (EIAs) for activities that is subjected to the prescribed activities listed in the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015.

The Department of Environment (DOE) is envisioning the EIA process to be more inclusive and more reflective of the scope, functions and visions of the Department in line with its on-going Environment Strategic Plan, with a focus on Environmental Mainstreaming Tools (EMT) to promote and achieve the multi-facet pillars of the Sustainable Development Goals (SDGs).

With the global context, commercial aviation is responsible for about 2% of global carbon emissions, a strong commitment is required from all stakeholders working together through the four pillars of the aviation industry strategy:

- Improved **technology**, including the deployment of sustainable low-carbon fuels
- More efficient aircraft **operations**
- **Infrastructure** improvements, including modernized air traffic management systems
- A single **global market-based measure**, to fill the remaining emissions gap

Proper planning in aerodrome development is crucial to minimize environmental risk and hazards particularly during its operation. Abatement and mitigation measures should be in place and efficient to minimize the adverse impact. Apart from this

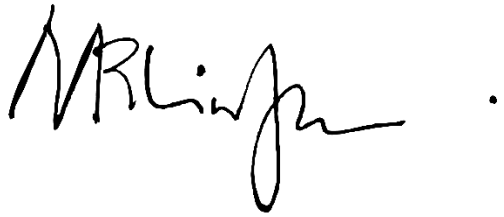
guideline, it is recommended that aviation operation to abide by International Civil Aviation Organization (ICAO) standards and guidelines in minimising its environmental risks.

Therefore, the Guideline emphasize the need to assess the impacts on the physical, social and biological environments within the zone of impact of the proposed aerodrome development as an integral part of the Environmental Assessment process. The development of aerodromes should adhere to the various requirements of all related stakeholder Agencies in order to ensure that they do not adversely affect the ecology or surrounding human environment. Effective and practical mitigating measures shall be put in place to minimise any adverse impacts on the local and global needs.

This Guideline is intended to be a reference tool and shall assist the Project Proponent and the EIA Consultant to identify appropriate stakeholders and Government Agencies to be engaged prior to carrying out the development. Stakeholders' engagement shall be an avenue to gauge their concerns, identify the main issues and to propose effective mitigating measures. The EIA process will provide adequate mechanisms to enable the general public and relevant stakeholder agencies access to contribute their views and comments. Their recommendations will be taken into account in the EIA and by the EIA Technical Review Committee (EIATRC). It is envisioned that with the holistic approach taken to address all stakeholder concerns, the vision of the Department of Environment: Environmental Conservation for the Well-being of the People can be realised.

The Guideline shall only be used within the framework of the EQA 1974 including its future updates, and its subsidiary regulations. It will be further updated as and when deemed necessary by the Director General of Environmental Quality.

The DOE wishes to express its appreciation to all users for using the Guideline in the spirit of ensuring compliance to the Environmental Quality Act 1974 and its subsidiary legislations.



(NORLIN BINTI JAAFAR)
Director General
Department of Environment

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TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

ABBREVIATIONS

AIs	Appointed Individuals
AN	Ammoniacal Nitrogen
APCS	Air Pollution Control Systems
BAT	Best Available Technologies
BATNEEC	Best Available Technology Not Entailing Excessive Costs
BMPs	Best Management Practices
BOD	Biochemical Oxygen Demand
BQ	Bill of Quantities
C&D	Construction and demolition
CAR	Corrective Action Report
CESA	Coastal Environmentally Sensitive Area
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CM	Compliance Monitoring
COA	Conditions of Approval
DG	Director General
DID	Department of Irrigation and Drainage/*Jabatan Pengairan dan Saliran*
DO	Dissolved Oxygen/Development Order
DOE	Department of Environment/*Jabatan Alam Sekitar*
DOF	Department of Fisheries/*Jabatan Perikanan*
DOSH	Department of Occupational Safety and Health/*Jabatan Keselamatan dan Kesihatan Pekerja*
EB	Environmental Budget
EC	Environmental Competency
EF	Environmental Facility
e.g.	Example
EGIM	Environmental Impact Assessment Guideline in Malaysia
EIA	Environmental Impact Assessment
EIATRC	Environmental Impact Assessment Technical Review Committee
EM	Environmental Mainstreaming
EMC	Environmental Monitoring Committee

EMCR	Environmental Monitoring Compliance Report
EMP	Environmental Management Plan
EMR	Environmental Monitoring Report
EMT	Environmental Mainstreaming Tools
EO	Environmental Officer
EP	Environmental Policy
EPD	Environmental Protection Department
EPMC	Environmental Performance Monitoring Committee
EQA	Environmental Quality Act
EQR	Environmental Quality Report
ERCMC	Environmental Regulatory Compliance Monitoring Committee
ERP	Emergency Response Plan
ESA	Environmentally Sensitive Areas
ESC	Erosion and Sediment Control
ESCP	Erosion and Sediment Control Plan
ESI	Environmental Scoping Information
ESM	Environmental Scoping Matrix
ET	Environmental Transparency
etc.	*Et cetera*
FGDs	Focus Group Discussions
FIA	Fisheries Impact Assessment
GAs	Government Agencies
GIS	Geographic Information System
GTM	Geological Terrain Mapping
HIA	Health Impact Assessment
HQ	Headquarters
HRA	Health Risk Assessment
i.e.	*id est*
ILO	International Labour Organisation

IM	Impact Monitoring
ISMP	Integrated Shoreline Management Plan
IWK	Indah Water Konsortium
JAKOA	*Jabatan Kemajuan Orang Asli Malaysia*
JKPTG	Department of Director General of Lands and Mines/*Jabatan Ketua Pengarah Tanah dan Galian*
JKR	Public Works Department/*Jabatan Kerja Raya*
JMG	Minerals and Geoscience Department/*Jabatan Mineral dan Geosains*
JPSM	Forestry Department of Peninsular Malaysia/*Jabatan Perhutanan Semenanjung Malaysia*
JPSPN	National Solid Waste Management Department/*Jabatan Pengurusan Sisa Pepejal Negara*
KD	*Kemampanan Spatial dan Daya Tahan Terhadap Perubahan Iklim*
KASA	Ministry of Environment and Water/*Kementerian Alam Sekitar dan Air*
KPKT	Ministry of Urban Wellbeing, Housing and Local Government/*Kementerian Perumahan dan Kerajaan Tempatan*
KSAS	*Kawasan Sensitif Alam Sekitar*
LCP	*Laporan Cadangan Pemajuan*
LD-P2M2	Land Disturbing Pollution Prevention and Mitigation Measures
LOS	Level of Service
METMalaysia	Malaysian Meteorological Department/*Jabatan Meteorologi Malaysia*
MMWQCS	Malaysia Marine Water Quality Criteria and Standard
MOH	Ministry of Health/*Kementerian Kesihatan Malaysia*
MOM	Minutes of Meeting
MOT	Ministry of Transport Malaysia
MPFN	National Physical Planning Council/*Majlis Perancang Fizikal Negara*
MSL	Mean Sea Level
MSMA-2	*Manual Saliran Mesra Alam Edisi-2*

MUSLE	Modified Universal Soil Loss Equation
MWQI	Marine Water Quality Index
NGOs	Non-governmental Organisations
NLC	National Land Code
NPCZP	National Physical Coastal Zone Plan
NPP-CZ	National Physical Plan-Coastal Zone
NPP-2	National Physical Plan-2
NPP-3	National Physical Plan-3
NREB	National Resources and Environment Board
NTU	Nephelometric Turbidity Units
NWQS	National Water Quality Standards of Malaysia
O&G	Oil and Grease
OSC	One-Stop Centre
PE	Population Equivalent
P2M2	Pollution Prevention and Mitigation Measures
PBT	Local Authorities/ *Pihak Berkuasa Tempatan*
PD	*Pertumbuhan Dinamik Bandar dan Luar Bandar*
PERHILITAN	Department of Wildlife and National Parks Peninsular/*Jabatan Perlindungan Hidupan Liar dan Taman Negara (PERHILITAN) Semenanjung Malaysia*
PLANMalaysia	Department of Town and Country Planning/ *Jabatan Perancangan Bandar dan Desa*
PM	Performance Monitoring
PM10	Particulate Matter 10 micrometres or less in diameter
PM2.5	Particulate Matter 2.5 micrometres or less in diameter
PSZ	Public Safety Zone
PPV	Peak Particle Velocity
PTD	Land and District Office/ *Pejabat Tanah dan Daerah*
PTG	Land and Minerals Office/ *Pejabat Tanah dan Galian*
PVD	Prefabricated Vertical Drain System
Q&A	Questions and Answers
RAC	Report Adequacy Check
RFZPPN	*Rancangan Fizikal Zon Persisiran Pantai Negara*
ROW	Right of Way
RUSLE	Revised Universal Soil Loss Equation

SAMM	*Skim Akreditasi Makmal Malaysia*
SAP	Special Area Plans
SI	Soil Investigation
SIA	Social Impact Assessment
SIDRA	Signalised and Unsignalised Intersection Design and Research
SMA	Special Management Areas
SPAN	National Water Commission of Malaysia/ *Suruhanjaya Perkhidmatan Air Negara*
SPC	State Planning Committee
SR	Self-Regulation
SS	Suspended Solids
SSA	Site Sustainability Assessment
STP	Sewage Treatment Plant
STS	Sewage Treatment Systems
SWMM	Storm Water Management Model
TCPA	Town and Country Planning Act
TIA	Traffic Impact Assessment
TNB	Tenaga Nasional Berhad
TOC	Table of Contents
TOR	Terms of Reference
TORAC	Terms of Reference Adequacy Check
TRC	Technical Review Committee
TSS	Total Suspended Solids
UNEP	United Nations Environment Programme
UPEN	State Economic Planning Unit/Unit Perancang Ekonomi Negeri
WIPs	Water Intake Points
WQI	Water Quality Index
WTP	Water Treatment Plants
WWF	World Wildlife Fund for Nature
ZOI	Zone of Impact
ZOS	Zone of Study

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PREAMBLE: GUIDELINE OVERVIEW

CHAPTER 1: Introduction

FIRST SCHEDULE ACTIVITY 2: AERODROME
Expansion of an aerodrome involving a runway of 1,000 meters or longer

SECOND SCHEDULE ACTIVITY 2: AERODROME

(a) Construction of a new aerodrome involving a runway of 1,000 metres or longer.

(b) Construction of aerodrome in or adjacent or near to any state park, national park, national marine park, island surrounding marine park or environmentally sensitive area.

CHAPTER 2: Environmental Project Planning

- Terms and Definitions
- Policy and Guideline Compliance
- Stakeholder Engagement

CHAPTER 3: Approach & Methodology

SCENARIOS FOR EIA SCREENING	First Schedule Activity 2	Second Schedule Activity 2(a)	Second Schedule Activity 2(b)
Extension of runway only >1,000m long	✓	✗	✗
Total extension and existing runway is > 1,000 metres in length	✓	✗	✗
Expansion of aerodrome near or adjacent to ESAs not involving runway extension	✗	✗	✗
Airport expansion of building within the gazetted area which increases the number of population ≥ 20,000 PE	✓	✗	✗

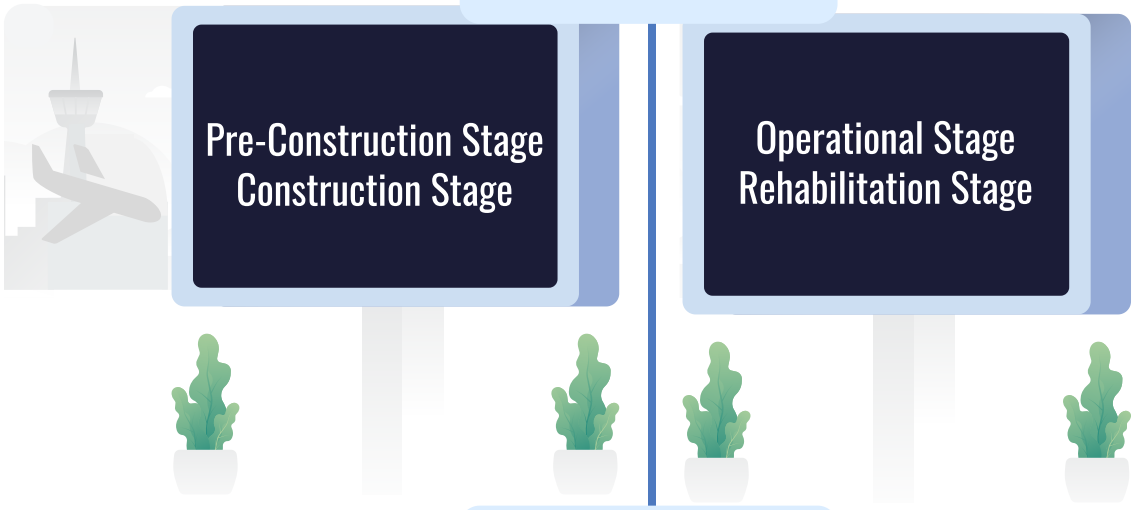
CHAPTER 4: Baseline Data

Baseline data collection shall cover 3 major environmental components:

- Physico-chemical environment
- Biological environment
- Socio-economic environment

CHAPTER 5 & 6: EVALUATION OF IMPACTS & MITIGATION MEASURES

ACTIVITIES



IMPACTS

MITIGATION MEASURES

- LD-P2M2
- P2M2

CHAPTER 7: Environmental Management Plan

- Performance Monitoring (PM)
- Compliance Monitoring (CM)
- Impact Monitoring (IM)

CHAPTER 8: Reporting & Review

SUBMISSION & REVIEW PROCESS

FIRST SCHEDULE ACTIVITIES

- Submission to DOE State Office
- 3 hard copies + 1 soft copy (CD) to State DOE + 1 distribution by soft-copy (CD) to agency/AI/NGOs for comment
- Public display not required

SECOND SCHEDULE ACTIVITIES

- Submission to DOE HQ
- 3 hard copies + 1 soft copy (CD) to relevant State DOEs + 1 distribution by soft-copy (CD) to agency/AI/NGOs for comment
- Public display required

1 INTRODUCTION

The guideline shall be entitled Environmental Impact Assessment (EIA) Guideline for Aerodrome Development (hereinafter referred to as the 'Guideline') is prepared to take into account the latest requirements in the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015, of the Environmental Quality Act (EQA) 1974 (Act 127).

The Environmental Quality (Prescribed Activities)(Environmental Impact Assessment) Order 2015 came into force on 28th August 2015, which is now divided into;

1. **First Schedule (21 Prescribed Activities)**
2. Second Schedule (17 Prescribed Activities)

- The Guideline for Aerodrome Development shall be read and referred to together with the Environmental Impact Assessment Guideline in Malaysia (EGIM) (DOE, 2016).
- Compliance with the requirements set out in this Guideline and the EGIM will fulfil the obligations of the Project Proponent as stated under Section 34A (2C) of the EQA 1974. The legal adherence is based on sub-sections of the EQA 1974 (as of 5th February 2015), as follows:

SECTION 34A (1)

The Minister, after consultation with the Council, may by order prescribe any activity which may have significant environmental impacts as prescribed activity.

SECTION 34A (2)

Any person intending to carry out any prescribed activity shall appoint a qualified person to conduct an environmental impact assessment and to submit a report thereof to the Director General in the manner as the Director General may prescribe.

SECTION 34A (2A)

The Director General shall maintain a list of qualified persons who may carry out an environmental impact assessment and submit a report thereof.

SECTION 34A (2B)

The qualified person who submits the report shall—

(a) be responsible for the environmental impact assessment and the recommendations of the environmental impact assessment;
(b) ensure that the report and the recommendation do not contain any false or misleading information;
(c) take a professional indemnity insurance for any liability arising from the environmental assessment and the recommendations of the environmental impact assessment.

EIA DEVELOPMENT

The EIA process entails studies to identify, predict, evaluate and quantify the impacts (both beneficial and adverse) on the environment of a proposed project or development and to communicate the said information to those concerned.

The benefit of having an EIA is to facilitate decision-making for both the DOE and the Local Authorities from an environmental perspective.

The EIA report shall also assist the stakeholders including the Project Proponent in identifying the significant environmental impacts; appropriate abatement and mitigating measures; programmes for monitoring environmental compliance; within the development plan prior to and/or during project implementation.

OBJECTIVES of the GUIDELINE

GUIDANCE

Provide clear and concise guidance on EIA project planning and preparation to the stakeholders, Project Proponents, Qualified Persons (i.e. DOE-registered Environmental Consultants), Government Agencies (GAs), Enforcement Officers and other project-related practitioners.

SCOPE

Clearly define the scope of the EIA with a focus on the significant environmental issues relevant to the DOE's functional areas, whilst also taking into consideration the environmental requirements by other authorities or agencies, to facilitate overall decision-making and project approval.

PROCEDURE

To integrate and establish procedures to aid in evaluation for implementation of EIA studies involving Transportation and Road projects in Malaysia.

FRAMEWORK

Provide a clear framework for DOE to assess and approve the EIA report.

INTEGRATION

Facilitate integration of the EIA into the overall project planning and development cycle in order to ensure compliance with and adherence to the legal environmental requirements within the framework on environmental sustainability.

UNDERSTANDING

To provide an understanding of the EIA procedures, preparation, and submission of the EIA Report for review and approval

STEP-BY-STEP GUIDANCE

Provide a detailed step-by-step guidance with explanation of the various EIA procedures and submissions, comprising of:

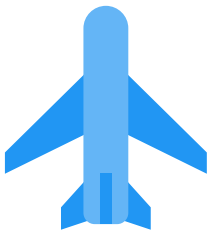
i. Environmental Scoping Information (ESI)
ii. Terms of Reference (TOR)

REQUIREMENTS

Provide mandatory requirements for environmentally acceptable Aerodrome development allowed by the authority within its jurisdiction.

APPLICABILITY OF THE GUIDELINE

The proposed guidelines are specifically prepared to guide the Qualified Person or Project Proponent to prepare an Environmental Impact Assessment (EIA) and EIA reporting for Aerodromes that is subjected to the following prescribed activities listed in the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015:



FIRST SCHEDULE ACTIVITY 2: AERODROME

Expansion of an aerodrome involving a runway of 1,000 meters or longer

SECOND SCHEDULE ACTIVITY 2: AERODROME

(a) Construction of a new aerodrome involving a runway of 1,000 metres or longer.

(b) Construction of aerodrome in or adjacent or near to any state park, national park, national marine park, island surrounding marine park or environmentally sensitive area.

For a project that involves more than one prescribed activity, the EIA shall incorporate all key issues inherent in the relevant prescribed activities of the project. If one of them falls under the Second Schedule, then the project is deemed to fall under the requirements of the Second Schedule.

This guideline is applicable for projects involving on both landward and/or sea and the relevant studies involved is as shown tabulated in Chapter 3.

The prescribed activities mentioned above **shall be applicable** to the State of Sabah and Sarawak, although both states are subjected to separate state legislations and requirements as shown in the table below.

STATE	LEGISLATION	AUTHORITY
	Environment Protection Enactment (Prescribed Activities) (Environmental Impact Assessment) Order, 2005	Environment Protection Department (EPD)
	Natural Resource and Environment Ordinance (Prescribed Activities) Order, 1994	Natural Resource and Environment Board (NREB)

OVERVIEW of the ENVIRONMENTAL ASSESSMENT PROCESS

PROVIDE PROJECT BRIEF 1

The Project Proponent must provide basic information to enable the Qualified Person to understand and carry out an initial assessment.

This is to assist in determining which Prescribed Activity and Schedule of the project falls under based on the Environmental Quality (Prescribed Activity) (Environmental Impact Assessment) Order 2015.

CHECK IF THE PROJECT IS ALIGNED TO EXISTING POLICIES 3

The Project Proponent is required to check if project is aligned to existing policies and clear all policy matters related to the project prior submitting the EIA report.

TOR & ESI PREPARATION 5

Upon determining that the project requires an EIA, the Environmental Scoping Information (ESI) and Terms of Reference (TOR) must be prepared.

The Qualified Person shall obtain secondary data to assist in the Environmental Scoping. At this point of the study, qualitative data is sufficient for scoping of significant impacts for the TOR.

Relevant information required for the TOR that the Qualified Person is required to furnish includes:

- Site Suitability Assessment (SSA)
- Determination of the study boundary
- Overview of baseline data
- Identification of key project activities
- Identification of significant impacts and priority setting

IDENTIFY LEGAL REQUIREMENTS 2

During the Environmental Screening Process, the Qualified Person shall identify the legal requirements of the project based on the information provided by the Project Proponent.

CARRY OUT PRELIMINARY STAKEHOLDER ENGAGEMENT 4

Early on in the EIA process, the Project Proponent and the Qualified Person shall engage with the DOE (via the designated officer in charge) and the relevant Government Agencies (GAs) to determine the requirements to be included in the TOR.

The Qualified Person can also engage with other relevant stakeholders to obtain site information and data for the scoping.

PREPARATION & SUBMISSION OF TOR 6

The Qualified Person shall review all data obtained during scoping to prepare the TOR report based on DOE requirements in the EGIM (DOE, 2016). The report shall be submitted to DOE for review and endorsement.

BASELINE DATA COLLECTION FOR EIA 7

After the TOR endorsement, baseline data collection, primary and secondary data, shall be carried out to obtain detailed information of the existing environment of the project site and its surroundings.

OVERVIEW of the ENVIRONMENTAL ASSESSMENT PROCESS

COMPLETION OF EIA REPORT 8

The major studies and components of the EIA report shall cover the following:

- Identify & predict the significant environmental issues & impacts
- Carry out detailed environmental assessment on the most significant issues but still addressing the less significant issues
- Identify suitable pollution prevention & mitigation measures (P2M2s) to minimize any negative impacts arising from the development of the projects
- Provide the EMP framework in line with the Self-Regulation concept

* Details can be referred to in Chapters 5 – 7.

PUBLIC ENGAGEMENT 10

Upon completing of the Draft EIA report, the Project Proponent and Qualified Person shall undertake an engagement with the relevant stakeholders (those who will be affected by the project e.g. community or institutions, businesses etc.)

The objective is to brief these stakeholders about the project, what it entails, the potential environmental issues and the proposed P2M2s, with the aim to seek their thoughts and feedback. All findings from the public engagement shall be incorporated into the final EIA report

DRAFT EIA REPORT 9

All assessments and findings must be included in the EIA report. Take note that the results of studies required by other GAs must be incorporated into the report but not to append the individual reports. These reports must however be submitted to the respective GAs for the soonest review.

The format of the EIA report is detailed in Chapter 8.

EIA SUBMISSION 11

The EIA report shall be submitted to DOE State/HQ for review.

EIA REPORT EVALUATION 12

The EIA report shall be evaluated by DOE State/HQ prior to approval.

EIA REPORT APPROVAL 13

EIA report is approved with approval conditions.

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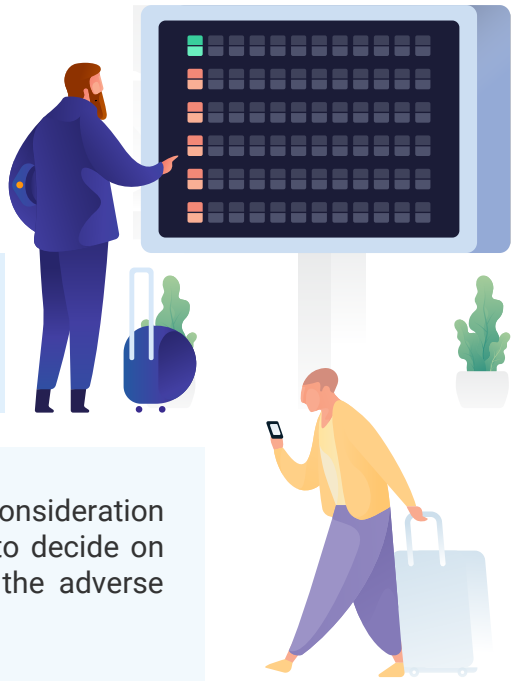
2 ENVIRONMENTAL PROJECT PLANNING

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

EIA is an integral part of the overall integrated project planning, which can provide benefits and value to any project

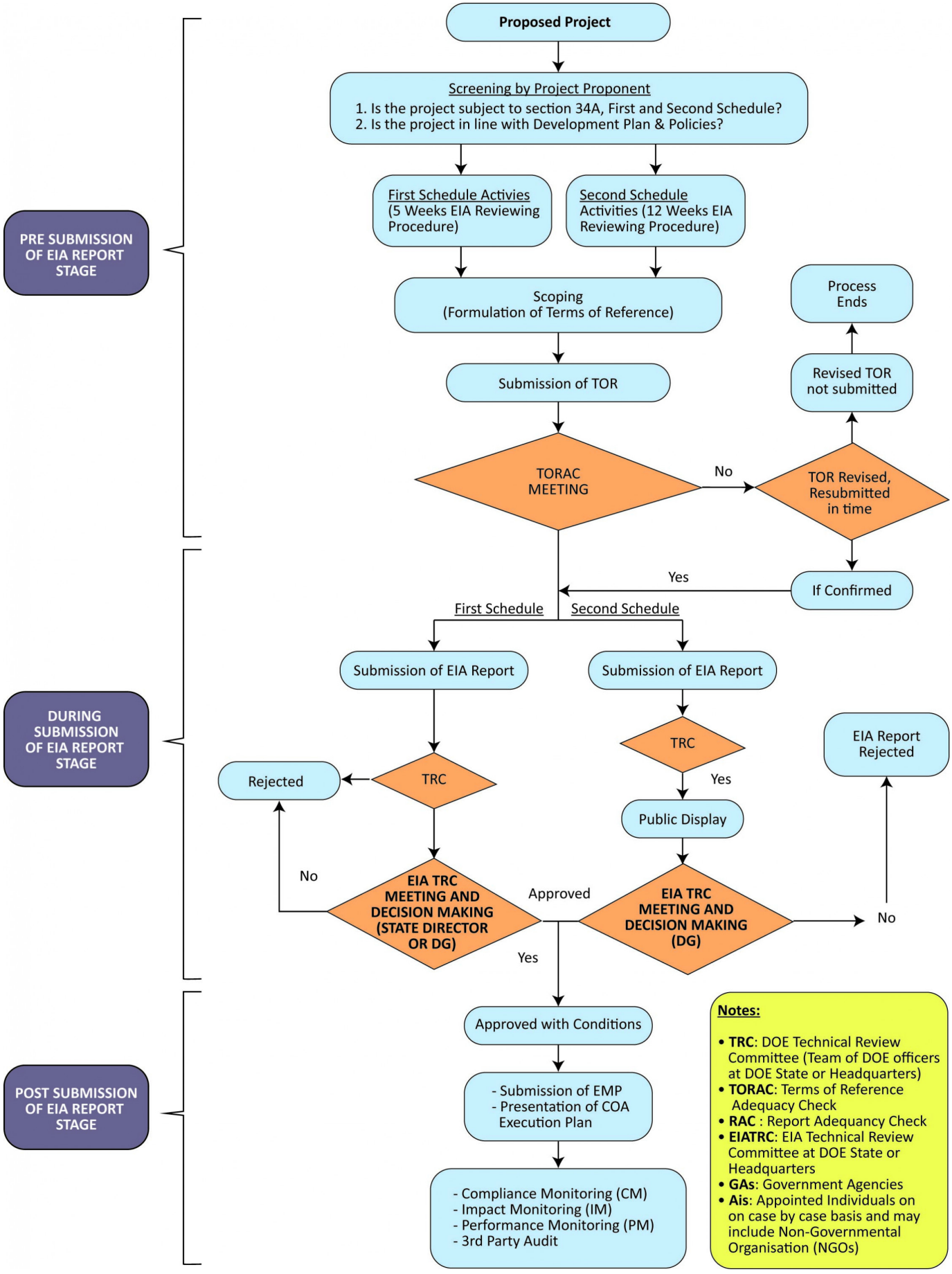
EIA is a tool to evaluate the potential impacts arising from a proposed project the physical-chemical, ecological and human components of the environment.

It identifies the key areas of environmental concerns for consideration during the project planning stage, and provides a mean to decide on the types of mitigation measures to avert or minimise the adverse impacts at an early stage.



A summary of the EIA procedure is shown in the next page

EIA PROCEDURE IN MALAYSIA



SOURCE: Environmental Impact Assessment Guideline in Malaysia (EGIM), [Department of Environment (DOE), 2016].

INTEGRATION OF ENVIRONMENTAL COMPLIANCE INTO PROJECT PLANNING

A typical project cycle involves many phases and requires inputs from various technical specialists and consultants to provide for submissions and applications to the various approving authorities, e.g. local authority. Throughout, the environmental assessment can be incorporated into the following phases:

1 PLANNING PHASE

The Project Proponent:-

- will develop a conceptual proposal and identify suitable sites for feasibility assessment.
- to ensure that all national and state policies related to the project are addressed with the relevant authorities before carrying out the EIA.

Environmental Screening and Scoping: The Project Proponent shall carry out initial screening to determine if the Project falls under any prescribed activity based on the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015.

If it does, then a scoping exercise will be undertaken to assess the environmental aspects of the site. Findings shall be presented in the Terms of Reference (TOR) report for the Department of Environment's (DOE's) endorsement.

2 FEASIBILITY & PROJECT DESIGN PHASE

The Project Proponent will conduct the technical studies and project design for submission to the approving authorities, represented by various government technical agencies, which will review the application and provide the approvals if all submissions are in order.

Environmental Impact Assessment (EIA): If a project is a prescribed activity under the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015, an EIA is required to be prepared and approved by the DOE before a project can be submitted for development order (DO) approval by the local authorities. The Project Proponent and Qualified Person(s) shall carry out the studies identified in the Terms of Reference (TOR) during the screening and scoping stage, and develop P2M2 for the project.

3 CONSTRUCTION & OPERATIONAL PHASE

Upon obtaining the project approval, e.g. DO, the project shall proceed with construction and later on, operations. Typical activities include site access establishment, mobilisation of machineries and equipment, setting up base camp, land clearing and structural works.

Post-EIA: Environmental controls and management will be through the Environmental Management Plan (EMP) which will be utilised by the Project Proponent and contractors to implement the P2M2s and environmental monitoring and auditing, throughout the construction phase and where necessary, into the operational phase.

PROJECT BRIEF

QUALIFIED PERSON

- Assess if the project falls within a prescribed activity based on the Environmental Quality (Prescribed Activity) (Environmental Impact Assessment) Order 2015.
- This will facilitate identification of the scope and requirements of the environmental compliance for that project.

PROJECT PROPONENT

- Provide a project brief, containing basic information of the project, as an overview to the Qualified Person.
- This will facilitate identification of the scope and requirements of the environmental compliance for that project

TERMS OF REFERENCE (TOR)

- Information provided shall be ensured to be adequate and provide a basis for the environmental screening and scoping, which can be detailed or revised later in the EIA.

ENVIRONMENTAL LEGISLATIVE REQUIREMENTS

The **Environmental Quality Act (EQA) 1974 (Act 127)** is the main legislation governing environmental management in Malaysia.

Amendments to this main legislation and new subsidiary legislations or regulations may be enacted from time to time, pertinent and relevant to changing circumstances. The regulations made under any previous legislations thereof, will then need to be amended and/or updated; or new regulations may be proposed when new environmental policies are adopted by the DOE to protect the environment.

The DOE under the **Ministry of Environment and Water (KASA)** is the main agency tasked to implement the **EQA 1974 (Act 127)**. It has overall functions and responsibilities on the environmental management and enforcement as prescribed under the said legislation and its subsidiary legislations and regulations.

TERMS & DEFINITION

The following terms and definitions are applicable for Schedule 1 - Activity 2 & Schedule 2 – Activity 2(a)

AERODROME

According to the Civil Aviation (Amendment) Act 2015, aerodrome means any area of land or water, including any airport, airstrip (including water airstrip), heliport, building, installation and equipment, for the use wholly or partly for the arrival, departure or movement of aircraft.

Based on Civil Aviation (Aerodrome Operations) Regulations 2016, aerodrome shall be categorised as follows:

CATEGORY

1. Government aerodrome available for use by commercial air transport aircraft
2. Government aerodrome not available for use by commercial air transport aircraft
3. Private aerodrome not available for use by commercial air transport aircraft
4. Private aerodrome available for use by commercial air transport aircraft

CIVIL AVIATION AUTHORITY OF MALAYSIA ACT 2017

SECTION 16 (3) (b)

– "aerodrome services and facilities" means the services & facilities provided -

(i) to enable the landing and taking off of aircraft such as the provisions of the following services and facilities within such areas:

(A) runways, taxiways, parking, aprons and parking stands for aircraft facilities;
(B) aerodrome visual aids and non-visual aids facilities
(C) maintenance and repair of runways, taxiways, parking aprons for aircraft, aerodrome visual aids and aerodrome non-visual aids;
(D) rescue and fire fighting services
(E) apron control services
(F) hazard and environmental management services; and
(G) supervisory and security services;

(ii) to enable within certain areas of an airport the servicing and maintenance of aircraft and the handling of cargo carried or to be carried by aircraft such as the provisions of the following services and facilities within such areas:

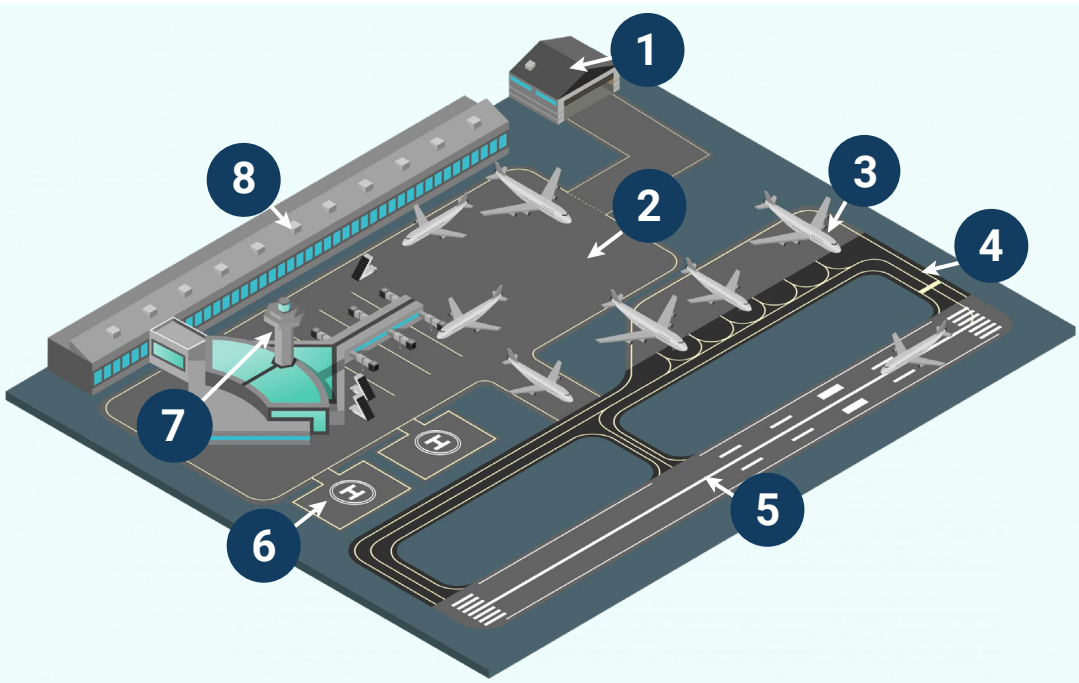
(A) hangar facilities;
(B) maintenance and refueling of aircraft and waste disposal services;
(C) storing and processing of cargo facilities; and
(D) security, customs and quarantine services for cargo;

(iii) in relation to aircraft passengers in an airport such as the provisions of the following services and facilities:

(A) aerobridges, passenger thoroughfares and seating areas facilities;
(B) flight information and public address systems facilities;
(C) flight catering
(D) services and facilities for the operation of customs, immigration and quarantine checks and control;
(E) services and facilities for the operation of security and police services; and
(F) services and facilities provided in a passenger terminal to enable the check-in and screening of passengers, including services for baggage handling and screening; and

(iv) at or from an airport for such purposes in connection with or incidental to the operation of the airport;

1. HANGAR
2. APRON
3. AIRCRAFT
4. TAXIWAY
5. RUNWAY
6. HELIPAD
7. CONTROL TOWER
8. TERMINAL



RUNWAY

Runway means a defined rectangular area on a & aerodrome prepared for the landing & take-off of aircraft.

Source : Civil Aviation (Aerodrome operations) Regulations 2016

AIRPORT

Airport means the aggregate of the lands comprised within an aerodrome including buildings, aircraft hangars, storage, facilities, roads (taxiway) & car parks used or intended to be used in whole or in part for the purposes of or in connection with the operation of such aerodrome.

Source : Civil Aviation (Amendment) Act 2015

AIRCRAFT

Aircraft means a machine that can derive support in the atmosphere from reactions of the air, other than reactions of the air against the surface of the earth.

HELIPORT

An aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.

Source : Annex 14 Aerodromes - July 2009 , International Civil Aviation Organization (ICAO)

APRON

Apron means a defined area on a land aerodrome intended to accommodate an aircraft for purposes of loading or unloading passengers, mail or cargo, fueling, parking or maintenance.

Source : Civil Aviation Regulations 2016

TAXIWAY

A defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome & another, including:

- **Aircraft stand taxilane** - A portion of an apron designated as a taxiway and intended to provide access to aircraft stands only.
- **Apron taxiway** - A portion of a taxiway system located on an apron and intended to provide a through taxi-route across the apron.
- **Rapid exit taxiway** - A taxiway connected to a runway at an acute angle and designed to allow landing aeroplanes to turn off at higher speeds than are achieved on other exit taxiways thereby minimizing runway occupancy times.

Source : Civil Aviation (Aerodrome operations) Regulations 2016

The following terms and definitions are applicable for Schedule 2 – Activity 2(b):

Construction of aerodrome in or adjacent or near to any state park, national park, national marine park, island surrounding marine park or environmentally sensitive area.

PARKS

Locality of parks (state parks, national parks, national marine parks, island surrounding marine parks) shall be in accordance to the National Physical Plan, State Structural Plan, Local Plan and/or *Rancangan Kawasan Khas*.

ENVIRONMENTALLY SENSITIVE AREA (ESA)

Areas of critical importance which has characteristics of significant biodiversity value; natural heritage; scenic beauty; provision of important ecosystem services; and/or is easily degraded due to natural and anthropogenic impacts, warranting its protection and conservation

- **In/Within** – inside of Environmentally Sensitive Areas of Rank 1
- **Near** – sharing a common boundary with ESA Rank 1
- **Adjacent** – Project Site is within 500m of ESA Rank 1

Source : *Environmental Impact Assessment Guidelines for Land Reclamation and Dredging (2018)*

Policy & Guideline Compliance

Policy & Legal Requirements

The Project has to meet all legal and environmental requirements (statutory and non-statutory) and procedures of Malaysia. The project shall be in line with and not contradict the current national and state development policies and plans, especially for high impact projects.

Due diligence shall be undertaken in regards to policy compliance and study requirements with the relevant agencies and government departments. The Project Proponent and Qualified Person are to determine the specific compliance requirements, based on the scope and nature of the project.

Existing legal provisions and policies on the guideline for **Aerodrome** are outlined in accordance to the activities as listed in the following tables, followed by ESA Framework for Peninsular Malaysia.

General Policy Adherence for Aerodrome Development

	Agencies/Department	Legal Requirements	Required Output
Project approvals and/or supporting documents	National Physical Planning Council of Malaysia (MPFN) Ministry of Transport (MOT) Regional Development Authority State Planning Committee (SPC) Local Authority (PBT)	Civil Aviation Authority of Malaysia Act 2017 Town & Country Planning Act 1976 (Act 172)	To ensure that the project complies with the national and state policies and requirements for aerodrome development
Adherence to land use compatibility (local/special area plan) Development requirements in/near ESAs Social Impact Assessment (SIA) requirements	PLANMalaysia Federal Department of Town and Country Plan Local Authority (PBT)	Town & Country Planning Act 1976 (Act 172) Town & Country Planning (Amendment) Act 2017 (Act A1522)	To ensure that the project complies with structure/local plans & are compatible with the surrounding land use To determine the need for SIA for the project
Approval of any project & activities within the marine park limits Additional requirements e.g. mitigation plan, pollution control	Jabatan Perikanan Malaysia Division of Marine Park, Department of Fisheries Malaysia	Fisheries Act 1985 (Act 317) Marine Parks Establishment Order Malaysia 1994	To ensure that the project is allowed to be developed within the marine park waters & all requirements from the department are met

	Agencies/Department	Legal Requirements	Required Output
Land status compliance Land acquisition Minerals release Sand source approvals (if reclamation is involved)	Land & Mines Office (PTG) District & Land Office (PTD)	National Land Code 1965 (Act 56) Civil Aviation Authority of Malaysia Act 2017	To ensure that the Project Proponent owns the land or has legal rights to the land. To ensure there are no constraints on the land that may prohibit it from being a development area
Geological Terrain Mapping (GTM) requirements Geotechnical report requirements Slope stability & protection requirements Traffic Impact Assessments (TIA) requirements		National Land Code 1965 (Act 35) Minerals Development Act 1994 (Act 525) Geological Survey Act 1974 (Act 129) Road Transport Act 1987 (Act 333)	To ensure that the topography, terrain & geological features within the site is suitable for development To determine the need to carry out a TIA
Development requirements in Central Forest Spine (CFS) areas & linkages (primary & secondary) & in permanent reserved forests (PRF) Protection of flora		Forestry Act 1984 (and amendments thereof) (Act 313)	To determine the status of the forest. Ensuring it can be developed and is not within PRF, water catchment, etc.
Development requirements in/near wildlife sanctuaries and other protected areas Protection of flora and fauna Require for animal relocation plan, viaduct crossings etc.		Wildlife Conservation Act 2010 (Act 716)	To determine the sensitivity of the site in terms of flora and fauna species and constraints for development

	Agencies/Department	Legal Requirements	Required Output
Hydraulic study requirements Permission for river diversion Requirement for river reserves Storm water management requirements (MSMA-2) Erosion and Sediment Control Plan (ESCP)	JABATAN PENGAIRAN DAN SALIRAN MALAYSIA State Water Authority	Street Drainage and Building Act 1974 (Act 133) State enactments on water resources, river basins and coastal areas	Determine the hydrological condition of the site & requirements pertaining to changes in river system & runoff management requirements
Development requirements within Orang Asli settlements & their roaming areas, agriculture plots, cultural, heritage, religious and archaeological sites	JAKOA JABATAN KEMAJUAN ORANG ASLI WARISAN جابتن واريسن نجا	Aboriginal Peoples Act 1954 (Revision 1974) (Act 134) National Heritage Act 2005	To ensure that the area is not occupied by Orang Asli community and if so, how to manage impacts To ensure cultural, religious or archaeological heritage areas are not impacted

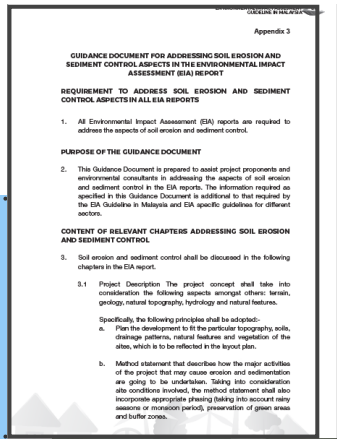
List of Policies & Plans Relevant to Development

Policies & Plans	Details & Scope
National Physical Plan-3 (NPP-3) (JPBD,2016)	National spatial planning guidelines; environmentally sensitive areas (ESAs)
State Structure & Local Plans (Various local authorities & publishing dates)	State and local level planning guidelines for aerodrome areas.
National Policy on Biological Diversity 2016 – 2025 (NRE, 2016)	Covers specifically 17 national biodiversity targets with corresponding goals and action plans to achieve within 2016 – 2025
National Transport Policy 2019 – 2030 (MOT, 2019)	Covers 5 policy thrusts and 23 strategies to develop a sustainable transportation sector.

List of Relevant Guidelines & Guidance Documents Related to Development Planning

01 **Environmental Impact Assessment Guidelines in Malaysia (EGiM), (DOE, 2016)**

Provide guidance to project proponent and qualified person in the preparation of the EIA Reports.


Appendix 3

GUIDANCE DOCUMENT FOR ADDRESSING SOIL EROSION AND SEDIMENT CONTROL ASPECTS IN THE ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

REQUIREMENT TO ADDRESS SOIL EROSION AND SEDIMENT CONTROL ASPECTS IN ALL EIA REPORTS

1. All Environmental Impact Assessment (EIA) reports are required to address the aspects of soil erosion and sediment control.

PURPOSE OF THE GUIDANCE DOCUMENT

2. This Guidance Document is prepared to assist project proponents and environmental consultants in addressing the aspects of soil erosion and sediment control in the EIA reports. The information required as specified in this Guidance Document is additional to that required by the EIA Guideline in Malaysia and EIA specific guidelines for different sectors.

CONTENT OF RELEVANT CHAPTERS ADDRESSING SOIL EROSION AND SEDIMENT CONTROL

3. Soil erosion and sediment control shall be discussed in the following chapters in the EIA report.

3.1 Project Description The project concept shall take into consideration the following aspects amongst others: terrain, geology, natural topography, hydrology and natural features.

Specifically, the following principles shall be adopted:-

a. Plan the development to fit the particular topography, soils, drainage patterns, natural features and vegetation of the sites, which is to be reflected in the layout plan.

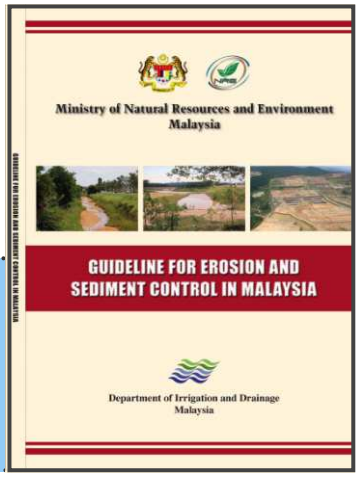
b. Method statement that describes how the major activities of the project that may cause erosion and sedimentation are going to be undertaken. Taking into consideration site conditions involved, the method statement shall also incorporate appropriate phasing (taking into account rainy seasons or monsoon period), preservation of green areas and buffer zones.

02 **Guidance Document for Addressing Soil Erosion and Sediment Control (ESC): Aspects in the EIA Report as per Appendix 3 of the Environmental Impact Assessment Guidelines in Malaysia (EGIM) (DOE, 2016).**

EIA reporting format concerning section on soil erosion & sediment control.

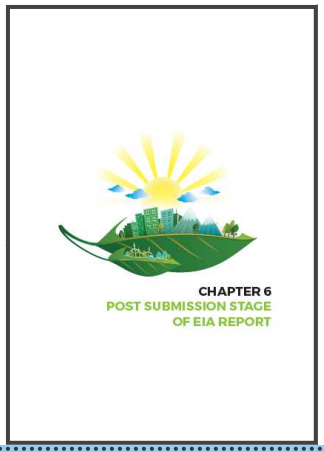
03 ***Garis Panduan Perancangan Kawasan Sensitif Alam Sekitar* (PLANMalaysia, 2017).**

Provides the requirements for development in ESAs.



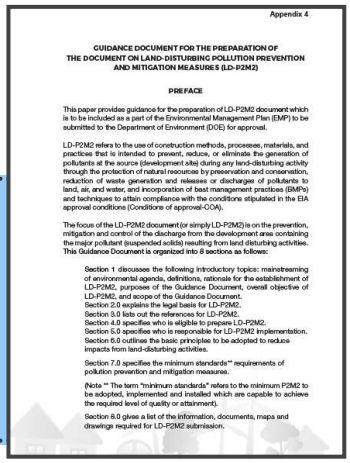
04 **Guidelines for Erosion and Sediment Control in Malaysia (DID, 2010)**

Guidelines for prevention & control of soil erosion and siltation for specific projects including examples of control measures & BMPs.



05 Guidance Document for the preparation and submission of Environmental Management Plan (EMP) as per Chapter 6 of the EGIM (DOE, 2016).

Guidance for the preparation of the EMP post-EIA including translating into action, the pollution prevention and mitigation measures (P2M2s) recommended in the EIA and the Conditions of Approval (COA).


Appendix 4

GUIDANCE DOCUMENT FOR THE PREPARATION OF THE DOCUMENT ON LAND- DISTURBING POLLUTION PREVENTION AND MITIGATION MEASURES (LD-P2M2)

PREFACE

This paper provides guidance for the preparation of LD-P2M2 document which is to be included as a part of the Environmental Management Plan (EMP) to be submitted to the Department of Environment (DOE) for approval.

LD-P2M2 refers to the use of construction methods, processes, materials, and practices that is intended to prevent, reduce, or eliminate the generation of pollutants at the source (development site) during any land-disturbing activity through the protection of natural resources by preservation and conservation, reduction of waste generation and releases or discharges of pollutants to land, air, and water, and incorporation of best management practices (BMPs) and techniques to attain compliance with the conditions stipulated in the EIA approval conditions (Conditions of approval-COA).

The focus of the LD-P2M2 document (or simply LD-P2M2) is on the prevention, mitigation and control of the discharge from the development area containing the major pollutant (suspended solids) resulting from land disturbing activities. This Guidance Document is organized into 8 sections as follows:

Section 1 discusses the following introductory topics: mainstreaming of environmental agenda, definitions, rationale for the establishment of LD-P2M2, purposes of the Guidance Document, overall objective of LD-P2M2, and scope of the Guidance Document.
Section 2.0 explains the legal basis for LD-P2M2.
Section 3.0 lists out the references for LD-P2M2.
Section 4.0 specifies who is eligible to prepare LD-P2M2.
Section 5.0 specifies who is responsible for LD-P2M2 implementation.
Section 6.0 outlines the basic principles to be adopted to reduce impacts from land-disturbing activities.

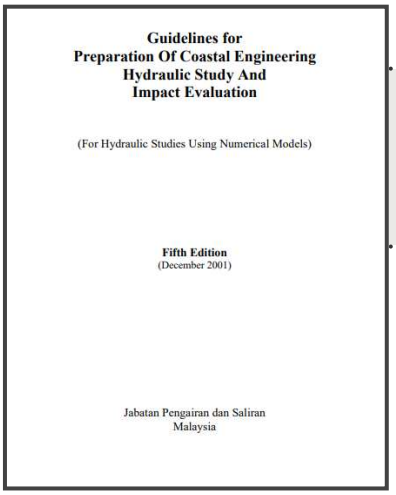
Section 7.0 specifies the minimum standards"* requirements of pollution prevention and mitigation measures.

(Note ** The term "minimum standards" refers to the minimum P2M2 to be adopted, implemented and installed which are capable to achieve the required level of quality or attainment).

Section 8.0 gives a list of the information, documents, maps and drawings required for LD-P2M2 submission.

06 Guidance Document for the preparation of the document on Land-Disturbing Pollution Prevention and Mitigation Measures (LDP2M2) as per Appendix 4 of the EGIM (DOE, 2016).

For the landward development components only, in the preparation of the LD-P2M2 document, which is to be included as part of the EMP to be submitted to DOE for approval


Guidelines for
Preparation Of Coastal Engineering
Hydraulic Study And
Impact Evaluation

(For Hydraulic Studies Using Numerical Models)

Fifth Edition
(December 2001)

Jabatan Pengairan dan Saliran
Malaysia

07 Guidelines for the Preparation of Coastal Engineering Hydraulic Study and Impact Evaluation (DID, 2001).

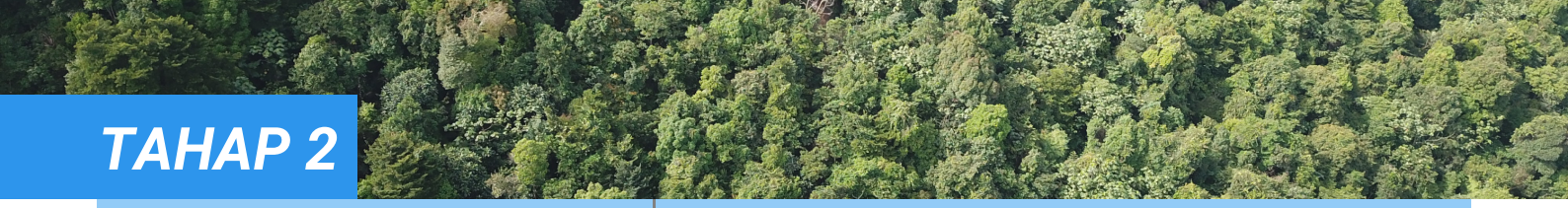
Provides requirements for preparation of hydraulic reports for coastal projects

ESA Framework for Peninsular Malaysia

as extracted from NPP3

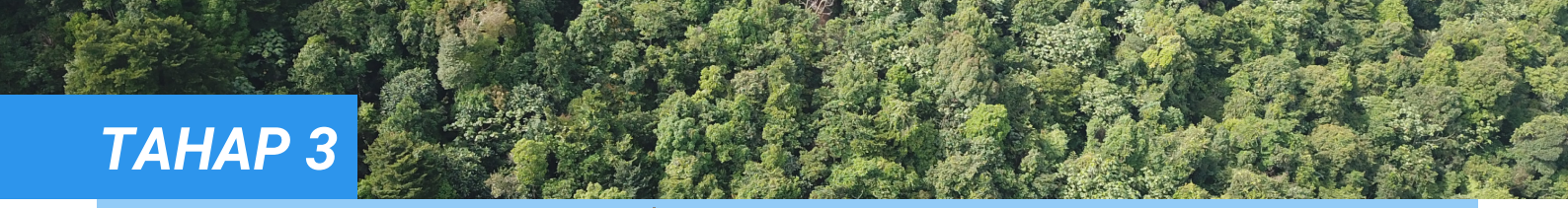
TAHAP 1

Kawasan Sensitif Alam Sekitar	Kriteria Pengurusan
Kawasan Perlindungan sedia ada & cadangan baharu	*Pemajuan1, pertanian atau pembalakan tidak dibenarkan kecuali ekopelancongan, penyelidikan dan pendidikan baharu*
Habitat terancam di luar Kawasan Perlindungan: • *Kawasan pendaratan penyu, dataran rumput laut, kawasan terumbu karang, singkapan batu kapur, permatang kuarza & tapak persinggahan burung.*	*Habitat terancam di luar Kawasan Perlindungan hendaklah dikenal pasti diperingkat Rancangan Struktur Negeri & Rancangan Tempatan;* *Pelan pengurusan perlu disediakan di mana habitat dikenal pasti dan diwartakan.*
Kawasan tadahan empangan sedia ada & cadangan baharu	*Kemudahan infrastruktur selain daripada infrastruktur empangan adalah tidak dibenarkan;* *Aktiviti pembalakan & pertanian tidak dibenarkan*
Kawasan melebihi kontur 1000m	*Pembangunan bandar & pertanian yang baharu di kawasan tanah tinggi hanya dibenarkan di dalam dua Kawasan Pengurusan Khas (KPK) 2 iaitu:* • *Cameron Highlands – Kinta – Lojing* • *Genting Highlands – Bukit Tinggi – Janda Baik* *Bagi KPK Cameron Highlands – Kinta – Lojing & Genting Highlands – Bukit Tinggi – Janda Baik, pembangunan pertanian baharu hanya dibenarkan di luakawasan hutan simpan & kawasan tadahan air* *Pembangunan baharu tidak dibenarkan di dalam KPK Bukit Fraser Pembangunan sedia ada perlu mematuhi strategi & garis panduan yang terkandung dalam Kajian Penyelarasan Pembangunan Bukit Fraser3* *Bagi kawasan tanah tinggi yang telah dibangunkan, kawalan perlu dilaksanakan melalui penyediaan Rancangan Kawasan Khas (RKK)* *Semua pembangunan & pertanian di kawasan melebihi kontur 1000m hendaklah mematuhi di kawasan peraturan & garis panduan sedia ada & akan datang secara menyeluruh*



TAHAP 2

Kawasan Sensitif Alam Sekitar	Kriteria Pengurusan
Semua hutan & tanah bencah di luar perlindungan	*Pembangunan atau pertanian tidak dibenarklan. Pembalakan mampan & ekopelancongan berimpak rendah dibenarkan tetapi tertakluk kepada halangan setempat;* *Aktiviti pembalakan mampan harus diberi penekanan dalam pemantauan & penguatkuasaan*
Kawasan tanah gambut, tanih lembut, lubang benam & bekas lombong bawah tanah	*Pemetaan kawasan ini di peringkat Rancangan Struktur Negeri & Rancangan Tempatan* *Kajian kesesuaian tapak perlu dijalankan sebelum kawasan ini dibangunkan*
Zon penampan 500m di sekeliling KSAS Tahap 1	*Zon penampan (500m) perlu diubahsuai jika terdapat pembangunan yang sedia ada atau yang telah dirancang (komited) tetapi kawalan perlu disediakan mengikut ciri-ciri kawasan tersebut* *Inventori penggunaan tanah perlu dijalankan pada peringkat Rancangan Tempatan di mana sempadan zon penampan perlu diperkemas kini dengan mengambil kira:* *Pembangunan sedia ada iaitu kawasan perindustrian, pertanian, pertempatan & lain-lain;* *Perancangan pembangunan yang terancang (komited);* *Perancangan yang melibatkan pembangunan infrastruktur yang kritikal seperti lebuh raya, landasan kereta api,talian penghantaran elektrik dan sebagainya.*
Kawasan antara kontur 300m – 1000m	*Semua pembangunan & pertanian di kawsan ini hendaklah mematuhi* *Peraturan & garis panduan sedia ada & akan dating secara menyeluruh[4]* *Kawasan ini perlu dikenal pasti, dipetakan & diperincikan pada peringkat Rancangan Struktur Negeri & Rancangan Tempatan*



TAHAP 3

Kawasan Sensitif Alam Sekitar	Kriteria Pengurusan
Zon penampan 500m di sekeliling KSAS Tahap 2	*Pembangunan terkawal di mana jenis & intensity pembangunan perlu tertakluk kepada ciri-ciri halangan. Ciri-ciri halangan termasuk zon persisiran pantai yang mengalami hakisan & kawasan yang terdedah kepada ancaman banjir.*
Kawasan tadahan takat pengambilan air & zon recaj air tanah	*Kawasan-kawasan tadahan takat pengambilan air & zon recaj perlu dikenalpasti pada peringkat Rancangan Struktur Negeri & Rancangan Tempatan.*
Pulau – pulau & Taman Laut	*Semua pembangunan di pulau-pulau & taman laut perlu mematuhi peraturan & garis panduan sedia ada & akan dating secara menyeluruh[5]*
Kawasan persisiran pantai	*Semua pembinaan di persisiran pantai perlu mematuhi RFZPPN, ISMP negeri, garis panduan sedia ada & akan dating secara menyeluruh[5]*

Source: National Physical Plan 3 (NPP3)

1 *Seperti mana yang dinyatakan di dalam Akta 172, Akta Perancangan Bandar Dan Desa, 1976*

2 *Berdasarkan Kajian Pembangunan Mampan Kawasan tanah Tinggi Semenanjung Malaysia. UPE, Jabatan Perdana Menteri, Putrajaya, 2012*

3 *JAS.2008. Kajian Penyelarasan Pembangunan di Bukit Fraser, Pahang. Jabatan Alam Sekitar, Putrajaya.*

4 *Kajian Pelan Pengurusan Khusus (Pemuliharaan) Tanah Tinggi Kinta – Cameron Highlands - Lojing, JPBD SM, 2012.*

Garis Panduan Pembangunan Di Kawasan Bukit, Kementerian Kesejahteraan Bandar, Perumahan dan Kerajaan Tempatan, 1997

Panduan Pembangunan Pertanian di Tanah Bercerun, Jabatan Pertanian, 2000

Garis Panduan Pembangunan Di Kawasan Tanah Tinggi, Kementerian Sumber Asli dan Alam Sekitar, 2005

Garis Panduan Pembangunan Di Kawasan Bukit dan Tanah Tinggi, Jabatan Perancangan Bandar dan Desa, 2009

Garis Panduan Pembangunan Di Kawasan Bukit dan Tanah Tinggi Negeri Selangor, 2010

Jadual Pertama, Perintah Kualiti Alam Sekeliling (Aktiviti Yang Ditetapkan) (Penilaian Kesan Ke Atas Alam Sekeliling), 2015, Jabatan Alam Sekitar Malaysia

Safety Guideline for Hill Site Development, Penang, 2012

5 *Garis Panduan Perancangan Pembangunan Fizikal di Pulau-Pulau dan Taman Laut, Jabatan Perancangan Bandar dan Desa, 2014*

Rancangan Fizikal Zon Persisiran Pantai Negara, Jabatan Perancangan Bandar dan Desa, 2010

Garis Panduan Eko Pelancongan Kebangsaan, Kementerian Kebudayaan Kesenian dan Pelancongan, 1997

Garis Panduan Kawalan Hakisan Berikutan dari Pembangunan di Kawasan Pantai, Jabatan Pengairan dan Saliran, 1997

National Integrated Coastal Zone Management Policy, Unit Perancang Ekonomi, 2005

Pelan Pengurusan Persisiran Pantai Bersepadu (ISMP), Jabatan Pengairan dan Saliran Negeri

Stakeholder Engagement

The EIA process has provided adequate mechanisms to enable the general public access to contribute their views and comments. Their recommendations will be taken into account in the EIA and by the EIA Technical Review Committee (EIATRC).

The mechanisms for stakeholders' participation in the EIA process can be direct, indirect and formal or informal. **The EGIM (DOE, 2016)** has succinctly highlighted this as follows:

> ..."EIA is a multi-disciplinary study on the environmental components such as water quality, air quality, waste management, environmentally sensitive areas and natural resources. It involves the participation of government agencies, non-governmental agencies (NGOs), academicians, experts and environmental practitioners including qualified and competent persons, industries and public at large. Hence, the EIA process should provide adequate opportunities to all stakeholders including the affected public to express their concerns and provide inputs for decision making process by relevant approving authority."

Identification of Stakeholders

The selection of stakeholders can be generally grouped into three main groups from:

Government Agencies (GAs) which have the powers and legal rights to administer, enforce and approve the project

General public, organisations, properties and land owners who may be directly or indirectly be affected by the project

Special interest groups or organisations representing their interests' e.g. non-governmental organisations (NGOs) related to environmental conservation

The table below provides list of possible stakeholders to be considered for stakeholder engagement process related to Aerodrome Development activities. Please note that the list provided below is an indicative, but non-exhaustive where the relevant stakeholders may vary depends on the project nature. The Qualified Person may identify any relevant stakeholders to be engaged for the project.

List of Possible Stakeholders

	ROLES & RESPONSIBILITY
1	• Administration of the EIA process under EQA 1974 • Responsible for the issuance of the Conditions of Approval (COAs) for the EIA • Post EIA approvals, monitoring and enforcement
2 **Project Proponent**	• The party to carry out the development and responsible for obtaining all necessary approvals for the site • Involved in the management of the project at all stages of development

3 **Relevant Government Agencies (GAs)**	• GAs which have roles and functions in the project and are responsible for the issuance of approvals for studies, technical reports and plans for the project
	• Engagements shall assist in determining GA requirements for the project that needs to be addressed by the Project Proponent, and also to assist in obtaining information under their respective agencies jurisdiction
	• The possible GAs to be considered for engagements are as follows:
	  • Ministry of Transport (MOT)
	  • State Economic Planning Unit
	  • Department of Director General of Lands and Mines
	  • Federal Department of Town and Country Planning (PLANMalaysia)
	  • Civil Aviation Authority of Malaysia (CAAM)
	  • Public Works Department
	  • Local Authorities
	  • Department of Drainage and Irrigation
	  • Forestry Department of State or Peninsular Malaysia
	  • Department of Wildlife and National Parks Peninsular Malaysia (PERHILITAN)
	  • Department of Fisheries (Marine Park Division)
	  • Department of Fisheries
	  • Other relevant agencies

4 **Affected Public & Local Population**	• The public or local population that may be directly or indirectly affected by the project and whose concerns and interests need to be addressed as part of the EIA • Preliminary engagement may include identifying public concerns for the project that needs to be addressed and feedback on mitigation measures • These may include; Local residents/ community, tourists & land owners
5 **NGOs**	• Provide input and feedback on issue of special interest. These may include; NGOs related to environment and other related NGOs specific to the impacted area.

METHODS in ENGAGEMENT

- Identify areas of policy and regulatory compliance from the relevant GAs.
- Obtain initial data and views from the GAs and stakeholders (communities, local leaders, etc.) to assist in preparation of the TOR.
- Obtain stakeholder feedback in identifying areas of improvement to the initial design and concept.

Documentation & Reporting

Findings from the stakeholder engagement shall be incorporated into the TOR, especially in regards to policy compliance

Proof of engagement can be in the form of written report, official response letter from the GAs, minutes of meeting (MOM), photos, etc.

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3 APPROACH & METHODOLOGY

The Terms of Reference (TOR) is the first major milestone in the overall Environmental Impact Assessment (EIA) procedure process. The Project Proponent and Qualified Person are required to carry out the environmental screening and scoping, with the findings incorporated into the TOR.

This Chapter shall detail the steps in the preparation and submission of the TOR for the endorsement of the Department of Environment (DOE).

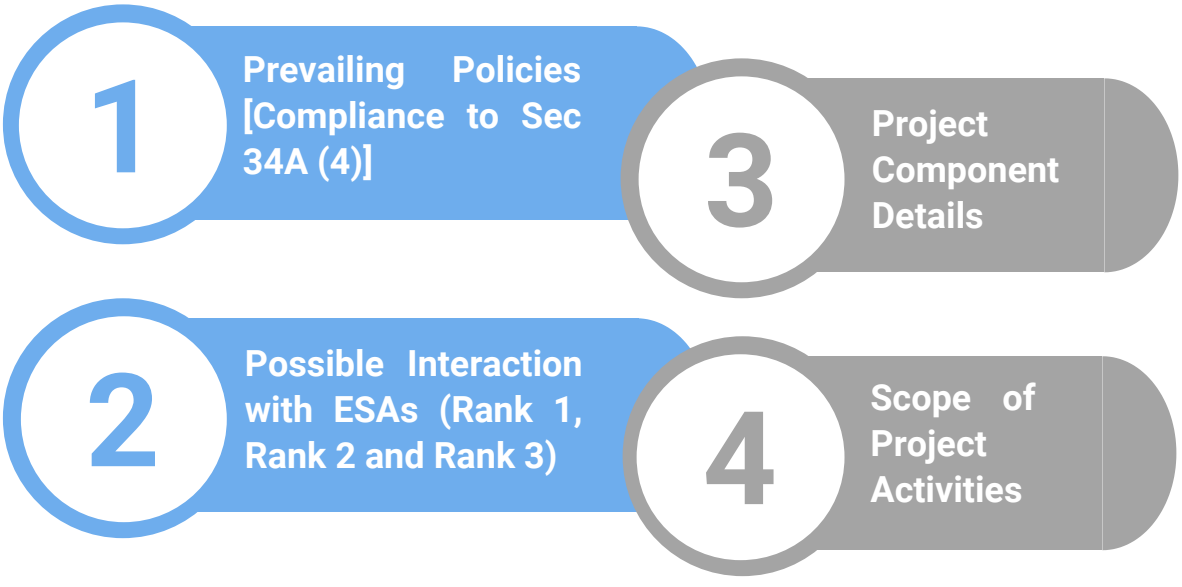
Environmental Screening Procedures

Environmental Screening is carried out to determine whether a proposed project is a prescribed activity under the Environmental Quality (Prescribed Activity) (Environmental Impact Assessment) Order 2015.

Screening is important as there are a large number of projects and activities that are potentially subject to an EIA. It also important that any project shall be screened to have complied with all national and/or state policy matters before proceeding with an EIA.

If the proposed project has components falling within BOTH First and Second Schedule prescribed activities, the Second Schedule EIA shall prevail and shall encompass all EIA requirements required of those activities. In which case, all other relevant EIA Guidelines must be referred.

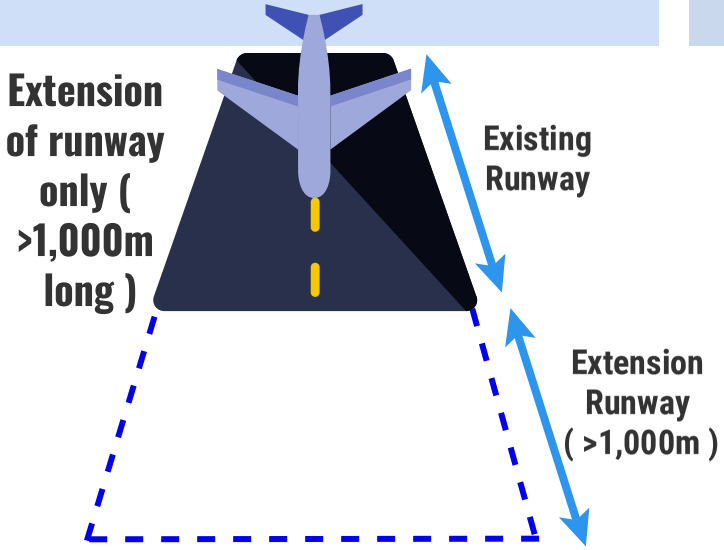
SCREENING ASPECTS



SCREENING FOR EIA

As stated under EQA Section 34A (1):
The Minister, after consultation with the Council, may by order prescribe any activity which may have significant environmental impact as prescribed activity

SCENARIOS



PRESCRIBED ACTIVITY		
FIRST SCHEDULE- ACTIVITY 2	**SECOND SCHEDULE- ACTIVITY 2**	
Expansion of an aerodrome involving a runway of 1,000 meters or longer	a) Construction of a new aerodrome involving a runway of 1,000 metres or longer	b) Construction of aerodrome in or adjacent or near to any state park, national park, national marine park, island surrounding marine park or environmentally sensitive area.
✓	✗	✗

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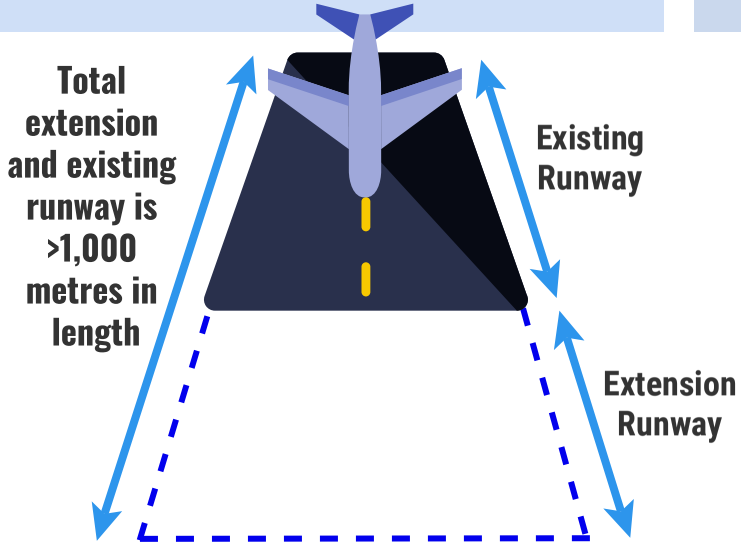

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SCENARIOS

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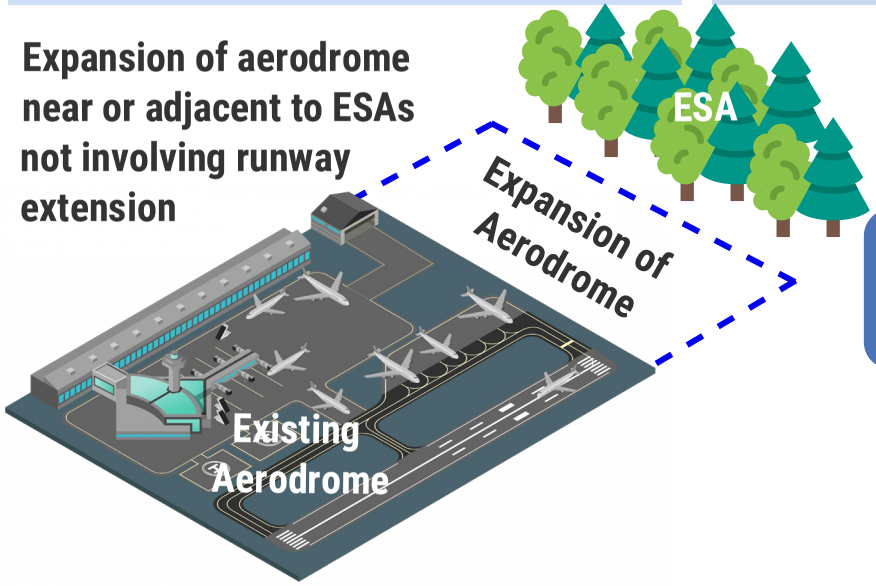
	FIRST SCHEDULE- ACTIVITY 2	SECOND SCHEDULE- ACTIVITY 2	
	Expansion of an aerodrome involving a runway of 1,000 meters or longer	a) Construction of a new aerodrome involving a runway of 1,000 metres or longer	b) Construction of aerodrome in or adjacent or near to any state park, national park, national marine park, island surrounding marine park or environmentally sensitive area.
Expansion of aerodrome near or adjacent to ESAs not involving runway extension	✗	✗	✗



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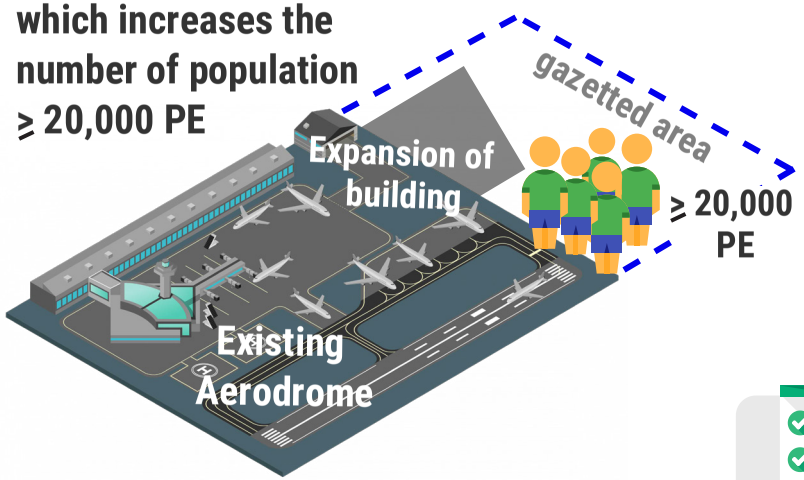
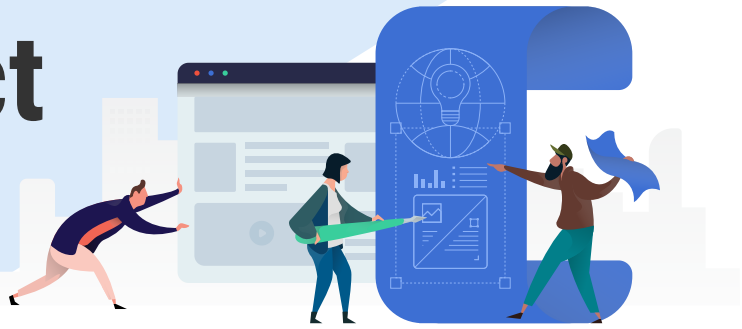
Airport expansion of building within the gazetted area which increases the number of population ≥ 20,000 PE



Note: Upgrading or expansion of building such as apron, hangar, terminal, etc except for runway within the gazetted airport area is not subjected to EIA.

Potential Outcomes from Project Screening



No EIA is required

If the project does not fall within any prescribed activities under the First or Second Schedule, and/or has insignificant impacts on the environment.

EIA is required

If the project will have potentially significant environmental impacts and/or falls within the prescribed activity under the First or Second Schedule.

Further studies and clarification from DOE

If the potential impacts from the project are uncertain, indeterminate, ambiguous or may not fall neatly within any prescribed activities, i.e. involving new technologies, DOE shall be consulted upon on the need for an EIA.

ENVIRONMENTAL SCOPING

The main objective of environmental scoping is to identify the environmental attributes and issues to determine the focus, depth, and spatial and temporal boundaries of the EIA that are deemed significant and requiring assessment in detail as part of the EIA process.

The **Scoping Exercise** comprises the following steps:

1

SITE SUITABILITY ASSESSMENT (SSA)

Based on the site constraints and technical studies, the project proponent shall consider all alternatives or options to refine and improve upon the original concept design.

2

DETERMINATION OF STUDY BOUNDARY

The Qualified Person shall determine the extent of the Zone of Study (ZOS) and Zone of Impact (ZOI) based on site conditions and environmental sensitivity.

3

BASELINE DATA REVIEW

The qualified person shall carry out qualitative assessment based on desktop study and literature review. These may be supplemented by initial site investigations and public engagements.

4

DETERMINATION OF KEY PROJECT ACTIVITIES

The Project Proponent shall outline the key project activities that will be carried out during the various phases of the project (pre-construction, construction and operations)

5

IDENTIFICATION OF SIGNIFICANT IMPACTS AND PRIORITY

This step will involve preliminary identification of significant issues for further detailed assessment in the EIA. Non-significant issues shall also be addressed accordingly in the EIA study but through general/qualitative impact prediction and evaluation.

6

SELECTION OF MITIGATION MEASURES

Based on the identified significant impacts, the Qualified Person shall determine the potential mitigation measures that need to be provided in detail in the EIA.

7

PREPARATION AND SUBMISSION OF ESI AND TOR

Findings from the scoping shall be compiled, collated, analysed and reported for DOE's endorsement.

Scoping shall be carried out at an early stage of the project cycle. It enables the EIA to focus only on the significant issues, impacts and sensitive receptors.

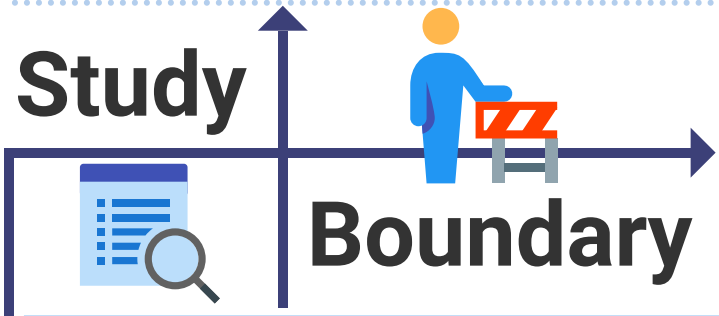
Scoping shall encompass all environmental aspects (physical-chemical, biological and socio-economic) to enable an overall evaluation of the significant impacts. At the start of the scoping exercise, no attempt should be made to exclude or pre-judge any issues of concern.

Site Suitability Assessment

During project planning, the Project Proponent shall consider alternatives and options to the proposed concept and layout based on the findings in the feasibility reports and from the scoping exercise. This will form part of the SSA detailed in the EGIM (DOE, 2016) and required for the EIA.

This step may involve a re-evaluation of the project concept, design and components to take into account the new selected options. At this juncture, the P2M2s and BMPs can still be incorporated into the project design for the final option. The final selected option shall be environmentally feasible and pragmatic.

A 'No Project' option shall also be assessed and its implications discussed comparatively with the 'With Project' option.

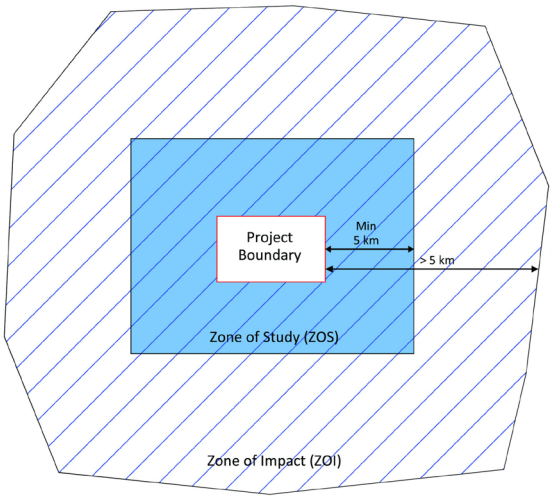


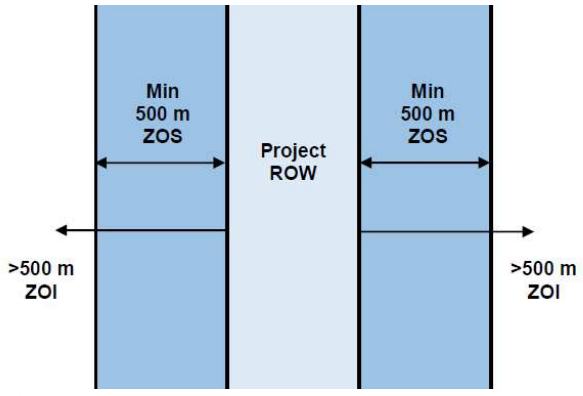
The scoping exercise shall also determine the study boundaries to gather information for the baseline for the TOR/ESI.

The Qualified Person shall obtain the necessary relevant information on the project and the surrounding ZOS, either from available secondary sources or through preliminary data gathering at the site.

In terms of criteria, the ZOS is the study area generally encompasses a 5-km radial zone from the project boundary. However, the potential impacts from the Project may extend beyond the ZOS and hence, that impact area is termed the ZOI.

The level of detail for the environmental studies shall be based on factors such as project area size, type, activities and potential impacts to surrounding areas, which shall be determined by the Qualified Person in carrying out the EIA.





Difference between ZOS & ZOI for Linear Projects

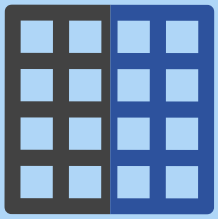
BASELINE DATA REVIEW

Baseline information shall be qualitative but adequate to assess the potential impacts resulting from the project on the sensitive receptors. However, if there are available supporting information available, these can be included as well.

If any of the items in the list are unavailable at the time of scoping, but is important to the EIA, it must be recorded as items to be addressed at the EIA stage. Items irrelevant or insignificant to the project can and shall be omitted during scoping.

The relevant items shall be prioritised based on the levels of significance.

DETERMINATION OF KEY PROJECT ACTIVITIES



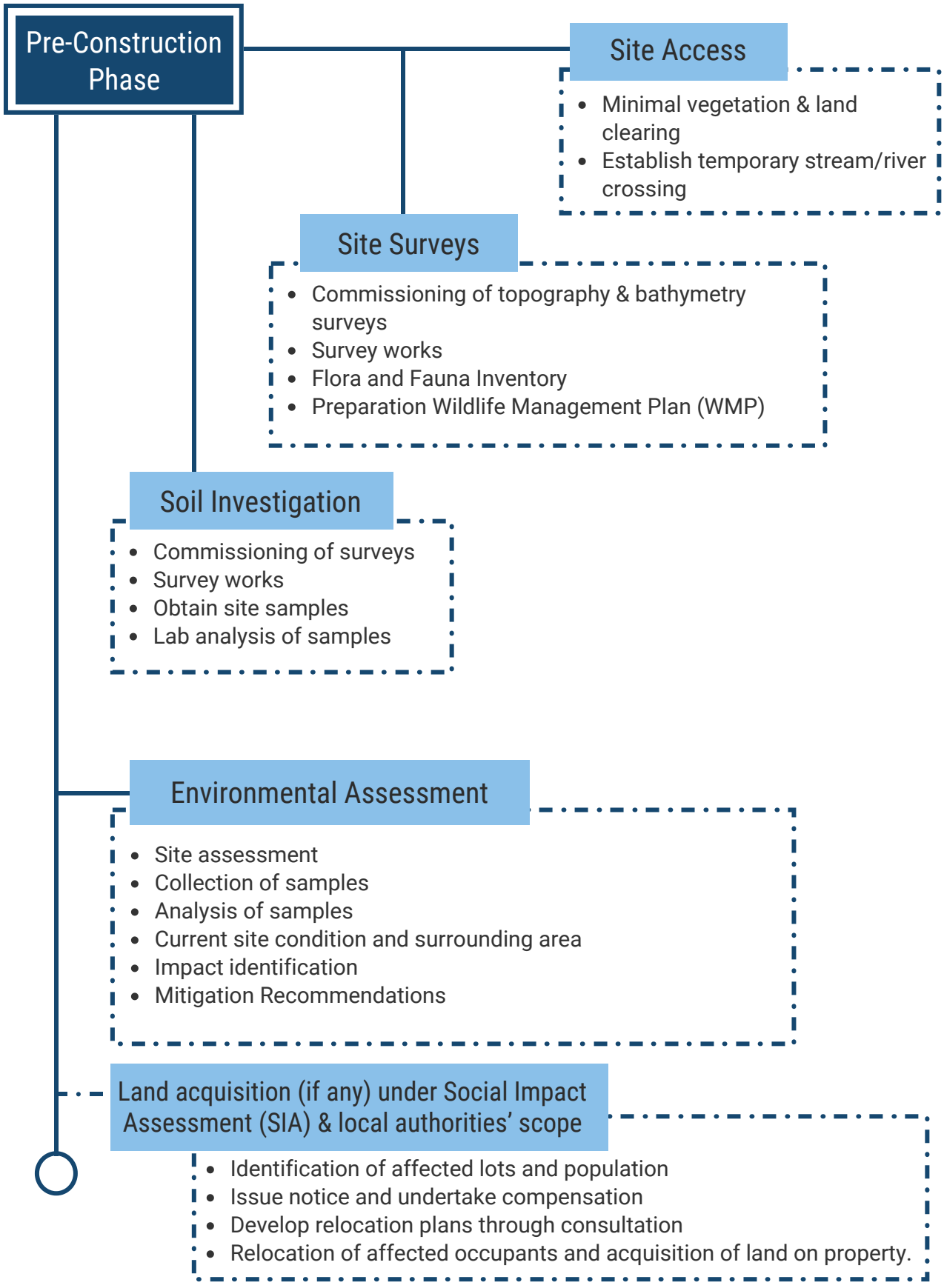
Project activities are the basis for assessing the potential impacts for aerodrome projects. The key activities can be categorized based on the project phases that are:

- Pre-construction Phase
- Operational Phase
- Construction Phase

The pre-construction activities include pre-feasibility, feasibility and design stage of the project.

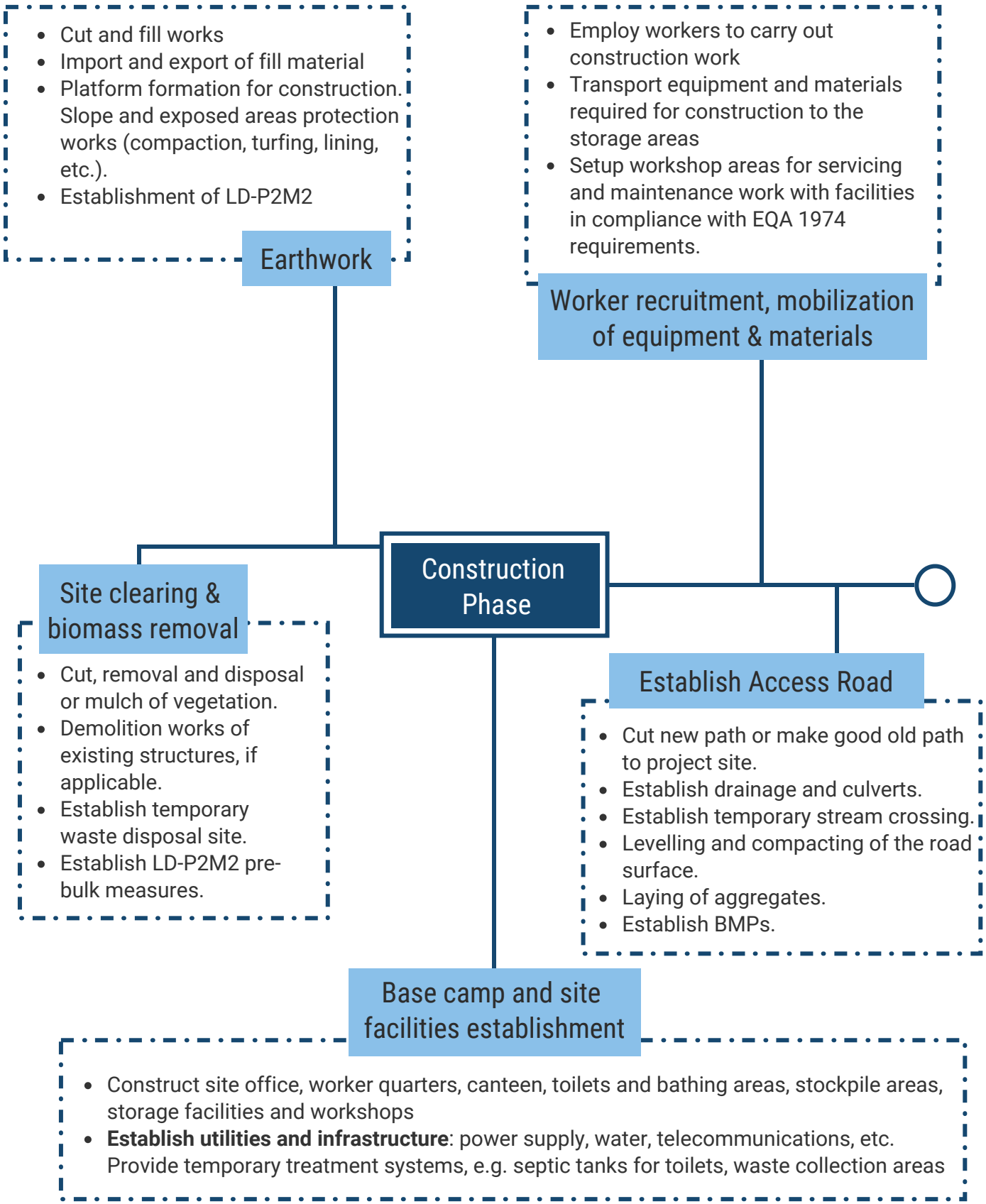
The summary list of activities in a typical aerodrome project by phases is shown in the following tables. The list is not exhaustive and the Qualified Person shall add or delete to the list, whenever and wherever necessary.

List of Typical Project Activities during Pre-Construction Phase

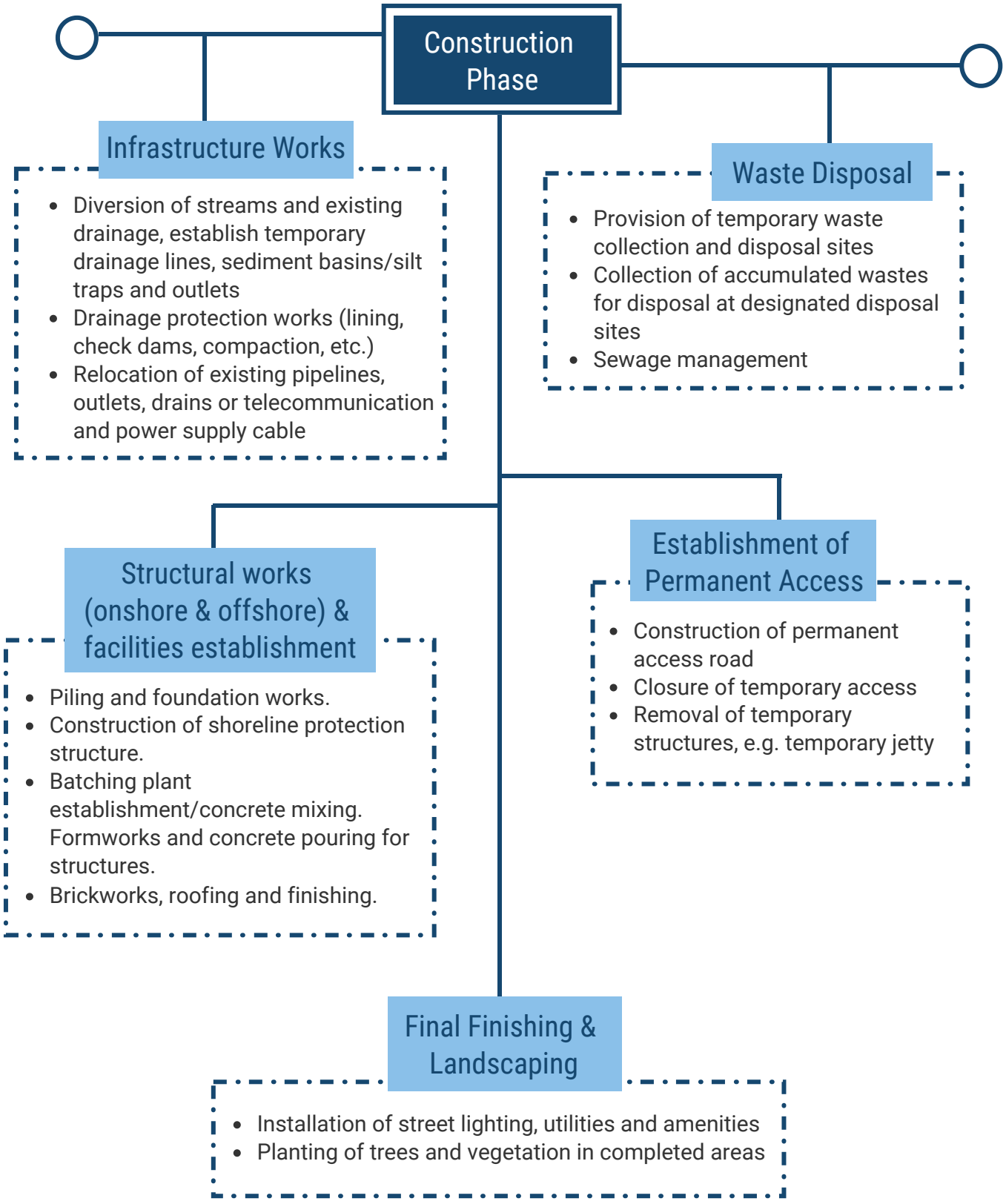


Note: The list is not exhaustive & not all the above may be relevant to the project. It is the responsibility of the Protect Proponent & Qualified Person to determine the relevant information required for environmental assessment & compliance.

List of Typical Project Activities with Issues of Concern during Construction Phase

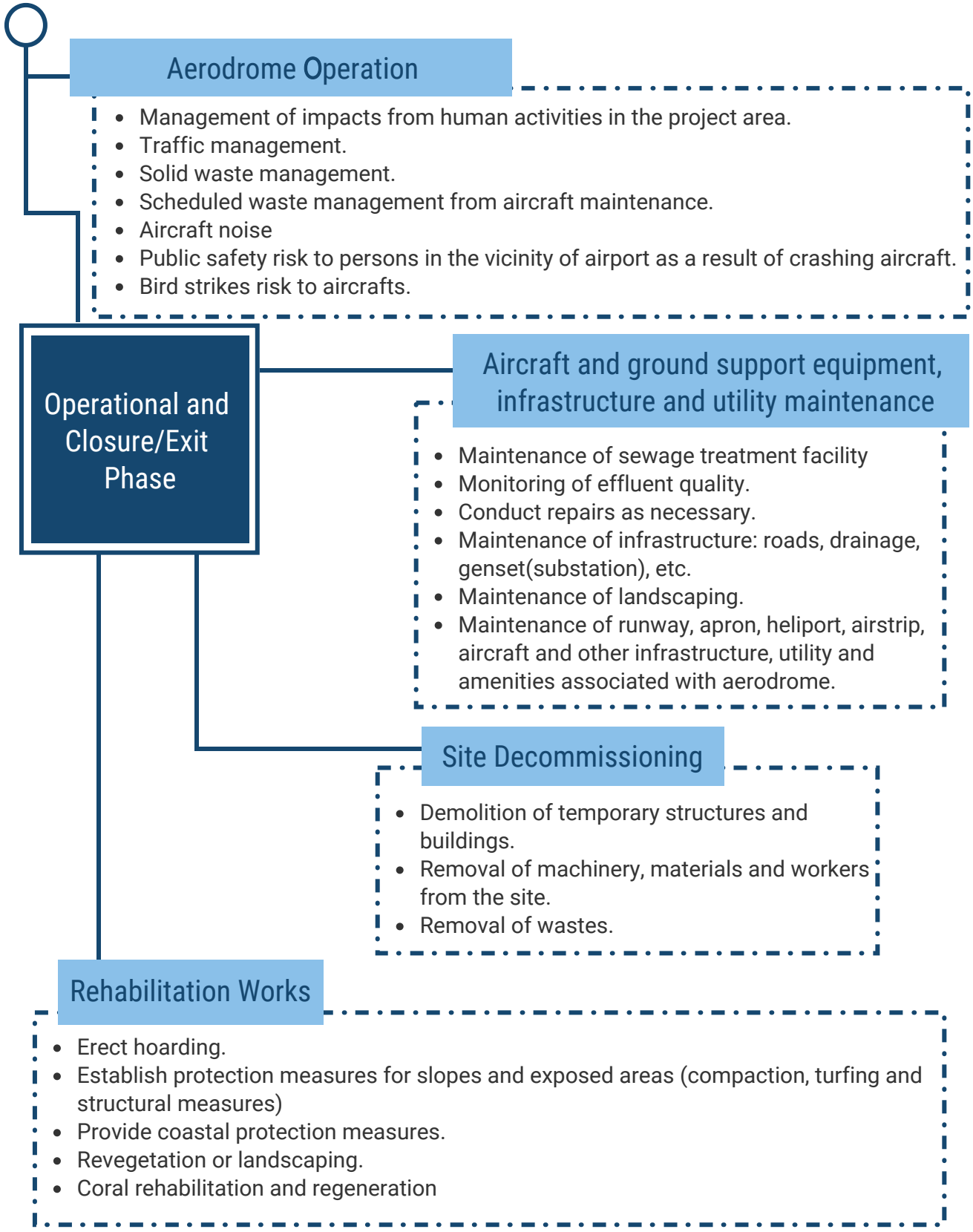


List of Typical Project Activities with Issues of Concern during Construction Phase (cont.)



Note: The list is not exhaustive & not all the above may be relevant to the project. It is the responsibility of the Protect Proponent & Qualified Person to determine the relevant information required for environmental assessment & compliance.

List of Typical Project Activities with Issues of Concern during Operational and Closure/Exit Phases



Note: The list is not exhaustive & not all the above may be relevant to the project. It is the responsibility of the Protect Proponent & Qualified Person to determine the relevant information required for environmental assessment & compliance.

Identification of Significant Impacts and Priority Settings

SELECTION OF METHOD

There are many methods and tools to conduct the scoping exercise. These include checklists, matrices, or any other accepted methods, to assist in systematically organising, collating and analysing the data for the project. At the TOR stage, qualitative assessment is adequate but quantitative data can be provided to support the assessment. The table below lists the advantages and disadvantages of the various common methods used.

Advantages and Disadvantages of Impact Identification Methods

ADVANTAGES	METHODS	DISADVANTAGES
• Easy to understand and use. • Good for site selection and priority setting. • Simple ranking and weightages.	CHECKLIST	• Do not distinguish between direct and indirect impacts. • Do not link action and impact. • The process of incorporation of values can be controversial.
• Link action to impacts. • Good method for displaying EIA results.	MATRICES	• Difficult to distinguish direct and indirect impacts. • Have potential for double-counting of impacts.
• Easy to understand. • Focus and display spatial impacts. • Good siting tool.	OVERLAYS	• Can be cumbersome. • Poorly suited to address impact duration or probability.
• Link actions to impacts. • Useful in simplified form to check for second order impacts.	NETWORKS	• Can be very complex if used beyond simplified version.
• Good for impact identification and spatial analysis. • Good for experimenting.	GIS AND COMPUTER EXPERT SYSTEMS	• Heavy reliance on knowledge and data. • Often complex and expensive.
• Earlier detection of associated risk • Saving cost and time • Protecting resources	RISK ASSESSMENT	• Complex calculation, ambiguity • Depends on external entities • Difficult to implement

KEY ISSUES RELATED TO AERODROME PROJECTS

Some of the key environmental impacts that should be highlighted in the TOR and EIA:

ECOLOGY AND SUSTAINABILITY

Ecology is important for maintaining the natural balance and sustenance of the ecosystem. Its components and processes include the variety of living plants, animals and other organisms, the genetic differences among them, the communities and ecosystems in which they occur, and the ecological and evolutionary process that keeps them functional. Forested area which sustain a host of flora and fauna species, including endemic, rare, endangered, and threatened and near extinct species. Coastal and Marine are ecologically rich comprising diverse habitats of mangrove forests, mudflats, coral reefs, sandy beaches, dunes, estuaries and coastal forests.

Development involving land clearing will degrade the overall integrity of the area. Forest fragmentation can restrict the free movement of animals within their roaming range and human disturbance may drive many away from their habitats. The degree of impact depends on the extent and size of the development.

Any disturbance to them could lead to environmental deterioration, Marine Park Department, Department of Wildlife and National Parks Peninsular Malaysia (PERHILITAN), State or Federal Forestry Department, and any state or local government agencies or stakeholders have to be engaged to discuss measures for ecological sustainability before proceeding with the EIA.

The construction of the aerodrome project on the migratory bird route will cause a bird strike/ hazard. Thus, the location of the airport should be outside the migratory bird route. Apart from that, resident birds can also have the same bird strike impact. This can cause damage to the aircraft engine and requires high costs to repair.

SITE ACCESS

Impacts from land access may not be as severe if roads and tracks are already available. However, if new access is built, this will involve land clearing and construction works, which leads to erosion and sedimentation and loss of flora and fauna. The effects are also felt downstream where the eroded materials accumulate and cause localised ponding and flooding, some of which are also caused by improperly constructed stream crossings that obstruct the natural stream flows.

HYDROLOGY

During and after land clearing and platforming, the natural physical terrain and drainage of the area will change hydrologically and morphologically. Silt from erosion will result in shallower streams. The local groundwater table and the drainage structure may also change.

VISUAL EFFECTS

Removal of vegetation and exposure of the bare areas will have a negative visual impact compared to a natural scenery with greenery. The design of buildings and landscaping can help to blend in with the natural environment to provide a positive visual appeal.

Any deterioration of the marine ecology and coastal areas will mar the aesthetics and scenic quality of these areas. Similarly, man-made structures may not be compatible with the natural environment that results in lowering the aesthetic value for tourism.

NOISE AND VIBRATION

Noise can be significant during the construction and operation of the aerodrome project. The noise and vibration issues usually relate to the impact on human being. Therefore, the most significant sources of noise and vibration from airport operations are aircraft during the landing and takeoff (LTO) cycles. The noise also can come from ground operations equipment including aircraft taxiing, operation of ground support vehicles for example passenger buses, mobile lounges, fuel trucks, aircraft tugs, aircraft and baggage tractors, aircraft auxiliary power units (APUs) and aircraft engine testing activities in airports with aircraft maintenance activities. Other indirect sources of noise include ground vehicle traffic from access roads leading to the airport.

AIR AND CLIMATIC FACTORS

Aerodromes activities have the potential to affect local air quality and climate, and to contribute to global climate change. Combustion of aviation fuel – aviation fuel is composed mostly of kerosene which produces nitrogen oxides (NOx), carbon monoxide (CO), carbon dioxide (CO2), sulphur oxides (SOx), hydrocarbons and particulates when it burns. NOx emissions from aircraft are likely to provide a significant proportion of the emissions from the area as a whole, and hydrocarbon and carbon monoxide emissions can be high. In addition, vapour trails can significantly reduce solar radiation reaching the ground surface, and the high-level emissions from aircraft will contribute to global warming.

DETERMINING EIA STUDY REQUIREMENTS

The preceding sections have identified the key environmental impacts. The table below provides a list of the studies for the EIA study. The list is indicative and non-exhaustive and the Qualified Person's judgement is needed since Aerodromes projects may involve landward and/or seaward.

The following table provides list of Indicative studies that may or may not be required by other Government Agencies (GAs) related to aerodromes development on landward and/or seaward. Again, the list is not exhaustive and depends on the requirements of the respective GAs.

Relevant Studies for the EIA Involving Aerodrome Development at Landward and/or Sea

Study Reference	Prescribed Activity			
	First Schedule Activity 2	Second Schedule Activity 2		
	Landward and/or Sea#1	Landward Only	Landward and/or Sea#2	Sea Only#2
Slope Analysis (Landward) Terrain & Slope				
Soil Erosion Analysis (Landward) Soil Loss & Sediment Yield				
LD-P2M2 (Landward)				
Pollution Study (Sewage)				
Baseline Sampling (water, air, noise, vibration) *1				
Geological Terrain Mapping				
Topographic Survey				
Bathymetry Survey *2				
Hydraulic Study *2				
Shoreline Survey *3				
Ecological Habitat Mapping *4				
Carrying Capacity *5				
Stakeholder Consultation				
Post-EIA Monitoring Programme				
Other Study Requirements by GAs				

Notes:

- First Schedule Activity 2: Expansion of an aerodrome involving a runway of 1,000 meters or longer.
- Second Schedule Activity 2: (a) Construction of a new aerodrome involving a runway of 1,000 metres or longer (b) Construction of aerodrome in or adjacent or near to any state park, national park, national marine park, island surrounding marine park or environmentally sensitive area.
- #1 Coastal reclamation or land reclamation along river banks < 50 hectares (Environmental Quality (Prescribed Activities)(Environmental Impact Assessment) Order 2015
- #2 Coastal reclamation or land reclamation along river banks > 50 hectares (Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015
- *1 Based on site conditions and project activities.
- *2 Requirements based on the Guidelines for Preparation of Coastal Engineering Hydraulic Study and Impact Evaluation [Department of Irrigation arid Drainage (DID), 2001].
- *3 Requirements based on DID Manual Volume 2 - Coastal Management (DID, 2009)
- *4 If adjacent to ESAs Rank I and II as defined by NPP3.
- *5 Carrying capacity shall be based on PLANMalaysia criteria and requirements

Study Requirements by Other Relevant GAs

Study Requirements	GAs Involved
Soil Investigation	JMG
Erosion and Sediment Control Plan (ESCP)	JABATAN PENGAIRAN DAN SALIRAN MALAYSIA
Terrestrial, Aquatic & Marine Flora & Fauna Assessment	PERHUTANAN; PERHILITAN; Jabatan Perikanan Malaysia; Jabatan Taman Laut Malaysia

Study Requirements	GAs Involved
Marine Risk Assessment (MRA)	
Zoning and Landuse Compatibility	PLANMalaysia Federal Department of Town and Country Planning
Social Impact Assessment (SIA)	PLANMalaysia Federal Department of Town and Country Planning
Health Impact Assessment (HIA)	
Traffic Impact Assessment (TIA)	
Wastes (biomass, scheduled wastes: construction, municipal etc.)	Local Authority (PBT)

Note: The list is not exhaustive and not all the above may be relevant to the project. It is the responsibility of the Project Proponent and Qualified Person to determine the relevant information required for environmental assessment and compliance.

Selection of Mitigation Measures

The Qualified Person with the assistance of the technical consultants and specialists shall assess the BATs, BMP's and options for P2M2 to address the identified key environmental issues.

At the point of the TOR/ESI, the identified measures shall be qualitative and descriptive only, to be further detailed in the EIA stage.

Selection of Method

There are many methods and tools to conduct the scoping exercise. These include checklists, matrices, or any other accepted methods, to help in systematically organising and analysing the compiled data for the project. At this stage, qualitative assessment is adequate.

An Environmental Scoping Matrix is a useful tool in identifying first-order effects that will give an indication of the focus and content of the EIA study. The matrix amalgamates the scores from the series of criteria; ranging them from major to minor in negative and positive formats of environmental impacts. (Refer to Figure 3.3)

A Qualified Person with experience shall complete the scoping exercise and matrix. However, the Project Proponent's input is vital at this stage because the severity of impacts varies from one project to another and their know-how and experience would ensure appropriate weightage is given to the issues under assessment.

From the scoping matrix outputs, a priority list of environmental impacts shall be determined for in-depth studies and assessments in the EIA.

Preparation & Submission of TOR/ESI

Findings from the scoping exercise shall be incorporated into the ESI as information to develop the TOR.

The TOR shall be submitted to DOE for review and endorsement before proceeding to the EIA stage.

EIA Matrix for Potential Impacts (Sample)

MATRIX OF POTENTIAL ENVIRONMENTAL IMPACTS ARISING FROM THE PROJECT DEVELOPMENT

MATRIX

- ☐ [illegible]
- T [illegible]
- X [illegible]
- N [illegible]
- D [illegible]
- E [illegible]

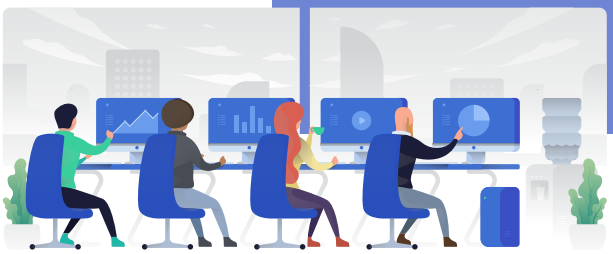
			PROJECT ACTIVITIES																						
			SITE INVESTIGATION					CONSTRUCTION												OPERATIONS AND MAINTENANCE					
		Identification of Activities	Land Survey	Environmental Surveying	Engineering Investigation	Social-Economic Surveying	Hydraulic Study	Access by Boat/Floating Pontoon	Site Clearing/Land Development	Worker Camps/Maintenance Yards	Drainage System	Sedimentation Control Structures	Erosion Control	Jetty Construction (Inbuilt Installation)	Building Construction Activities	Scheduled Waste Disposal	Solid Waste Disposal	Landscaping	Abandonment Plan (If Any)	Employment/Labour Force	Utilities Management	Solid Waste Disposal and Recovery	Traffic/Transportation (Boat)	Maintenance	Accidents/Fire Control
ENVIRONMENTAL COMPONENTS / PHYSICO-CHEMICAL	LAND	Landforms	T					T	N	T	E		E	N	E			E	N						
		Soil Profile			T				N																
		Soil Composition			T				N																
		Slope Stability							N																
		Subsidence and Compaction			T			N	N		E				N				N						
		Seismicity			T																				
		Flood Plains/ Swamps																							
		Land Use		T	T			T	N	T			E	E	E			E	N					N	
		Buffer Zones	T	T				N	N									E							
	SURFACE WATER	Flow Variation					T		N	N	E	E			N									E	
		Water Quality		T			T	N	N	N	E	E	E		N	N	N	E	N			N		E	
		Drainage Pattern					T		N	N	E	E			E				N					N	
		Water Balance																							
		Flooding							N																
		Existing Use		T					N	N					E			E	N						
	GROUNDWATER	Water Table			T				N		T				N										
		Flow Regime			T				N		T				N										
		Water Quality			T				N		T				N	N	N								
		Recharge									T														
		Aquifer Characteristic																							
		Existing Use																							
	ATMOSPHERE																								
		Air Quality		T				N	N						N			E	N				N	E	
		Air Flow																							
		Climatic Changes							N																
		Visibility							N						N			N							
	NOISE	Intensity		T				N	N	N				N	N					N			N	E	
		Duration		T				N	N	N				N	N					N			N	E	
		Frequency						N	N	N				N	N					N			N	E	
ENVIRONMENTAL & BIOLOGICAL	SPECIES AND POPULATIONS	Terrestrial Vegetation	T					N	O						N			E	N						
		Terrestrial Wildlife	T	T	T				O						O				O						
		Other Terrestrial Fauna	T					N	O						N			E	N						
		Aquatic/Marine Flora					T							N									N		
		Fish					T							N									N		
		Other Aquatic/Marine Fauna					T							N									N		
	HABITATS & COMMUNITIES	Terrestrial Habitats	T					N	O						N			E	N						
		Terrestrial Communities	T					N	N						N										
		Aquatic Habitats					T							N									N		
		Aquatic Communities					T							N									N		
	HEALTH AND SAFETY	Physical Safety	T	T	T	T	T	T	N	N			E	N	N		N		N		E	N	N	E	E
		Psychological Well-Being				T		T	N	N				N	N	N	N	E	O	E	E	N	N	E	E
HUMAN		Parasitic Disease								N															
		Communicable Disease								N															
		Physiological Disease								N															
	SOCIAL AND ECONOMIC	Employment	E	E	E	E	E		E	E				E	E			E	O	E	E		E	E	
		Housing													E				O						
		Education																			E				
		Utilities												E	E				O		E			E	
		Amenities												E	E				O		E			E	
		Property & Settlement												E	E				O						
	AESTHETIC AND CULTURAL	Landforms	T					T	O	T				N	N			E	N					E	
		Wilderness	T	T	T				O																
		Water Quality		T			T	N	N	N	E	E	E	N	N	N	N	E	N			N		E	
		Atmospheric Quality						N	N						N			E	N				N	E	
		Climate																							
		Tranquility				T		T	N	T				N	N		N	E	N			N		E	
		Sense of Community				T		T	N	T				E	N				N			N			
		Community Structure				T			N	T				E							E		E	N	
		Historic Places/ Structures																							
		Religious Places/ Structures													E										
		Landscape							O									E	N					E	

TOR Table of Contents (TOC)

The TOR and ESI are required for prescribed activities, which fall within either the First or Second Schedules.

The report(s) shall be prepared in accordance with the format detailed under the Guidance Document for Preparing TOR under Appendix 8 of the EGIM (DOE, 2016).

TOR Adequacy Check (TORAC)



1. The output from scoping is documented as the Environmental Scoping Information (ESI). The ESI shall provide the basic information of the current environment issues with identified key impacts that need to be assessed in detail. All these will then be incorporated as the scope of work in the Terms of Reference (TOR).

2. A review shall be carried out by the EIA Technical Review Committee (EIATRC) comprising the DOE officers and appointed individuals (AIs) and/or GAs. The adequacy of the scoping exercise and TOR can be decided in a TORAC meeting, chaired by the DOE Headquarters (HQ)/State Director. However, this will depend on the nature of the project to be developed.

3. When the Report is accepted the Project Proponent shall proceed to the EIA stage.

4 ENVIRONMENTAL IMPACT ASSESSMENT: BASELINE DATA

After endorsement is given by the Department of Environment (DOE) for the Terms of Reference (TOR) or the Revised TOR, the Project Proponent and Qualified Person shall then proceed with the Environmental Impact Assessment (EIA) study.

Compared to the TOR stage, the EIA stage requires detailed information to be incorporated into the Report. At this stage of work, the preliminaries for the project would have been completed and the overall project planning has moved on to the detailed design stage alongside with the essential technical assessments and studies.

The following Chapters shall detail the requirements for baseline data collection as part of the EIA.

Preliminary data, mostly based on secondary data and initial site assessment, would have been collected during the environmental screening and TOR stage to provide an overview of the existing environment.

Based on those data, the methodology and approach in obtaining detailed data and technical studies would have been identified and approved by the EIA Technical Review Committee (EIATRC) and incorporated into the TOR.

During the EIA stage, in-depth information and more data shall be collected and collated to describe the existing environment.

The scope shall cover the three major environmental components:

- Physico-chemical environment
- Biological environment
- Socio-economic environment

The collected environmental baseline must be appropriate to provide sufficient grounds to draw up the potential impacts for which mitigation measures will be planned for any negative impacts.

Environmental Baseline Scope & Requirements

Supporting information and relevant studies required by other approving agencies shall also be incorporated into the EIA to provide an overall comprehensive assessment. Supporting information, studies or reports shall be endorsed by the respective GAs which has authority to do so.

Aspect	Scope & Requirement	Relevant Agencies for Reference
Terrain	• Description of existing topography and bathymetry based on land and hydrographic surveys. • Geological Terrain Mapping (GTM) of the project site and surrounding areas. (to be prepared and certified by Professional Geologist Registered under Board of Geologist Malaysia (BoG) • Geotechnical report.	JUPEM, JMG, Jabatan Alam Sekitar Malaysia
Geology and Soil	• Description of local and regional soil and geology. • Analysis of soil profile obtained from soil investigations. • Estimates of soil loss and sediment yield from the project site.	Jabatan Alam Sekitar Malaysia, Jabatan Pengairan dan Saliran Malaysia, JMG
Hydrogeology	• Hydrogeological assessment. • Seismicity assessment.	JMG, JKR
Hydrology	• Description of hydrological systems within and surrounding the project site (rivers, streams and drainage). • Identification of downstream receptors such as water intake points (WIPs) and water treatment plants (WTPs). • Flood risk analysis, if required. • Total Maximum Daily Load (TMDL) analysis, if required.	Jabatan Alam Sekitar Malaysia, Jabatan Pengairan

Aspect	Scope & Requirement	Relevant Agencies for Reference
Water Quality	• Sampling and analysis of water quality of waterways and water bodies within the Zone of Impact (ZOI).	*State Regulatory Agencies on Water*
Air Quality	• Sampling and analysis of ambient air quality of the project site and nearby sensitive receptors. • Carbon emission baseline data	CAAM
Noise level and Vibration	• Measurement and analysis of ambient noise and vibration levels of the project site and nearby sensitive receptors.	
Waste	• Estimation of the amount of biomass waste generated from site clearing. • Identification of potential scheduled waste generated from the project site. • Identification of futeure spoil disposal areas.	JPSPN *Local Authority*
Land Use	• Description of existing & future land use (map + description) within ZOI • Identification of environmentally sensitive areas (ESAs) & impact receptors • Land use compatibility assessment	PLANMalaysia Federal Department of Town and Country Planning *Local Authority*
Climate	• Obtain long-term (min. 5 year) climate data to define the weather patterns for the project site	MET Malaysia
Risk	• Determination of Public Safety Zone (PSZ) area	PLANMalaysia Federal Department of Town and Country Planning CAAM

Aspect	Scope & Requirement	Relevant Agencies for Reference
Ecology	• Habitat mapping of ESAs (terrestrial & aquatic) • Provide an inventory and assess the terrestrial & aquatic biodiversity within the Project Site • Identify any endemic, endangered, threatened & near extinct species within the project site & surrounding ZOI • Carrying capacity study, if required.	PERHILITAN Jabatan Perikanan Malaysia
Socio-economy	• Data on demography, and socio-economic profiles of stakeholders within the ZOI. • This shall be based on the findings of the Social Impact Assessment (SIA), if carried out separately.	JAKOA PLANMalaysia Federal Department of Town and Country Planning
History, Culture & Archaeology	• Identify locations of significant historical, cultural, heritage and archaeological value (graves, ritual areas, heritage buildings, artefacts, pre-human habitation, etc.)	WARISAN *Department of Museums Malaysia*
Land and Sea Traffic	• Existing traffic within and surrounding the project site. • This shall be based on the findngs of the Traffic Impact Assessment (TIA) and the Marine Department Fisheries Department needs.	JKR
Infrastructure, Utilities and Amenities	• Availability of existing & future utilities (water, electricity, sewage, waste management, road networks, tele-communication etc.) • Discharge points of sewage & effluent • This shall be based on the findings of the Laporan Cadangan Pemaju (LCP), if any, or obtained from the Project Proponent.	JKR TENAGA NASIONAL *Local Authority (PBT)* *Water Supply Authority/ Providers*

Note: The above represents a full list of potential baseline studies, the Qualified Person shall be responsible in determining the relevant baseline requirements based on the project needs.

PRIMARY DATA COLLECTION

Primary data collection is necessary to fill in the gaps in information identified during the TOR/ESI stage. Common methodologies include on-the-ground surveys and sampling programmes at-site. The sampling/study boundary shall be within the project's ZOI.

Samples collected must be analysed by a Skim Akreditasi Makmal Malaysia (SAMM) Accredited Laboratory. Details of sampling (person in charge, time, date and location of sampling) must be clearly stated. All certificates and data shall be included.

The scope and requirement for such studies are to be determined by the respective GAs and report are to be approved by the said GAs before incorporation as part of the EIA.

SECONDARY DATA COLLECTION

Secondary data can be referred from other official sources to support the EIA.

Sources of information must be clearly state along with its date of the publication in the EIA.

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5 ENVIRONMENTAL IMPACT ASSESSMENT: EVALUATION OF IMPACTS

There are many methods to evaluate the impacts. Generally, all methods of impact evaluation seek to compare the existing environment against a predicted future environment caused by various project activities in all phases of project development.

Predictions and assessments are made through qualitative or quantitative approaches and methods that form the basis of evaluation.

While there is no one method that fits all requirements, the predictive and assessment method chosen must have at least the following attributes:

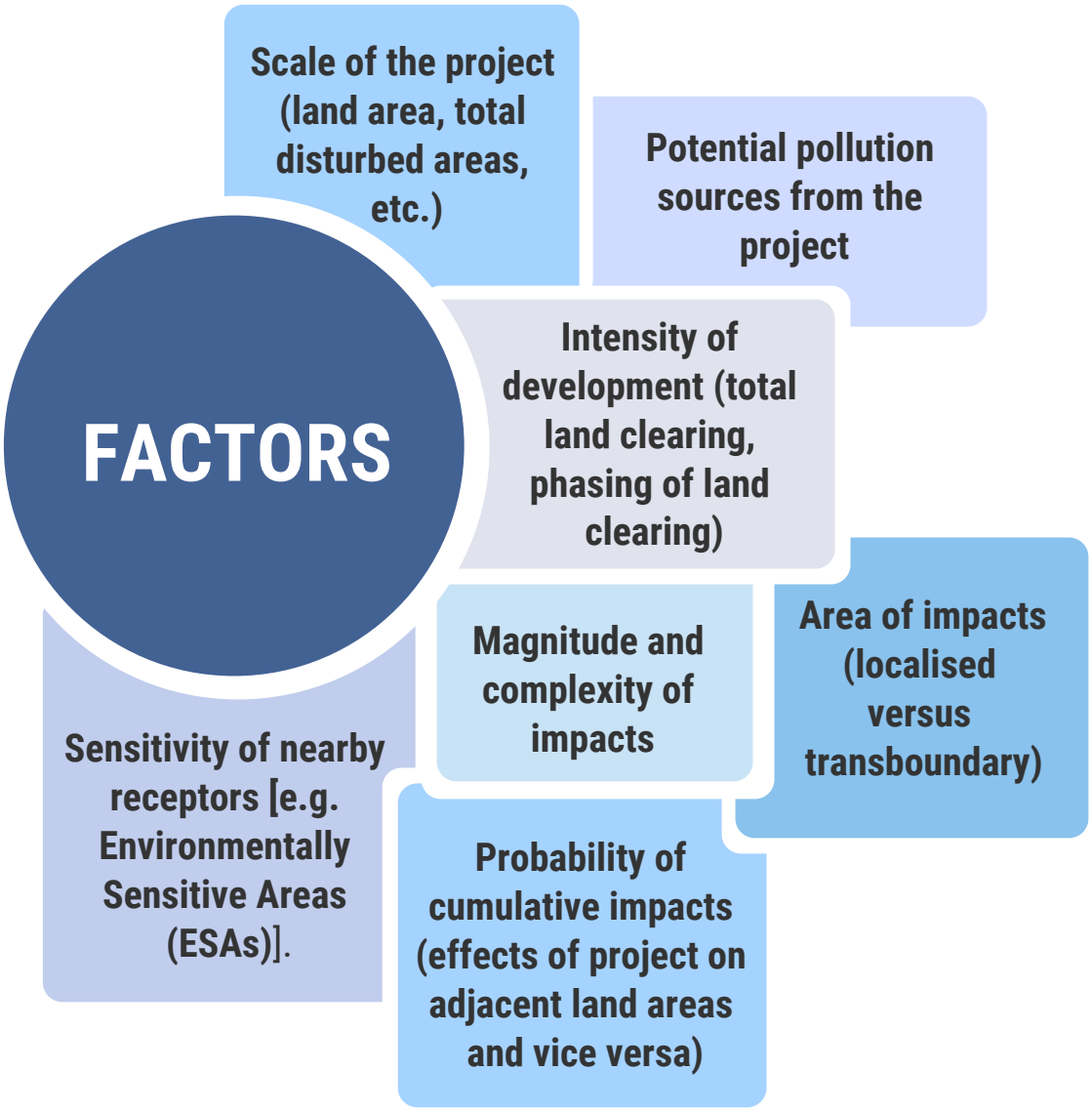
1. Established & proven models/methods
2. Adequate, accurate & up-to-date data for assessment
3. Results can be replicated & reproducible by independent evaluators
4. Cost-effective & for any software, it can be purchased (propriety software & tools can be used). If possible use of widely accepted freeware is encouraged.

It is up to the Qualified Person to select the best method to conduct investigations and generate reliable scenarios and datasets to ascertain the magnitude, extent and significance of any impacts from the project.

PREDICTION & EVALUATION OF IMPACTS

The Scoping Exercise would have determined the types of studies that need to be carried out during the Environmental Impact Assessment (EIA) stage (refer Section 3.8). Hence, the endorsed Terms of Reference (TOR) need to be referred in order to ensure the EIA is focused.

The level of details in the impact identification shall commensurate with the following factors:



Impacts of Aerodrome Development Activities

The typical issues and impacts associated during pre- construction stage are as follows:

TYPICAL ISSUES & IMPACTS DURING PRE-CONSTRUCTION STAGE

Activities	Issues	Impacts
Site access, site surveys including topography, bathymetry survey & soil investigation	**Ecology** 	• Landward: Minimal threat to wildlife (hunting/poaching) • Seaward: Minimal disturbance of coastal and marine habitats.
	Safety and health 	• Work-related injuries • Accidents • Improper waste management attracts pests & scavengers
Land Acquisition (if any)	**Socio-economy** 	• Loss of income & job opportunities
	Community 	• Homeless • Increase demand for new settlement or residential units. • Increased demand for facilities, utilities and amenities

Note: The list is not exhaustive and not all the above may be relevant to the project, It is the responsibility of the Project Proponent and Qualified Person to determine the relevant information required for environmental assessment and compliance.

TYPICAL ISSUES & IMPACTS DURING CONSTRUCTION STAGE

Activities	Issues	Impacts
• Establish access road • Site clearing • Setting up site facilities and base camp • Establish vessel facilities (if applicable) • Mobilisation of equipment and materials • Earthworks • Infrastructure works • Structural works • Waste disposal • Establishment of permanent access • Final finishing and landscaping	**Ecology** 	• Disturbance and possible loss of terrestrial flora and fauna. • Threat to wildlife (hunting/poaching) • Human wildlife conflict • Disturbance and possibly reduction or loss of coastal and marine habitats.
	Waste 	• Biomass wastes from land clearing and trimming works. • Solid wastes and sewages from work camps and top-side development. • Construction and demolition (C&D) wastes. • Scheduled wastes from workshops and refuelling stations can result in land and water contamination. • Odour and unsightliness from improper waste management at site.
	Water Quality 	• Increase runoff and turbidity into nearby water courses. • Water pollution due to leakage of oil and chemicals from equipment and machinery operations • Adverse effect to adjacent watercourses or downstream drainage system. • Effects of spread of sediment plumes on water quality • Groundwater quality pollution
	Erosion and Sedimentation/ Coastal Erosion 	• Soil erosion, landslide and sedimentation • Affect aesthetic value of adjacent areas. • Long-term accretion and erosion of coastal areas due to hydraulic changes.
	Hydraulic and Hydrodynamics 	• Altered coastal watercourses. • Storm surges resulting in coastal flooding. • Changes in wave climate; current speed and direction; tidal conditions; and pollutant dispersion patterns.

TYPICAL ISSUES & IMPACTS DURING CONSTRUCTION STAGE (cont.)

Activities	Issues	Impacts
• Establish access road • Site clearing • Setting up site facilities and base camp • Establish vessel facilities (if applicable) • Mobilisation of equipment and materials • Earthworks • Infrastructure works • Structural works • Waste disposal • Establishment of permanent access • Final finishing and landscaping	**Air Quality** 	• Open burning by workers. • Emission from fuel burning equipment. • Emissions from construction site traffic. • Dust generation
	Noise 	• High noise levels from piling, demolition works, construction, machineries and vessels.
	Traffic 	• Heavy vehicle access along public roads. • Spillage onto roads. • Damage to roads. • Safety risk to road users and communities
	Marine Traffic 	• Vessel traffic increase. • Safety and risk of collision. • Oil spills and wastewater discharge from vessels.
	Safety and Health 	• Work-related injuries. • Improper waste management attracts pests and scavengers • Accidents. • Risk of communal disease spread.
	Socio-economy 	• Increase job opportunities, employment and business. • Conflicts due to presence of foreign workers. • Increased demand for facilities, utilities and amenities. • Nuisance and disturbance to nearby communities. • Relocation of people away from proposed airport/airfield site

Note: The list is not exhaustive and not all the above may be relevant to the project, It is the responsibility of the Project Proponent and Qualified Person to determine the relevant information required for environmental assessment and compliance.

TYPICAL ISSUES & IMPACTS DURING CONSTRUCTION STAGE

- Dust Generation

- Land contaminated with scheduled wastes

- Increase runoff and turbidity into nearby water courses

- Erosion of coastal areas

TYPICAL ISSUES & IMPACTS DURING OPERATIONAL STAGE

Activities	Issues	Impacts
Aerodrome operation	Ecology	• Long term implications on the flora and fauna habitats. • May drive some species away from the local area. • Trees lost or roosts destroyed to reduce risks of bird strikes. • Disturbance to aquatic ecosystem.
	Water Quality	• Pollution from spills or leaks of fuel and oil. • Sewage and sullage from operations.
	Traffic	• Road traffic volume is expected to increase.
	Noise	• Aircraft noise particularly at areas likely to be impacted. • Road traffic noise.

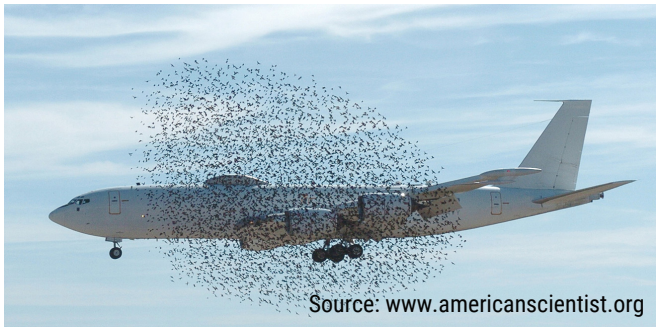
	Air	• An increase in road traffic volume resulting in an increase in vehicle emissions.
		• An increase in aircraft movements resulting in an increase in aircraft emissions.
		• An increase in airport vehicles movements
		  • SOx and NOx emissions tend to be significant
		  • CO and HC emissions – particularly due to on the ground aircraft idling

	Waste	• Solid waste from the aircrafts, from passenger, commercial establishments, offices, accommodations, tenants and putrescible wastes from services.
	Socio-economy	• Increase job opportunities, employment and business. • Increase of land and property values • Increased demand for facilities, utilities and amenities. • Continued migration of people away from the site.

TYPICAL ISSUES & IMPACTS DURING OPERATIONAL STAGE (cont.)

Activities	Issues	Impacts
Aerodrome operation	Safety and Health	• Work-related injuries. • Improper waste management attracts pests and scavengers • Accidents. • Safety and health risks.
	Risk	• Risk of aircraft crash during landing and taking off
	Land use	• Impact on future land use and surrounding of the airport area.
Aircraft and ground support equipment maintenance and repair	Water Quality	• Pollution from spills or leaks of fuel and oil.
	Waste	• Scheduled wastes from maintenance works.
	Safety and Health	• Work-related injuries. • Safety and health risks.
	Socio-economy	• Increase job opportunities, employment and business.

Note: The list is not exhaustive and not all the above may be relevant to the project, It is the responsibility of the Project Proponent and Qualified Person to determine the relevant information required for environmental assessment and compliance.



Bird strike

Aircraft noise

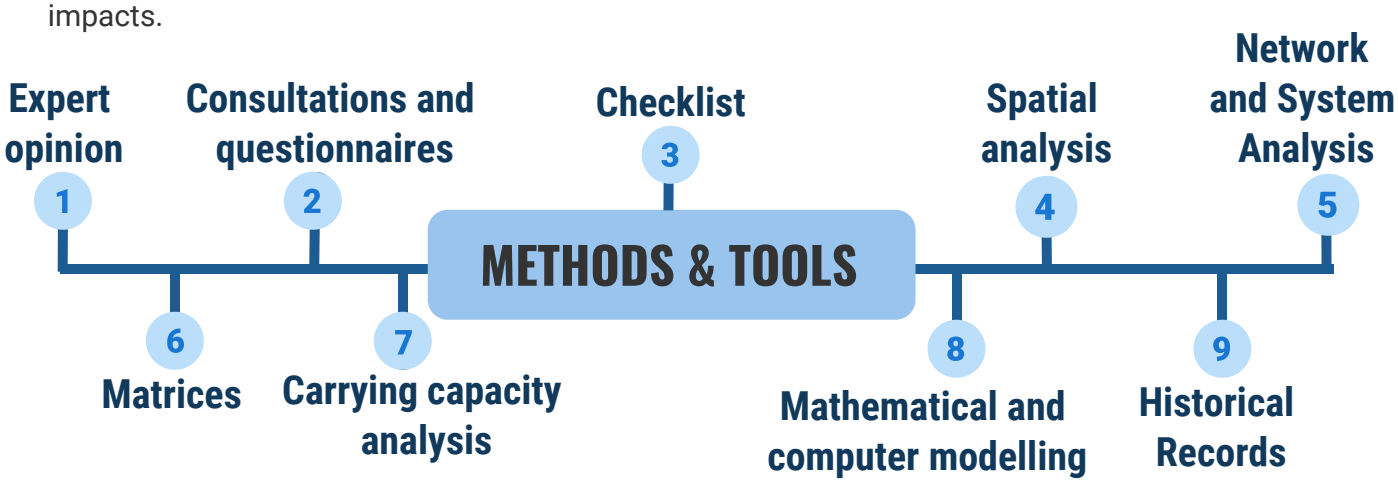
TYPICAL ISSUES & IMPACTS DURING REHABILITATION AND ABANDONMENT STAGE

Activities	Issues	Impacts
Decommissioning/ Abandonment includes demolition of structures	**Water** 	• Disturbance of contaminated soil and subsequent pollution of water courses • Pollution from spills or leaks of fuel, oil and construction materials
	Hydraulic and Hydrodynamics 	• Change in flow velocities • Increased flood risk • Changes in wave climate; current speed and direction; tidal conditions; and pollutant dispersion patterns.
	Erosion and Sedimentation/ Coastal Erosion 	• Long-term accretion or erosion of coastal areas due to hydraulic changes. • Increased erosion and subsequent changes in bed and bank stability
	Waste 	• Construction and demolition (C&D) wastes.
	Communities 	• Decrease property values • Provide temporary berthing area and shelter to fishing vessels
	Socio-economy 	• Loss of job opportunities
	Visual Impact 	• Loss of vista.

Note.: The list is not exhaustive and not all the above may be relevant to the project, It is the responsibility of the Project Proponent and Qualified Person to determine the relevant information required for environmental assessment and compliance.

Predictive Methods & Tools

There is a wide range of predictive tools and models for prediction, evaluation and assessment of impacts.



Simple methodology is preferred, though this depends on the complexity of the impacts whichever method is chosen, it must be appropriate to address the problem, taking into consideration the local conditions of the site.

The EIA Report must be scientifically and technically sound and whenever necessary, quantitative impact prediction on the more significant impacts should be carried out.

If computer modelling is carried out, e.g., for water and air quality assessment, flooding etc. The following information is required:

1. **Name and description of method/model.**
2. **Model set-up.**
3. **Data collection and analysis.**
4. **Calibration and validation.**
5. **Detail of scenarios for modelling.**
6. **Presentation of results (raw data, table form, graphs).**
7. **Limitations in data collection or method chosen.**

All modelling exercises carried out shall capture the impacts under various scenarios, either for short-, mid- to long-term for the worst-case scenario. The outputs of the modelling studies shall be presented in a concise manner and all uncertainties shall be discussed.

Technical reports, data analysis and tables and raw data, where necessary, shall be included as appendix in the EIA to support the impact assessment methodology.

Ultimately, the main text for impact assessment in the EIA shall be the predictive results and outputs of studies, which have to be in sufficient technical details to support the assessment. It must also be written in a mariner that is easily understood by decision makers and the public.

The following table summarises examples of the available and accepted prediction methods for impact assessment and expected outputs. The list is not exhaustive, The Qualified Person has to propose the best methods relevant to the project under study, or to select one of the methods in the list.

EXAMPLES OF PREDICTION METHODS FOR ENVIRONMENTAL IMPACTS

Impacts	Prediction Methods	Output
Hydraulic and Hydrodynamics	• Use of hydraulic and hydrodynamics models which meets the requirements of the Department of Irrigation and Drainage (DID). • 2D/3D modelling software e.g. **Delft3D** including D-Flow module to investigate hydrodynamics pattern, dispersion of sediment transport and coastal morphological processes.	• Sediment dispersion (concentration and extent) from reclamation and other construction works. • Changes in the wave, water level and current condition at the project site during and after project implementation. • Sediment transport along the project site during pre- and post-construction phase.
Erosion and Sedimentation	• Revised Universal Soil Loss Equation (RUSLE). • Modified Universal Soil Loss Equation (MUSLE). • Computer models	• Soil loss rates and sediment yield. • Erosion risk and potential soil loss maps.

Hydrology	• Hydrological procedures (DID), Computer models for estimating peak flood, runoff, watershed analysis, flood plain hydraulics, etc. Examples include:
	  • HEC-HMS
	  • HEC-RAS
	  • FLO-2D
	  • TUFLOW
	  • EXTRAN
	  • SWMM
	• Hydrological analysis in accordance with Manual Saliran Mesra Alam Edisi-2 (MSMA-2) and approved by DID.
		• Estimation of pre-construction and post-construction runoff.

EXAMPLES OF PREDICTION METHODS FOR ENVIRONMENTAL IMPACTS (cont.)

Impacts	Prediction Methods	Output
Water Quality	• Mathematical models (one, two or three-dimensional) analysis of pollution loads and dispersion in the waterways, such as QUAL2K. MIKE11, etc. QUAL2K MIKE11 • Simple mass balance models, e.g. Streeter-Phelps Model. • Operational sewage discharge modelled using Ouai2K or Delft, D or MIKE11.	• Estimation of TSS (erosion) and ROD and AN (sewage) concentration affecting a stretch of river and downstream sensitive areas. • Estimation of pollution load and extent of effect on sensitive receptors.
Air Quality	• Gaussian plume dispersion model to assess dust generation and gas dispersion over an area under the worst case scenario.	• Dispersion contour map indicating levels at sensitive receptors. • Comparison of computed values with the Malaysian Ambient Air Quality Standards (MAAQS). • Determination of location of maximum air pollution concentration.
Noise level	• Mathematical models to assess noise levels for point source or linear sources. • Noise modelling software such as: Sound PLAN Cadna A or Geographic Information System (GIS) acoustic models. • Aircraft/airport noise models.	• Quantitative values for noise level at sensitive receptors. • Noise contour map Indicating levels at sensitive areas. • Comparison of computed values to DOE's permissible noise limits.

EXAMPLES OF PREDICTION METHODS FOR ENVIRONMENTAL IMPACTS (cont.)

Impacts	Prediction Methods	Output
Biomass 	• Estimation on total biomass based on vegetation types and published studies values	• Predicted biomass waste generation
Schedule Wastes 	• Identification of potential scheduled wastes generation during construction and operations based on project activities.	• Predicted scheduled waste generation.
Ecology 	• Comparative assessment of conservation status and sensitivity of habitat, flora and fauna. • Ecological models for species diversity and population change. • Limit of Acceptable Change (LAC). • Spatial models such as GLOBIO3. GLOBIO Global biodiversity model for policy support	• Habitat map. • Species inventory, especially of rare, endangered, threatened and near extinct species that may require protection.
Socio-economy 	• Social and economic surveys on affected population. • Perception survey to ascertain acceptance of project. • Social Impact Assessment (SIA) if necessary.	• Socio-economic profiling. • Public opinion survey results. • Stakeholder feedback for EIA including possible mitigation measures.
Risk 	• National Air Traffic Services (NATS) model or equivalent NATS	• Determine the Public Safety Zones (PSZs)
Land use 	• Compatibility assessment based on structure plan, local plan and other guidelines • Adherence to required setback based on national and state guidelines.	• Land use compatibility and buffer requirements.

EXAMPLES OF PREDICTION METHODS FOR ENVIRONMENTAL IMPACTS (cont.)

Impacts	Prediction Methods	Output
Public Health 	• Qualitative/quantitative health risk assessment (HRA) encompassing hazard identification, exposure assessment and risk characterisation.	• Potential health impacts to nearby population.
Solid Wastes 	• Waste generation estimation based on population	• Predicted waste generation.
Traffic 	• Traffic impact assessment including simulation of peak traffic flows under various scenarios and junction analysis, e.g. Signalised and Unsignalised Intersection Design and Research Aid (SIDRA).	• Comparison of traffic scenarios pre- and post-project and need for road improvements.
Marine Traffic 	• Marine Risk Assessment (MRA) to determine risk of accidents and incidents during construction. • Marine traffic impact assessment.	• Identification on probability of potential risks involving vessels (human and marine organisms). • Comparison of marine traffic before and after situations.
Infrastructure and Utilities 	• Existing demand estimation methods by regulators, e.g. population equivalent (P.E.) calculations [National Water Services Commission (SPAN)]. • Comparison of existing supply to meet future demand to determine adequacy.	• Estimates of demand.
Aesthetics 	• Visual assessment on scenic and aesthetic value of the area. • 2-D and 3-D Viewshed Analysis. • Economic valuation.	• Before and after scenario.

Note: The list is not exhaustive and not all the above may be relevant to the project. It is the responsibility of the Project Proponent and Qualified Person to determine the relevant method and study that required for environmental as and compliance.

Outcomes from Assessment

The method to determine the level of significant impact is to benchmark the results against the stipulated current criteria and standard limits imposed by DOE and/or various Government Agencies (GAs).

In situations where there are no local standards or limits, regional and international examples of limits and adherence levels can be adopted based on expert opinion of the Qualified Person. However, the chosen criteria and standards must be suitable and relevant to local conditions.

The table below provides a list of the evaluation criteria for various environmental components to be used as a guide.

CRITERIA & STANDARDS FOR ENVIRONMENTAL PARAMETERS

Impacts	Evaluation Criteria
Water Quality and Pollution Control	• Ambient water quality: National Water Quality Standards (NWQS). • Ambient marine water quality: Malaysia Marine Water Quality Criteria and Standards (MMWQCS), • Sewage discharge: Environmental Quality (Sewage) Regulations 2009. • Toilets and septic tanks: SPAN approved design and requirements. • **Vessels:** The International Convention for the Prevention of Pollution from Ships 1973/1978 (MARPOL 73/78) and Marine Department of Peninsular Malaysia requirements - oil, sewage, bilge, ballast water, solid and scheduled wastes (Annex I, IV and IV).
Erosion and Sedimentation	**Guidance Documents** • Guidance Document for Addressing Soil Erosion and Sediment Control Aspects in the EIA Report (DOE). • Guidelines on LD-P2M2 (DOE, 2017). • Guidelines for Erosion and Sediment Control in Malaysia (DID). • Manual Saliran Mesra Alam Edisi-2 (MSMA-2).
Flood/Runoff Management	• MSMA-2 requirements.

CRITERIA & STANDARDS FOR ENVIRONMENTAL PARAMETERS (cont.)

Impacts	Evaluation Criteria
Air Quality 	• Environmental Quality (Clean Air) Regulations 2014. • Malaysian Ambient Air Quality Standards (MAAQS).
Noise level 	• Guidelines for Environmental Noise Limits and Control (3rd Edition) (DOE). • Occupational Safety Health (Noise Exposure) Regulations 2019.
Vibration 	• The Planning Guidelines for Environmental Vibration Limits and Control (DOE).
Ecology 	• International Union on the Conservation of Nature (IUCN) and Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) listing. • Fisheries Act 1985. • National Forestry Act 1984 • Wildlife Conservation Act 2010. • Feedback from Department of Marine Park Malaysia, Department of Fisheries (DOF), PERHILITAN and Forestry of Department Peninsular Malaysia (JPSM) and local authorities.
Land use 	• Structure Plans, Local Plans, Special Area Plans (SAP). • Environmental Sensitive Area (ESA) Listing under the National Physical Plan-3 (NPP-3). • Requirements in the National Physical Coastal Zone Plan (NPCZP). • Local authority requirements. • Civil Aviation Authority of Malaysia Act 2017
Land Traffic 	• Acceptable level of service (LOS) for traffic flows. • Local authority requirement. • A Guide on Geometric Design of Roads – ATJ 8/86 (Pindaan 2015) – JKR Malaysia
Marine Traffic and Risk 	• Recommendations from the Marine Department of Peninsular Malaysia .
Socio-economy 	• Public perception on acceptability. • National Heritage Register (National Heritage Department), if applicable. • Preservation of cultural, heritage, historical, and archaeological items and sites of significance, if applicable.

CRITERIA & STANDARDS FOR ENVIRONMENTAL PARAMETERS (cont.)

Impacts	Evaluation Criteria
Socio-economy 	• Social Impact Assessment (SIA) requirements in the context of the Town and Country Planning Act (Amendment) 2017 (Act A1522) for three categories: **SIA Category 1**: Development projects under subsection 20B(1) and (2) of Act A1522 for coastal reclamation projects and major national infrastructure. **SIA Category 2:** Development projects under subsection 22(2A) Act 172 for new township development for population over 10,000 people OF covering area over 100 ha or both, major national infrastructure and development in slope and hill areas. **SIA Category 3:** Any other development projects with significant social impacts as ordered by the National Physical Planning Council (MPFN) from time to time. **Note: Refer to the Social Impact Assessment (SIA) Preparation Manual for Development Projects (2nd Edition) for the list of projects that require SIA preparation in Appendix D**
Safety and Health 	• Occupational Safety and Health Act 1994. • Factory and Machinery Act 1967. • Department of Safety and Health (DOSH) requirements. • International Labour Organisation (ILO) and other guidelines. Guidance Document on HIA in EIA (DOE). • EIA Guidelines for Risk Assessment (DOE).
Wastes 	**Scheduled wastes** Environmental Quality (Scheduled Wastes) Regulations 2005. **Other wastes** • Solid Waste and Public Cleaning Management Act 2007. • Local authority requirements. **Vessels** Marine Department of Peninsular Malaysia requirements - solid and scheduled wastes.
Visual Aesthetics 	• Public perception on acceptability.

Notes: The list is not exhaustive and not all the above may be relevant to the project The Project Proponent and Qualified Person shall make reference to the latest standards and requirements by the authorities.

1 ECOLOGY

ASSESSMENT REQUIREMENTS

- Inventory of existing flora and fauna (terrestrial, aquatic, estuarine and marine) in the project area and surrounding impact zones to ascertain the level of biodiversity.
- For habitat assessment such as coral reefs, the extent and conditions of the reef needs to be ascertained. If it involves a large area, sonar methods and other mapping techniques can be carried out to determine the substrate and live coral cover, supplemented with spot diving to verify the findings. In marine parks, coral transects may have to be laid to gather data.
- Identification of critical species benchmarked with the lists published by the International Union for Conservation of Nature (IUCN) red list or similar references.
- The assessment can be based on field surveys (coral transects, dive observations, animal trapping, baiting, camera traps, and observations of secondary animal signs) or literature review to produce the inventory.
- Camera trap methods and direct/indirect observations are encouraged to use. These two methods do not involve contact with wildlife which can threaten wildlife if the operator is unskilled. Any installation of wildlife traps requires a Special Permit from the Department/Ministry.

EVALUATION CRITERIA

- Indication of possible loss of habitat and its flora and fauna, which may include endemic, rare, endangered, threatened and/or near extinct species.
- Project activities that could disturb animal behaviour, leading to their dispersal or limiting their range.
- Potential impacts from pollution such as sediment plume, nutrients, sewage and oil spills on the ecosystem

OUTPUT

- Highlight important areas (through the habitat map) which should not be built-upon, or if there is no other option, to determine suitable mitigation measures to minimise the impacts or replace the lost area.
- Identification of critical areas to incorporate mitigation measures such as viaducts to allow far safe passage of animals or need to translocate important species at risk from the project, and how to go about it.

2 HYDROLOGY AND/OR HYDRAULICS

ASSESSMENT REQUIREMENTS

- Levels of change due to the aerodrome projects on the local hydrology and hydraulics in terms of waves, water level, current velocity, sediment transport etc.
- The long term impacts shall be addressed and assessed

EVALUATION CRITERIA

- Carry out hydraulic study to develop a model of the hydrological and hydrodynamic conditions of the coastal areas around the project site,
- Developed scenarios to assess the impacts from the project under different conditions such as the construction and operation phase, tidal conditions, and seasonal changes.
- Determine the extent of change for waves, water level, currents, sediment transport, etc.

OUTPUT

- Visual maps representing the degree of change of the coastal parameters under different conditions.
- Assessment of the revel of change at the sensitive receptors to determine potential impacts.
- Identification of the best construction method, layout and conditions that will minimise impacts.

3 EROSION & SEDIMENTATION (including Sediment Plume)

ASSESSMENT REQUIREMENTS

- Assessment of the scale of land clearing and removal of vegetative cover at the site to determine the rate of erosion.
- Assessment of the conditions of the hydrological and drainage systems and how they may be altered as streams and rivers are diverted and/or become silted up, leading to increased runoff volume and velocity while their retention time and infiltration rates are reduced.
- Similarly, assess erosion and sedimentation that will likewise affect the aquatic ecology and water pollution downstream.
- Determine existing coastal morphology and landforms, to ascertain the erosional and accretion areas.
- Determination of potential project activities that may result in generation of sediment plumes, e.g. dredging, filling works, piling works etc.
- Assessment of the severity and extent of the sediment spread in the coastal waters, which lead to water quality deterioration affecting sensitive receptors such as coral reefs, fishery areas and recreational and tourism sites, among others.
- Ascertain the level of change to the coastal morphology due to construction and identify risk areas that may require protection structures.

EVALUATION CRITERIA

Land erosion and sedimentation:

- Calculate the rate of soil erosion and sediment yield using standard formulae and site specific information (surveys, soil particle analysis, terrain characteristics, hydrological data, etc.), to determine the extent of erosion and sedimentation as a result from land clearing
- Provide erosion scenarios such as with or without mitigation measures in the assessment.
- Run simulation to determine the best management practices (BMPs) that shall be adopted to minimise the negative effects

Sediment plume:

- Using hydraulic and hydrodynamic models, with the data obtained of the project site and surroundings, to model different scenarios to determine the extent of sediment plume generated and the level of suspended solids.
- Included in the scenario with and without mitigation measures such as silt curtains, sand containment bund, rock bund, etc. and analyse the effectiveness of the mitigation measures.
- Coastal monitoring survey can be proposed or carried out to determine the changes of the shoreline during and after construction phase.

OUTPUT

- Avoidance principles can be applied to the design and layout of the project to avoid sensitive areas or in designing technical and engineering solutions to minimise erosion and sediment plume.
- Identify suitable BMPs to be incorporated in the project through the land-disturbing and pollution prevention and mitigation measures (LD-P2M2) based on the modelling results and also P2M2 for sediment plume control.
- Identify buffers and setbacks for structures due to changes in the coastline.

4 WATER QUALITY

ASSESSMENT REQUIREMENTS

- Assessment of the types and scale of impairment to water quality of the nearby rivers and coastal waters at the project site and the surrounding areas due to aerodromes project.
- Determine the potential sources that include sedimentation from construction works, sewage and sullage discharge from worker quarters and oil and grease (O& G) spills.
- Determine the extent of sediment plume spread under the different coastal conditions and their impacts on marine sensitive areas.
- During operations, improper treatment of sewage can also contribute to increased nutrients into the coastal waters, leading to their ecological degradation and thus its impacts on users need to be ascertained.

EVALUATION CRITERIA

- There is a variety of models to determine pollution loadings in the rivers and waterways. Choose the most suitable model to simulate the loading and determine the magnitude and extent of the impacts further downstream especially for key water pollutants indicators [biochemical oxygen demand (BOD), ammoniacal nitrogen (AN) and coliform].
- At the project site, identify potential water polluting sources (toilets, worker quarters, canteen, batching plant, workshops, etc.). This will determine the development of BMPs for the site,
- Determine impacts from sediment plume (see also Erosion and Sedimentation) at the project site and surrounding areas.
- Determine whether the pollution load will affect any sensitive receptors.

OUTPUT

- Suitable BMPs and treatment systems shall be identified to minimise the effects of discharges to the waterways, e.g. silt traps (on land only), sewage treatment systems, silt curtain, etc.
- Effectiveness of the BMPs can be simulated to estimate load reductions, ensuring pollutants are controlled at-site to reduce offsite impacts to meet the requirements and standards of various agencies.

5 AIR QUALITY AND NOISE

ASSESSMENT REQUIREMENTS

- Air Quality: Identification of potential air pollution generating sources from the project site and nearby sensitive receptors that may result in elevated dust levels and dispersions from construction and rock blasting works.
- Consider the aspects of the development that are likely to lead to air emissions. Such aspects will include aircraft emissions, volatiles from aircraft cleaning / paint stripping and land-based transport emissions.
- Noise Levels: Assessment of high ambient noise environment and activities that pose impairment hazards to the workers and any nearby receptors from machineries and equipment on-site. Underwater noise impacts shall also be ascertained if there are any underwater project activities that may result in increase in noise levels e.g. piling, dredging, etc.

EVALUATION CRITERIA

- Air Quality: Air quality models are mainly Gaussian-based and many are available in the market. Use the most suitable one to simulate the air pollutant dispersion patterns and map it to determine the range of impacts.
- Noise Levels: This again can be modelled or calculated based on increase in noise levels, mapped as noise contours over a given area.

OUTPUT

- Both model simulations can identify the extent of the effects from a pollution source, the level of pollutants at nearby receptors and the potential effects of these pollutants.
- Critical levels for pollutants at sensitive receptors shall be identified to be mitigated to ensure the levels are within acceptable limits and to ensure those working in such areas are protected against.

6 WASTE MANAGEMENT

ASSESSMENT REQUIREMENTS

- Identify the types of wastes generated during construction and operation phase such as biomass, scheduled, construction, domestic and municipal wastes and their impacts.

EVALUATION CRITERIA

- Identify and estimate the quantum of all waste sources with the assistance of the technical and engineering consultants.
- Assess the severity of impacts from improper management of such wastes on water quality (leachate), odour, air quality and public health.
- Location of potential storage areas within the project site,
- Identify locations where the wastes will be eventually disposed.

OUTPUT

- Identification of proper temporary disposal sites and storage facilities for wastes generated on-site including mitigation measures against spillage and other impacts.
- Mitigation measures for proper waste management to be incorporated project site management to ensure that all wastes are properly managed and disposed at designated locations so as not to pollute the environment.

7 HUMAN ENVIRONMENT

ASSESSMENT REQUIREMENTS

- Determine whether there is land and property acquisition and relocation of communities (e.g., Orang Asli).
- Assess the views and perception of the affected stakeholders and their inputs, recommendations and requirements of the project and mitigation measures to address their concern.
- Assessment of impacts to coastal users, i.e. fishermen, aquaculture farms, tourism operators, etc. and any other impacts to these groups that may need addressing.
- Determination of coastal capacity is crucial. Future activities shall not exceed the carrying capacity, which may result in deterioration of the environment, increase in utility and amenity demand, impair natural resources and degrades the quality of tourism and recreational services.

EVALUATION CRITERIA

- Land and property acquisition and relocation of communities must be first be settled by the Project Proponent prior to EIA commissioning and submissions.
- For the EIA, the impacts are evaluated mainly on the communities living within the Zone of Study (ZOS) if there is a need, those in the ZOI will also be assessed in terms of the impacts on them.
- Statistical reliability should be taken into consideration.
- The main findings from the Social Impact Assessment (SIA) shall be incorporated in the EIA.
- For the case of marine parks, the carrying capacity and also impacts on tourism and recreation shall also be assessed.

OUTPUT

- The findings from the human environment, mainly from surveys and focal group discussions (FGDs) are contentious and often skewed. Therefore, the assessments should have overall on-the-ground reviews even after the surveys are interpreted by the Qualified Person.
- Assessment of the carrying capacity of the coastal areas and marine parks to determine any exceedance, including the increase in infrastructure, amenities and utilities to sustain the increase in people and tourists during and post-construction.

8 LAND AND MARINE TRAFFIC

ASSESSMENT REQUIREMENTS

- Description of how construction materials, workers and machinery are mobilised to/fro from the construction site. Higher vehicle volumes can cause congestion, damaged roads, material spillage and increased risk of road accidents.
- Marine traffic from vessels bringing in construction materials and anchoring at the project site, will increase the risk of congestions causing higher risk of collisions with other vessels such as tourist/fisherman boats.

EVALUATION CRITERIA

- To study and incorporate the main findings from the land and marine traffic assessments in the EIA. The Traffic Impact Assessment (TIA) is carried out separately by a Traffic Consultant and endorsed by the Public Works Department (JKR).
- The Marine Risk Traffic Assessment (MRTA) is carried out by a Qualified Person and the report submitted to the Marine Department of Peninsular Malaysia.
- The main concern in the EIA (risk to accidents, air quality, public health), are communities living along the coastal areas during construction.
- During the operation phase, the extra volume of traffic generated by the project will also affect the same communities and the tourists.

OUTPUT

- Potential issues related to land and marine traffic and incorporation of structural and non-structural measures to address the issues as proposed in the TIA and MRA.
- Identification of risk factors from various activities to communities and tourists such as from accidents, health, etc.

9 SAFETY AND HEALTH

ASSESSMENT REQUIREMENTS

- Construction entails higher risks to the safety and health of the workers and any surrounding communities from pollution, diseases, accidents and hazards, and these risks are to be assessed.

EVALUATION CRITERIA

- Use risk assessment models to ascertain the level of risk from specific activities.
- Determine the level of risk to neighbouring receptors to ascertain whether the level is within acceptable levels.
- In terms of health, surveys on existing health conditions of receptors can assist in monitoring for sudden decrease in community health during pre- and post- project implementation.

OUTPUT

- The qualitative/quantitative risk to receptors can assist to determine the types of BMPs necessary to reduce the risks.
- Findings from the Health Impact Assessment (HIA) can also provide possible preventive and mitigation measures to safeguard worker and community health during construction and operation.

6 ENVIRONMENTAL IMPACT ASSESSMENT: MITIGATION MEASURES

This Chapter shall focus on Pollution Prevention and Mitigation Measures (P2M2s) that serves to address the significant adverse environmental impacts identified during the scoping exercise and impact assessment phases of the Environmental Impact Assessment (EIA). The mitigation measures provided in this Chapter shall serve as a guide only.

The implementation of P2M2 is intended to achieve the following:

- Avoidance of negative impacts through selection of alternatives to implement the preventive measures.
- When an impact cannot be avoided, to adopt effective and practical mitigation measures to minimise the impacts.
- Enhance and amplify the beneficial impacts.
- Ensure that residual impacts are kept within acceptable levels.

The Qualified Person shall also propose best management practices (BMPs) based on the findings of the EIA for the project site.

General P2M2s and BMPs

The Qualified Person shall identify and incorporate into the EIA, any additional P2M2 and BMPs required to mitigate significant impacts from the project site.

The Project Proponent and Qualified Person shall recommend alternative measures and/or introduce newer technology whenever these are proven more effective. At the EIA stage, the P2M2 shall be detailed out as best as possible and reported in the EIA Report.

PRINCIPLES AND ADOPTION OF P2M2s

1. The need and extent of P2M2s required shall correspond to the significance predicted impacts. Once an issue is identified as significant, P2M2s must be identified and elaborated on in detail in the EIA . For minor issues, management actions and simple measures need only be highlighted.

2. Priority shall be on control at source (e.g. use of erosion control covers on slopes and platforms to reduce erosion) and rectifying the effects (e.g. maintenance on silt traps and removal of accumulated silt from drainage).

3. Solutions shall be project-specific and designed for the site conditions instead of using generic solution proposals. The P2M2s need not be complex and costly, but shall instead be practical, easy to implement and effective.

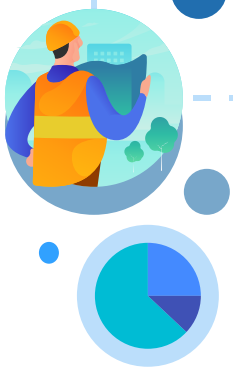
4. The EIA shall include adequate explanation on the design and function of a P2M2, supported by diagrams, illustrations, photos and maps. The technical reports and specifications shall be included in the appendix of the EIA.

5. The use of new technology is encouraged if it can be proved to be effective in mitigating the impacts. The Project Proponent or the Qualified Person is responsible to provide proof and supporting evidence that the proposed technology is tried and tested and able to address the impacts.

6. P2M2s requires regular inspection, maintenance and rehabilitation and these shall be incorporated as part of the management requirements of the project, including the allocation of adequate budgets for such purposes.

7. Effectiveness of P2M2s shall be documented is through implementation of a comprehensive monitoring programme.

LAND-DISTURBING POLLUTION PREVENTION & MITIGATION MEASURES(LD-P2M2)



LD-P2M2 is a newly mandated requirement by DOE under the mainstreaming environmental agenda to effect a paradigm shift towards a culture of self-regulation (SR), placing the onus of environmental protection clearly on the Project Proponent to implement and comply.

The LD-P2M2 is required as long as there are any land disturbing activities, subject to Section 34A of the EQA 1974, carried out during project development.

The LD-P2M2 forms an integral part of the EIA process and must be taken into account during the project planning cycle to ensure that the recommendations in the document are incorporated into the project.

During project implementation, it shall act as a reference document for the Project Proponent, contractors and Environmental Officer (EO) in implementing P2M2s and BMPs on-site, and in facilitating monitoring, audit and enforcement.

The Guidance Document for the Preparation of the Document on Land-Disturbing Pollution Prevention and Mitigation Measures (LD-P2M2) in Appendix 4 of the EGIM (DOE, 2016) and "Guidelines on LD-P2M2 by DOE" (2017) shall be referred in the preparation of the LD-P2M2.

LD-P2M2 Principles

The LD-P2M2 is to be prepared and endorsed by a DOE registered consultant who holds a certification issued by DOE, as a professional for erosion and sediment control (CPESC).

The basic principles to develop the LD-P2M2 shall include:

1. Integration of project design with site constraints
2. Preservation and stabilisation of drainage and waterways.
3. Minimise the extent and duration of disturbance.
4. Control of runoff flows into, through and from the site via stable drainage structures.
5. Installation of perimeter controls.
6. Stabilisation of disturbed areas in a timely manner.
7. Protection of steep slopes.
8. Use of sediment controls to prevent off-site damage.
9. Protect inlets, storm drain outfalls and culverts.
10. Provide access and general construction controls.
11. Inspect and maintain BMPs for control measures.
12. Employ experienced and competent persons for monitoring and consistently conduct relevant.

LD-P2M2

STANDARD REQUIREMENTS AND SUBMISSION CHECKLIST

The LD-P2M2 report shall include all required information in the LD-P2M2 Submission Checklist tabulated below, accompanied by relevant technical drawings and maps.

The Project Proponent is required to make a legal pledge to undertake efforts, measures, actions or due diligence in accomplishing the overarching goal of protecting the environment and in mitigating the adverse environmental impacts in the process of the proposed project development.

LD-P2M2 Submission Checklist

REQUIREMENTS	INFORMATION TO BE INCLUDED
Project Activity & Implementation	• Phasing plan. • Project implementation schedule. • Description of construction activities. • Construction schedule complete with timeline or charts for P2M2s installation. • Construction method statements.
Information & Analysis on Project Development	• Selected weather and rainfall data. • Site runoff velocity and flow rates (pre and post-development). • Description of site soil and geological characteristics (type, erodibility, hydrologic group, percentage dispersible material, excavation depth, etc.). • Description of adjacent areas that may be affected by land disturbance. • List of drainage, streams and river onsite as well as receiving streams and rivers. • List of P2M2s proposed. • Access roads and project components located outside of project boundary. • Earthworks cut and fill volume. • Availability of rocks materials. • Biomass management. • Solid (construction waste) and domestic waste management. • Spill prevention and control plan. • Hazardous waste management. • Soil loss prediction (pre, during and post-development) for with and without LD-P2M2 implementation scenarios. • Calculation for sediment traps/basins and projected runoff flows.
Map of Site Plan with Existing Conditions	• Topographic survey map. • Geological Terrain Map. • Erosion risk map. • Landuse map. • Site development plan map.

Source: Guidance Document for the Preparation of the Document on LD-P2M2, DOE, 2016.

P2M2 for Aerodrome Projects

P2M2 for Aerodrome Development

1. Pre-construction stage
2. Construction stage
3. Operational stage

1 P2M2 DURING PRE-CONSTRUCTION STAGE

Activities	Issues	P2M2
Site surveys including topography, bathymetry survey, soil investigation and environmental assessment	**Ecology**	• Ban on poaching/hunting • Any sightings of rare, endemic, threatened, near extinct and endangered flora and fauna are to be notified to the relevant authorities such as the Forestry Department of Peninsular Malaysia (JPSM), Department of Wildlife and National Parks Peninsular.
	Safety & Health	• Provide Personal Protective Equipment for workers. • Proper handling of waste management.
Land Acquisition (if any) under SIA and local authorities' scope	**Socio-economy**	• Generate more employment and multifacet economic benefits

Note.: The list is not exhaustive and not all the above may be relevant to the project, It is the responsibility of the Project Proponent and Qualified Person to determine the relevant information required for environmental assessment and compliance.

Wildlife Monitoring using a Camera Trap

Site Survey

Soil Investigation

2 P2M2 DURING CONSTRUCTION STAGE

Activities	Issues	P2M2
• Establish access road • Site clearing • Setting up site facilities and base camp • Establish vessel facilities (if applicable) • Mobilisation of equipment and materials • Earthworks • Infrastructure works • Structural works • Waste disposal • Establishment of permanent access • Final finishing and landscaping	**Ecology** 	• Construction activities are to be confined to within the designated work area and remaining areas to be untouched. • Where necessary structural measures are to be put in place to reduce the impacts of forest fragmentation and allow safe passage for animals. • Ban on poaching/hunting • Wildlife management plan • Wildlife conservation awareness program for the construction workers. • Designate vessel traffic lanes and anchorage areas. • Any sightings of rare, endemic, threatened, near extinct and endangered flora and fauna are to be notified to the relevant authorities such as the Forestry Department of Peninsular Malaysia (JPSM), Department of Wildlife and National Parks Peninsular Malaysia (PERHILITAN) and/or Department of Fisheries (DOF)/ Marine Park Division or local approving authorities for appropriate actions.
	Wastes 	• Proper waste management in handling domestic, scheduled waste and construction waste. • Provide waste bins and disposed at approved dumpsite • Regularly maintained good housekeeping • Scheduled waste storage area with sufficient bunding, labelling and waste inventory.
	Water Quality 	• Establishment of LD-P2M2 • Septic tank and toilet facility at workers camp as per SPAN requirements. • Establish proper workshop area. • Proper management in handling the scheduled waste. • Vessel management and requirements for pollution control measures. • Oil spill management plan and provision of oil spill kits.

2 P2M2 DURING CONSTRUCTION STAGE (cont.)

Activities	Issues	P2M2
• Establish access road • Site clearing • Setting up site facilities and base camp • Establish vessel facilities (if applicable) • Mobilisation of equipment and materials • Earthworks • Infrastructure works • Structural works • Waste disposal • Establishment of permanent access • Final finishing and landscaping	**Erosion and Sedimentation/ Coastal Erosion** 	• Development phasing. • Retain as much of the natural vegetation as possible. • Reducing the total area and period of exposure of the worked terrain to a minimum. • Construct drainage network to channel runoff from the site. • Ensure that any discharge from the project site is properly channelled into a treatment system (i.e., sediment basin, silt trap, etc) before final discharge to any waterways. • Stabilise disturbed areas and apply protection measures as soon as practicable. • Establishment of LD-P2M2 • Proper construction methods for marine construction. • Coastal protection requirements.
	Hydraulic and Hydrodynamics 	• Preservation of existing waterways, drainage and buffers as much as feasible. • Structural and non-structural measures can be adopted to reduce runoff velocity, increase retention time within the site and manage the volume of runoff to nearby waterways. • The hydraulic study shall assess all aspects of the project (layout, design, components, etc.) to assess the impacts and the recommendations of the study shall form the basis for the mitigation measures (coastal barriers, breakwaters, etc.)
	Air Quality 	• Provision wheel washing facilities. • Frequent wetting the ground • Measures to reduce equipment and vehicular emissions. • Employing the use of covered vehicles for transportation

Mulching

Earth Drain

Check Dam

Silt Trap

Sediment Basin

Slit Fence and Gabion

Sediment Forebay

Geomat / Fiber Blanket

2 P2M2 DURING CONSTRUCTION STAGE (cont.)

Activities	Issues	P2M2
• Establish access road • Site clearing • Setting up site facilities and base camp • Establish vessel facilities (if applicable) • Mobilisation of equipment and materials • Earthworks • Infrastructure works • Structural works • Waste disposal • Establishment of permanent access • Final finishing and landscaping	**Noise** 	• Perimeter hoarding • Scheduling of piling • Regular maintenance for machinery and vehicle • Personal Protective Equipment for workers
	Land Traffic 	• Traffic management plan • Speed limits
	Marine Traffic 	• Issuance of Mariner's Notice during construction • Deploy navigational aids such as lighting and buoys to demarcate the work area and warn others not to trespass • Regular maintenance on Vessel
	Safety and Health 	• Provide Personal Protective Equipment for workers • Housekeeping and Standard Operating Procedure
	Socio-economy 	• Constantly monitor and supervised foreign workers • Set up a community centre

Note: The list is not exhaustive and not all the above may be relevant to the project, It is the responsibility of the Project Proponent and Qualified Person to determine the relevant information required for environmental assessment and compliance.

MITIGATION MEASURES DURING CONSTRUCTION PHASE

Erosion Control

Gabion placed along the river to control soil washout into the river.

Dust Control

Provision wheel washing facilities.

Waste Management

Proper waste management in handling scheduled waste.

Sediment Control

Discharge from the project site is properly channelled into a sediment basin before final discharge to any waterways.

Coil Logs

Wheel Washing Facilities

Water Browser

Temporary Noise Barrier

Site Office

Turfing

Worker Quarters

3 P2M2 DURING OPERATIONAL STAGE

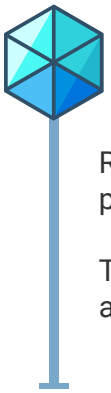
Activities	Issues	P2M2
• Aerodrome Operation • Aircraft and ground support equipment maintenance and repair • Aerodrome Operation • Aircraft and ground support equipment maintenance and repair	**Ecology**	• Wildlife conservation awareness program for the staffs/ workers. • Any sightings of rare, endemic, threatened, near extinct and endangered flora and fauna are to be notified to the relevant authorities such as the Forestry Department of Peninsular Malaysia (JPSM), Department of Wildlife and National Parks Peninsular Malaysia (PERHILITAN) and/or Department of Fisheries (DOF)/ Marine Park Division or local approving authorities for appropriate actions. • Install Bird Control Radar System • Avoid building airports on migratory bird route. • Ensure bird perched areas are maintained to prevent birds from resting in the area near the airport. • Ensure river water (if any) flows and is not static to prevent birds from hunting fish. • Ensure water reservoir area is reduced. • Maintain field/grassy areas to avoid attracting birds there.
	Water Quality	• Sewage and sullage to be treated prior discharge to waterways (i.e., STP). • O&G traps in canteens and kitchens. • Improve the drainage in strategic location that are potentially facing with the leaks and spills of chemicals and fuels problem by using an oil / water separator to discharge from the surface. • Proper management in handling the scheduled waste from the maintenance activities.
	Stormwater Management	• Permanent drainage network and retention systems (e.g. detention ponds, dry ponds, rain harvesting system, etc.) to be installed at-site to capture runoff from the site.
	Traffic	• Transportation and accessibility as the highway network system, inter-urban, road and rail transport to be upgraded and extended to support the Project.

3 P2M2 DURING OPERATIONAL STAGE (cont.)

Activities	Issues	P2M2
• Aerodrome Operation • Aircraft and ground support equipment maintenance and repair • Aerodrome Operation • Aircraft and ground support equipment maintenance and repair	**Noise** 	• Landscaping • Establish an action plan to reduce noise. • Restrictions of the night time and operation of aircraft activities should be controlled. • Reducing noise in flight operations and activities or use the sound barriers and deflectors to eliminate and reduce noise.
	Air Quality 	• All emissions from vehicles and fuel burning equipment must abide by the emission standards of DOE. • Optimizing and improving the ground service infrastructure to reduce aircraft and ground vehicle movements • Introduction of charges to promote the use of lower emission aircraft. • Airport operating practices designed to reduce aircraft idling times.
	Wastes 	• Proper waste management in handling domestic and scheduled waste from aerodrome operation/maintenance activities. • Encourage a recycling program or use biodegradable materials that will be dispose easily especially food container, plastic bags and so forth.
	Socio-economy 	• Constantly monitor and supervised foreign workers • Set up a community centre
	Safety & Health 	• Safety or warning signage • Implementing strict health and safety procedures for waste handlers • Installation of adequate fencing and other site security to prevent trespassing and vandalism.
	Risk 	• Emergency Response Plan(ERP) by airport operators to put in place with participation of a stakeholders. • Emergency Response Plan (ERP) to be practiced with the nearby communities to ensure that they are aware when such event (aircraft crash) occurs.

3 P2M2 DURING OPERATIONAL STAGE (cont.)

Activities	Issues	P2M2
• Aerodrome Operation • Aircraft and ground support equipment maintenance and repair • Aerodrome Operation • Aircraft and ground support equipment maintenance and repair	**Land use** 	• Surrounding landuse which are not compatible should be avoided for future development. • Determine the appropriate landuse control for areas within the 60dBA noise contour and Public Safety Zone (PSZ) identified.



Residual Impacts

Residual impacts include the remaining impacts that will persist even after implementation of all mitigation measures.

The extent of residual impacts needs to be clearly assessed and detailed in the EIA report.

MITIGATION MEASURES DURING OPERATIONAL PHASE

Noise Barrier

Sound barriers and deflectors to eliminate and reduce noise.

Bird Control Radar System

Landscaping

Landscaping that bounces plane noise back into the sky.

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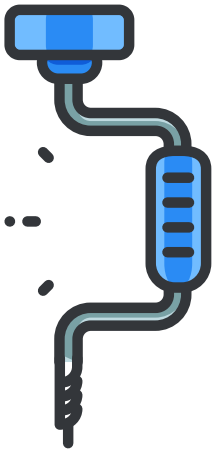
7 ENVIRONMENTAL IMPACT ASSESSMENT: ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (EMP) is a legal document prepared by the Project Proponent, incorporating the Land-Disturbing Pollution Prevention and Mitigation Measures (LD-P2M2), other pollution prevention and mitigation measures (P2M2s) and best management practices (BMPs) as recommended in the Environmental Impact Assessment (EIA), including the Conditions of Approval (COA) by the Department of Environment (DOE).



The EMP shall function as a project implementation tool for the Environmental Management Team to carry out mitigation works on-site. The key contents of the EMP are required to be translated into a format for incorporation into the Bill of Quantities (BQ) for the work scopes of the contractors during construction and operations.

Other than mitigation measures, the EMP shall include an environmental monitoring and audit programme to assess the effectiveness of the P2M2s implementation. The EMP is a living document and has to be updated if there are major changes to the project design, layout or method statement that may result in impacts to the environment.

LEGAL ADHERENCE

Section 34 A (6)

Any person intending to carry out a prescribe activity shall not carry out such activity until the report required under this section to be submitted to the Director General has been submitted and approved.

Section 34 AA (2)

The prohibition order to stop work order may be issued for the purpose of preventing the prescribed activities from continuing—

(a) either absolutely or conditionally;
(b) for such period as the Director General may determine or
(c) until requirements to remedy as the Director General may direct have been complied with.

Section 34 AA (1)

The Director General may issue a prohibition order or stop work order to the person carrying out the prescribed activities—

(a) without the approval under subsection 34A(3);
(b) who violates any conditions attached to the approval of the report; or
(c) which in the opinion of the Director General are being carried out in a manner that is likely to cause environmental damage.

Section 34 A (8)

Any person who contravenes this section shall be guilty of an offence and shall be liable to a fine not exceeding five hundred thousand ringgit or to imprisonment for a period not exceeding five years or to both and to a further fine of one thousand ringgit for every day that offence is continued after a notice by the Director General requiring him to comply with the act specified therein has been served upon him.

Section 34 A (7)

If the Director general approves the report, the person carrying out the prescribed activity, in the course of carrying out such activity, shall provide sufficient proof that the conditions attached to the report (if any) are being complied with and that the proposed measures to be taken to prevent, reduce or control the adverse impact on the environment are being incorporated into the design, construction and operation of the prescribed activity.

Section 34 AA (3)

Any person who contravenes this section shall be guilty of an offence and shall be liable—

(a) to a fine not exceeding five hundred thousand ringgit or to imprisonment for a period not exceeding five years or to both; and
(b) for a continuous offence, to a fine not exceeding one thousand ringgit for every day during which the offence continues after a notice has been served by the Director General upon the person requiring the person to comply with the act specified in it.

EMP FRAMEWORK

In the EIA phase, the project may not have sufficient detailed information on the project work plan to produce a comprehensive EMP. The EMP chapter in the EIA will only be an EMP framework for eventual morphing into a full EMP after the EIA approval stage.

The Project Proponent can decide to undertake the detailed EMP at the same time as the EIA Report and both can be submitted concurrently. The EMP can later be updated to incorporate the requirements of the COAs.

The EMP format, shall be based on the requirements stated within the Environmental Impact Assessment Guideline in Malaysia (EGIM) (DOE, 2016), and shall contain details of the LD-P2M2 Document and proposed monitoring and audit programme.

The main topics required to be incorporated into the EMP framework shall include the following:

The Project Proponent shall be required to identify and setup an Environmental Management Unit (EMU) to ensure that all EIA Conditions of Approval (COAs) and P2M2s are implemented during the construction and operational phases of the project.

For large-scale projects involving multiple packages, the respective main contractors are required to have their respective Environmental Teams (ETs) with minimum personnel comprising an Environmental Manager (EM) and Environmental Officer (EO).

The organisation chart along with the roles and responsibility of all parties in charge of environmental management for the project shall be included in the EMP framework.

ENVIRONMENTAL COMMUNICATION

The mode of communication between the EMU and the respective ET must be clearly defined. Lines of communication between the Project Proponent and EMU with the relevant stakeholders must be clearly spelled out, these is not only limited to project site management but also in engagements with affected communities and the general public.

MONITORING & AUDIT PROGRAMME

The environmental monitoring and audit programme are important components of the EMP. Monitoring and audit shall be implemented during the post-EIA stage.

MONITORING CATEGORY

Environmental monitoring can be categorised into three main types:

01

PERFORMANCE MONITORING (PM)

- Relates to the monitoring of the performance treatment systems such as industrial effluent treatment systems (IETS), sewage treatment systems (STS) and air pollution control systems (APCS).
- This shall be undertaken by a Competent Person with expertise in the related treatment system.

02

COMPLIANCE MONITORING (CM)

- Relates to the monitoring of P2M2s within the site and their performance. Measurements are usually taken either of the ambient parameters (water, air and noise) or of the discharge (sewage, sediment basin).
- This task shall be carried out by a Qualified Person such as the Environmental Officer (EO) and/or the Environmental Consultant.

03

IMPACT MONITORING (IM)

- Impact monitoring may only be required in cases where there is a possibility that the impacts may still affect receptors outside of the project boundary despite implementation of P2M2s.
- This task must be carried out by a Competent Person associated with the accredited laboratory.

The monitoring locations and frequencies, parameters to monitor, recommended limits, instrumentation and personnel requirements shall need to be identified in the EMP framework.

MONITORING METHODOLOGY

The extent of monitoring shall be determined by the scale of the project and of the predicted impacts. Monitoring covers both within the project site and outside of its boundary where impacts are perceived to affect sensitive receptors.

Details of the monitoring programme are to be decided upon by the Qualified Person or Environmental Consultants, and be included in the EIA to be approved by DOE before implementation. For specific projects, the monitoring programme shall be required to be tailored to the site conditions and type of development.

ENVIRONMENTAL AUDIT

Environmental auditing is a post-EIA evaluation process to determine compliance to the COAs by the Project Proponent.

Audit requirements are guided by the requirements in the Environmental Audit Guidance Manual by DOE. The audit must be undertaken by an independent party as a DOE registered auditor.

The typical audit process involves:

PRE-AUDIT

Preparation of a pre-audit checklist and information request to the auditee. Submission of a notification of audit to DOE.

ON-SITE AUDIT

Briefing to the auditee by Lead Auditor. Audit shall include documentation review, site inspection, interviews with relevant personnel to obtain the necessary information to gauge compliance and site sampling (optional). Auditee will be briefed at the Closing Meeting with the on-site Audit Summary submitted to the state DOE.

POST-AUDIT

Lead Auditor shall submit an Audit Report to the state DOE and the Project Proponent to respond with a Corrective Action Report (CAR) within three weeks from the audit date.

REPORTING

The EMP framework shall contain a proposed reporting schedule for the various submissions post-EIA which shall include, but not limited to:

- Environmental Compliance Reporting
- Monitoring
- Auditing

SELF-REGULATION

Environmental Mainstreaming (EM) is a strategic tool that allows for the cultural evolution of embracing the environmental agenda at all levels of the organisational structure of the Project Proponent.

With the understanding of EM, all key personnel in an Organisation can play a role in safe guarding our environment in an effective manner. As such, the elements as espoused in the EM Tools (EMT) provide a Guide in achieving the ultimate Goal of Environmental Excellence in an Organisation.

8 ENVIRONMENTAL IMPACT ASSESSMENT: REPORTING AND REVIEW

This chapter provides the required format for Environmental Impact Assessment (EIA) report preparation for submission to the Department of Environment (DOE) for approval of study.

EIA REPORT

An EIA shall be written in a concise manner that is easy to understand and be able to convey the main message to the decision makers.

The Environmental Impact Assessment Guideline in Malaysia (EGIM) (DOE, 2016) provides the specifications and format for EIA reporting.

EIA REPORT FORMAT

1. DECLARATION

Declaration from the Project Proponent & Qualified Person(s) in the format detailed in Appendix 9 of EGIM (DOE, 2016)

2. EXECUTIVE SUMMARY

Executive Summary of the EIA Report in Bahasa Malaysia and English.

3. INTRODUCTION

Brief introduction to the project, Project Proponent (address, key person and contact information), Environmental Firm (address, key person and contact information) and EIA Team Members (name, academic qualifications, areas of study, signature).

4. POLICY, REGULATORY & LEGAL REQUIREMENT

Review of the policy, regulatory & legal requirements for the project.

5. TERMS OF REFERENCE (TOR)

Terms of Reference (TOR) for the EIA Study as endorsed by the DOE. Endorsement letter from DOE to be attached as appendix to the EIA report.

6. STATEMENT OF NEED

Statement of need for the project.

7. PROJECT OPTIONS

Deliberation on the alternatives and project options.

EIA REPORT FORMAT

8. DESCRIPTION OF THE PROJECT

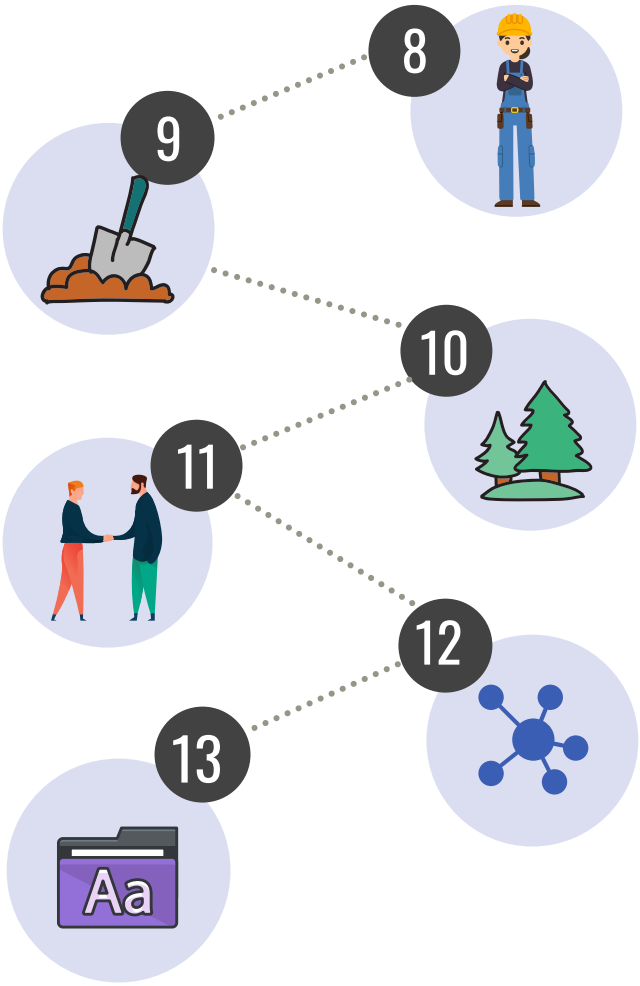
Detailed description of the project including site information, concept and breakdown of major components, material and manpower requirements, project activities and time schedule (refer to **Recommended Project Description in EIA Report** overleaf)

9. BASELINE CONDITION

Description of the baseline conditions (physical, chemical, ecology and socio-economy) within the Zone of Study (ZOS) that may be impacted by the project.

10. SIGNIFICANT IMPACTS

Assessment of the significant impacts (positive and negative), prediction of the extent and effects on nearby sensitive receptors and proposal of pollution prevention and mitigation measures (P2M2s) to minimise or enhance these impacts and any potential residual impacts.



11. PUBLIC CONSULTATION & ENGAGEMENT

Details & visual representation/ recordings of public consultation and engagement as part of EIA requirements.

12. EMP

Environmental Management Plan (EMP) incorporating the Land-Disturbing Pollution Prevention and Mitigation Measures (LD-P2M2), monitoring and audit programme.

13. APPENDICES

Appendices containing technical studies, supporting documentation, results of analysis, list of references, etc.

*An EIA Checklist can be referred in **Appendix E***

Recommended Project Description in EIA Report

1 Project Details

- Project title.
- Name and contact details of the Project Proponent (contact person, address, telephone number, e-mail address).
- Name of registered EIA Consulting Firm (EIA Team Leader, address, telephone number, e-mail address).
- Location of project (coordinates, lot no, district, etc.).
- Relevant map showing project location and accessibility.

2 Location

- General site plan including Zone of Study (ZOS) (5-km radius from project boundary and/or 1-km corridor [0.5 km on either side along the Right of Way (ROW) for linear projects].
- Project boundary and layout including boundary coordinates.
- Description of location in relation to identifiable landmarks (e.g. city centres, main roads, towns, etc.).

3 Project Component & Design Details

- Project details (land area, buffer requirements, lots and land status).
- Project concept.
- Project components.
- Technology use.
- Examples of similar project type and scale.

Note: The above shall be supported with technical drawings, illustration and

4 Project Activities

- Method statement to be provided for major project activities during pre-construction, construction and operational stages.
- Manpower requirements.
- Resource requirements (e.g. soil and aggregate sources, spoil disposal area, etc.).

5 Infrastructure, Utilities & Amenities Requirement

Details of the estimated demand for:

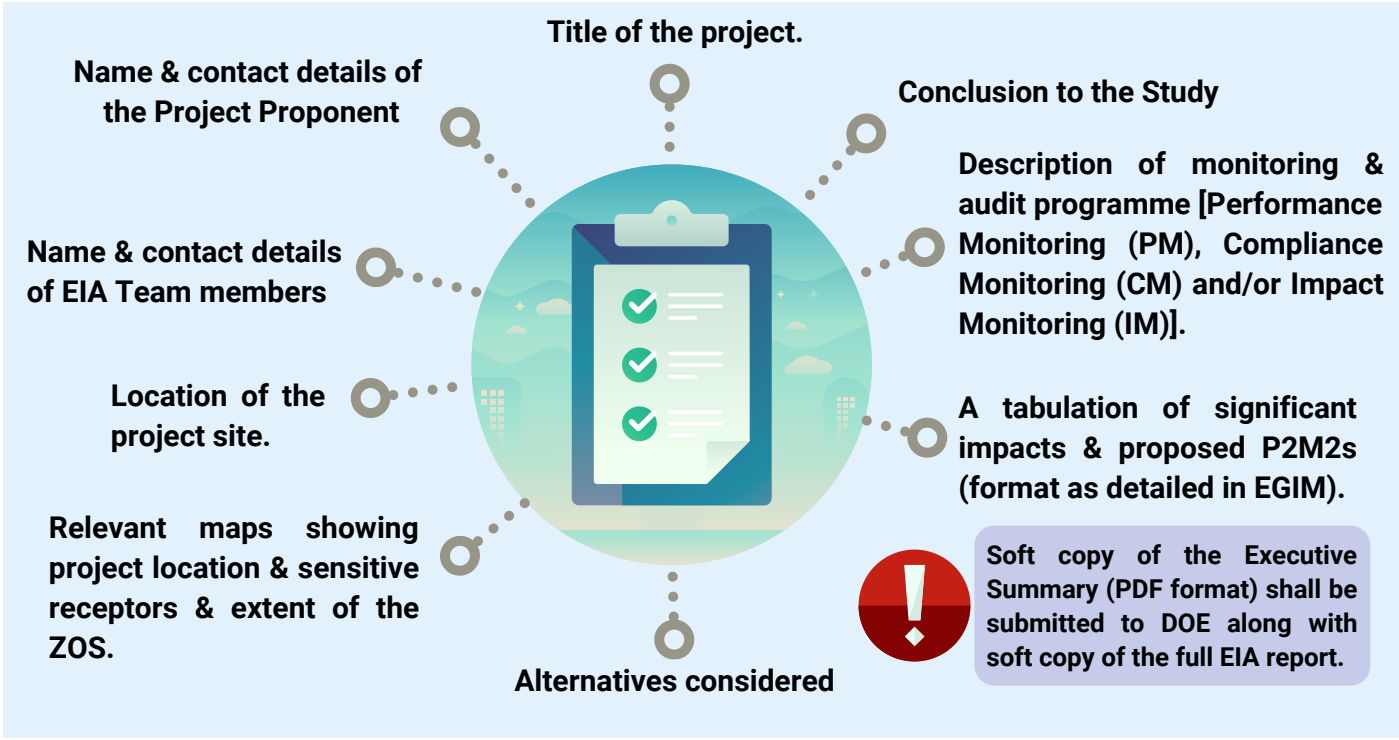
- Water supply.
- Electricity.
- Sewerage.
- Telecommunications.
- Transport system.
- Waste management.

6 Project Implementation Schedule

- The estimated timeline for various stages of project implementation from planning, to construction and operational stages.
- Details of each stages of implementation.

EXECUTIVE SUMMARY

The Executive Summary provides a concise brief of the findings & recommendations from the EIA for decision makers to review. The Executive Summary shall be short and written in non-technical language, both in Bahasa Malaysia and English, presenting the following information:



DATA DELIVERABLES

- The Project Proponent shall make available all relevant data collected during the EIA study to be submitted (raw and processed format) along with the EIA report.
- Examples of such data includes – sampling results (certificates and raw data), modelling databases, baseline data (surveys, hydrographic data and climate data), metadata files, etc.
- This data shall be provided to the relevant government agencies upon request.

STAKEHOLDER ENGAGEMENT AND PUBLIC DISPLAY

Public briefing

For EIAs, public engagement is mandatory. It can take many forms but the common one is through a public briefing with the stakeholders within the Zone of Impact (ZOI). In the briefing, the Project Proponent and EIA Team shall present the project brief followed by a questions and answers (Q&A) session. All discussions will be recorded and reported in the EIA.

Public display and review of EIA report

For Schedule 2 EIAs, there is a one month review period whereby the public will officially be requested to submit their responses and comments in writing to the DOE. Notification of the public display is published online in two local newspapers consecutively for three (3) days.

Display locations

The EIA will be displayed at selected locations (DOE office, public libraries and local authority offices) where the public can view the documents easily. The Project Proponent and Qualified Person can hold discussions with DOE to propose suitable locations for display.

Online display

For the Second Schedule activities, the Ringkasan Eksekutif and Executive Summary in infographic format will need to be uploaded on DOE website for the duration of the review period.

The full EIA report can be uploaded for comments on Project Proponent/ EIA consultants website.

Additional engagements

While it is only mandatory for the EIA for official public engagement, all comments are useful in the EIA study. The Project Proponent is encouraged to carry out stakeholder engagements voluntarily even for First Schedule EIAs.

Documentation

The public participation process shall be properly documented and reported in the EIA.

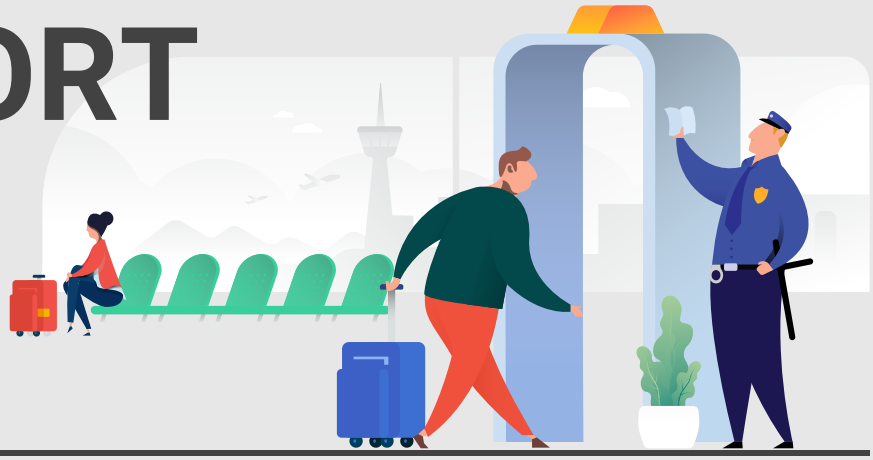
The report shall contain the following:

- Details of the programme (dates, venue, itinerary).
- Attendance list of participants.
- Copies of survey forms.
- Brief summary of findings from the event e.g. reports, minutes of meeting, list of questions and responses, photograph of event.
- Video or voice recordings (optional and only as reference).

The report shall form part of the appendix in the EIA, and the issues brought up and responses from the Project Proponent, must be clearly stated and discussed in the EIA report.

EIA REPORT

SUBMISSION & REVIEW PROCESS

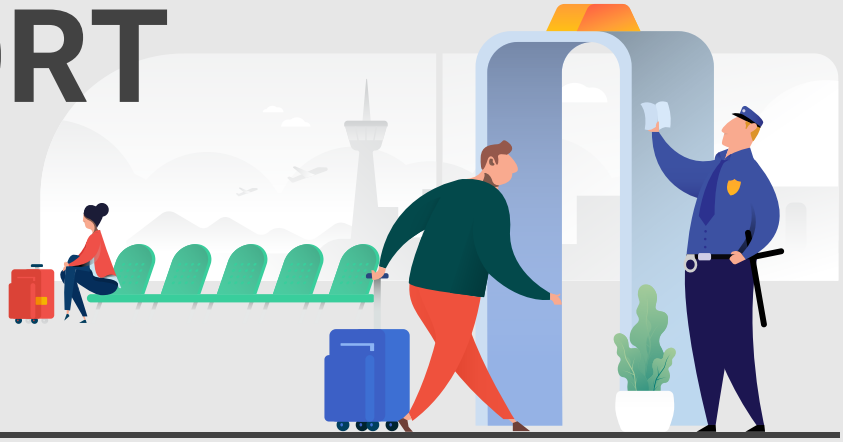


Components	First Schedule Activities
Report Submission	Submission to DOE State Office
No. of Reports	3 hard copies + 1 soft-copy (CD) to State DOE + 1 soft-copy (CD) to State DOE + 1 distribution by soft-copy (CD) to agency/AI/NGOs for comment
No. of Revised EIA (if needed)	3 hard copies + 1 soft-copy (CD)
Review Timeline	25 working days (5 weeks)
Public Participation	✓
Public Display	✗
Web Display	Not required. Submit soft-copy (CD) of the EIA Report to DOE State Office
Advertisement	✗

Source: Adapted from EGIM, DOE, 2016.

EIA REPORT

SUBMISSION & REVIEW PROCESS



Components	Second Schedule Activities
Report Submission	Submission to DOE HQ
No. of Reports	**3** hard copies + **1** soft-copy (CD) to DOE HQ + **1** hard-copy to relevant State DOEs + **1** distribution by soft-copy (CD) to agency/AI/NGOs for comment
No. of Revised EIA (if needed)	**3** hard copies + **1** soft-copy (CD)
Review Timeline	**60** working days (12 weeks)
Public Participation	✓
Public Display	✓
Web Display	Required. Submit soft-copy (CD) of the EIA Report to DOE HQ
Advertisement	Advertised online in 2 major newspaper outlets for 3 consecutive days

Source: Adapted from EGIM, DOE, 2016.

EIA REPORT EVALUATION CRITERIA

As stated in the following sections of the EQA 1974 :-

SECTION 34A (2c)

The report shall be in in accordance with the guidelines as the Director General may prescribe and shall contain-

(a) an assessment of the impact such activity will have or is likely to have on the environment; and

(b) the proposed measures that shall be undertaken to prevent, reduce or control the adverse impact on the environment.

SECTION 34A (4)

If the Director general, on examining the report and after making such inquiries as he considers necessary, is of the opinion that—

(a) the report is not in accordance with the development plan or physical plan approved by the relevant approving authority; or

(b) the report does not satisfy the requirements under subsection (2c),

he shall not approve the report, giving reasons for not approving, and shall inform the person and the relevant approving authority accordingly.

SECTION 34A (3)

If the Director General on examining the report and after making such inquiries as he considers necessary, is of the opinion that the report satisfies the requirements of subsection (2c) and that the measures to be undertaken to prevent, reduce or control the adverse impact on the environment are adequate, he shall approve the report, with or without conditions attached thereto, and shall inform the person intending to carry out the prescribed activity and the relevant approving authorities accordingly.

SECTION 34A (5)

The Director General may require the person to submit any other report to him, in addition to the report required to be submitted under subsection 34A(2), relating to the environmental impact for his approval.

Thus, The EIA report submission shall be in line with the steps and procedures outlined in the EGIM (DOE, 2016). An EIA Checklist can be used to assist in conducting self-check of the quality of the EIA prior to submission to the EIA. An EIA checklist is appended in Appendix E, which is required to be filled in by the Qualified Person and included in the EIA report. During the reviewing process, the possible outcomes of the EIATRC meetings are:

1. **Approval of the EIA Report, provided that the report meets with the requirements of Section 34A (3) of the Environmental Quality Act (EQA) 1974.**

2. **Shall not approve the EIA Report, where the report does not meet the requirements of Section 34A (3) of the EQA 1974**

If the EIA is approved, **Conditions of Approval (COA)** will be issued by the DOE to the Project Proponent.

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GLOSSARY

Analysis	An examination in order to understand.
Anchorage	An area off the coast which is suitable for a ship to anchor.
Appointed Individuals (AIs)	Persons appointed to be part of the TRC with expertise and specialist knowledge on specific fields/subjects to contribute to the technical review of a report.
Approving Authority/Agencies	Any government ministry, agencies or department with the authority to approved a project and/or activity under their jurisdiction by law.
Aquatic	Pertaining the ecosystem influenced by water and all its plants and animal that live within or nearby which has adapted to life in such environment.
Assessment	Examination in order to decide.
Auditing	Evaluation process carried out by an independent auditor to determine effectiveness and performance of P2M2 and to ensure compliance of a project with Condition Of Approval (COA).
Backshore	That zone of the shore or beach lying between the foreshore and the coastline comprising the berm or berms and acted upon by waves only during severe storms, especially when combined with exceptionally high water.
Bank	• The rising ground bordering a lake, river, or sea; or of a river or channel, for which it is designated as right or left as the observer is facing downstream. • An elevation of the sea floor or larger area, located on a continental (or island) shoals.
Baseline Data	Site specific data pertaining to the existing environment (physical, chemical, biological and human). It establishes the ambient situation, usually before some drastic change occurs, e.g. a major project.
Baseline Studies	Baseline studies are fundamental surveys of the physico-chemical, biological, and human environment. They may be specific to a particular project or they may have to be provide a data-base for future Environmental Assessment or Environmental Impact Assessment at other localities.
Basin	A depressed area with no surface outlet, such as a lake basin or an enclosed sea.
Bathymetry	The measurement of water depths in oceans, seas, and lakes; also information derived from such measurement.
Beach	On a shore, the area on which the wave break and over which shore debris, such as sand, shingle, pebbles accumulate. A beach includes backshore and foreshore.
Bed	The bottom of a watercourse, or any body of water.
Best Available Technology (BAT)	The most current and advanced technologies and methods available for pollution prevention and management.
Best Management Practices (BMPs)	Using the best controlling measures to prevent or mitigate pollution of other sources of environmental impact.
Bill of Quantities (BQ)	Itemised list of construction works and management requirements for a project issued to a contractor or specialist to quote.

Biological Diversity/ Biodiversity	The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.
Breakwater	A structure protecting a shore area, harbour, anchorage, or basin from waves.
Buffer Zone	An area designated around the boundary of a project and/or adjacent to environmentally sensitive areas where no or limited development is allowed for the purpose of mitigating against any environmental impact from the site to the surrounding areas or vice versa.
Carrying Capacity	• Maximum population size if the species that the environment can sustain indefinitely, given the flood, habitat, water, and other necessities available in the environment. • The ability of a built resource or natural resource to absorb population growth and related physical development without degradation.
Catchment	The area determined by landform within which falling rain will contribute to runoff at a particular point such as a stream or river. Often, it is used synonymously with basin or watershed.
Chart Datum	• The plane or level to which soundings (or elevations) or tide heights are referenced (usually Low Water Datum).
Checklist	A list for verification purposes, a comprehensive list; an inventory.
Coastal Protection	Any structural and non-structural works used in the reduction of erosion of the coastline.
Community	Any naturally occurring group of different organisms sharing a particular habitat.
Compliance Monitoring (CM)	Monitoring of P2M2 installed within the project site to ensure they are functional and effective in treating pollutants.
Conditions of Approval (COA)	A set of legally binding instructions and requirements prepared by DOE after the end of EIA process for the Project Proponent to abide by for all phases of the development.
Coral Reefs	A coral-alga mound or ridge of in-place coral colonies and skeletal fragments, carbonate sand, and organically-secreted calcium carbonate. A coral reed is built up around wave-resistant framework, usually of older coral colonies.
Cumulative Impact	The total sum from combination of various activities or sources resulting in accumulation and aggregation of multiple impacts which would be significantly expanded as compared to a single event.
Cut and Fill	Procedure in which the elevation of a landform surface is modified by the removal or addition of surface material.
Data	A general term used to denote any kind or all facts in the form of numbers, letters, text or symbols. (Raw facts or statistics which alone have little or no meaning, but as a group allow some meaningful relationships to be drawn).
Development Order (DO)	A legal approval for a Project Proponent to proceed with the construction of a project once they have satisfied the requirements of the approving authority, i.e. One Stop Centre (OSC).

Disposal Area	A designated or gazette area specifically for the storage of waste or excess materials generated from construction.
Drainage	Natural or artificial removal of surface and sub-surface water from an area.
Earthworks	• Excavation and relocation of large quantities of soil and earth to form slopes, platforms, embankments, etc.
Ecology	The study of the habits and modes of life-living organisms (such as plants and animals), and their relationships to each other and their environment.
Ecosystem	A dynamic complex of plant, animal and microorganism communities and their non-living environment that interact as a function unit.
Emergency Response Plan (ERP)	A manual incorporating all measures, actions, roles and responsibilities for the project team to take action during emergencies and crisis, covers various scenarios that may occur during construction and operations.
Environment	The surrounding zone (the specific zone to be affected by the project), all natural resources (physical and biological and human resources people, economic development and quality of life values).
Environment Impact Assessment (EIA)	A study to identify, predict, evaluate and communicate information about the impacts (both beneficial and adverse) on the environment of a proposed development activity and to detail out the mitigating measures prior to project approval and implementation.
Environmental Management Plan (EMP)	A legally binding document which spells out in concise details the environmental requirements and P2M2 as detailed in the EIA and LD-P2M2 as well as other information, e.g. environmental budget, monitoring and audit programmes and roles and responsibilities of the Environmental Management Team (EMT).
Environmental Management Team (EMT)	Special team comprising of relevant personnel of a project with specific roles and responsibilities in the management of environmental matters at-site.
Environmental Manager (EM)	A person mandated to oversee all aspects of managing environmental compliance for a project, usually heads the EMT.
Environmental Monitoring	Observation of effects of development projects on environmental resources and values, including sampling, analysis, temporary monitoring during project construction stage and continuing periodic monitoring following commencement of project operations. Environmental monitoring allows the actual impacts of the project to be measured and improves the data-base for future impact prediction.
Environmental Officer	The site personnel directly in charge of supervising a site to ensure that all P2M2 are in place, maintained and repaired and that all requirements within the COA are adhered by the contractors. Other task includes training of staff, taking samples for reporting and attending site walkabouts and meetings.
Environmental Performance Monitoring Committee (EPMC)	Organisational setup within the Project Proponent which shall manage environmental compliance at the working group level during construction and operation phases of a project.

Environmental Pledge/Declaration	Statement by the Project Proponent and/or Qualified Person preparing the EIA that they have carried out the study in the proper manner and all facts and figures are to their knowledge true and correct and that they will carry out the recommendations and P2M2 for the project as described in the EIA.
Environmental Regulatory Compliance Monitoring Committee (ERCMC)	Organisational setup within the Project Proponent which shall management environmental compliance at the policy level during construction and operational phase of a project.
Environmental Scoping Information (ESI)	A report detailing the findings of the environmental scoping carried out for a site to allow for decision making through identification of significant impacts, proposals for mitigation measures and required studies.
Environmental Scoping Matrix	Technique to integrated large amounts of information for a rapid assessment in identifying significant impacts based on project activities and their impacts on different aspects of the environment.
Environmentally Sensitive Areas (ESA)	Areas of critical importance which has characteristics of significant biodiversity value; natural heritage; scenic beauty; provision of important ecosystem services; and/or is easily degraded due to natural and anthropogenic impacts, warranting its protection and conservation.
Erosion	The detachment or wearing away of the earth's surface, particularly soil or loose materials, by flowing water, wind or other geological agents.
Erosion and Sediment Control Plan (ESCP)	Document incorporating all erosion and sediment control measures as required by the Department of Irrigation and Drainage (DID) for a site. Usually prepared by a professional engineer (PE) to be endorsed by DID.
Eutrophication	The natural process of nutrient enrichment of water body which is enhanced by phosphate and nitrate waste from human activity. It can cause excessive organic growth and depletion of oxygen concentrations, resulting in death of aquatic animals and higher plants.
Geological Terrain Mapping (GTM)	Report prepared by a licensed Geologist required by the Minerals and Geoscience Department (JMG) to be submitted for DO approval, contains information on the terrain, geological makeup, soils and slope classification to allow for assessment of site suitability for construction.
Geology	The science which has for its object the investigation of the earth's crust, of the strata which enter into its composition with their mutual relations, and of the successive changes to which their present condition and position are due.
Government Agencies (GAs)	Personnel from government ministries, agencies and/or department with a role in specific committees, approving authorities or decision making bodies.
Self-Regulation (SR)	An initiative by DOE to cultivate environmental ownership and excellence in environmental commitment from the sectors regulated by DOE especially in regards to performance monitoring of pollution control measures, scheduled reporting, record keeping, qualified persons and involvement of environmental professionals with specific roles.
Habitat	The normal abode or locality of an animal or plant; the physical environment of a community; the place where a person or thing can usually be found.

Health Impact Assessment (HIA)	A report which assesses the health impacts of policies, plans and projects using qualitative, quantitative and participatory techniques for decision making. Usually required by the Ministry of Health (MOH) or Department of Health (DOH) for projects with health implications to nearby populations.
Hydraulic Report	A detailed technical report used in the assessment of impacts from a project/activity on the coastal and marine environment based on various scenarios and site conditions.
Hydrology	The study of the rainfall and runoff process and related to the derivation of hydrographs for given floods, droughts and seasonal pattern of inundation.
Impact Monitoring (IM)	Monitoring of impacts outside of the project site to ascertain its origin and magnitude.
Land Acquisition/ Alienation	The act of obtaining, either voluntarily or by law, the necessary land form existing landowners. May involve relocation of existing population on the said piece of land.
Land Disturbing Pollution Prevention and Mitigation Measures (LD-P2M2)	Document incorporating construction methods, processes, materials and practices intended to prevent, reduce or eliminate the generation of pollutants at the source (development area) during any land-disturbing activity through the protection of natural resources through incorporation of BMPs.
Land-Disturbing Activities	Activities such as clearing of trees or vegetation, excavating, raising or sloping of ground, trenching, grading and blasting.
Mangroves	One of several genera of tropical trees or shrubs which produce many prop roots and grow along low-lying coasts into shallow water.
Marine Risk Assessment (MRA)	Technical document which studies the existing marine traffic of the area of proposed project, identifying constraints for navigation and risk of potential collision or mishaps during vessel operations.
Method Statement	A detailed scope and account of proposed construction techniques, equipment and machinery usage and structural and non-structural measures applied in carrying out construction, usually prepared by the Contractors.
Mitigation and Abatement Measures	These are measures adopted into the final project plan which either moderate or completely forestall potential environmental impact.
Modelling	To simulate a particular feature of the world using mathematical and computer aids to better understand, define, quantify and visualise the process.
Monitoring	To measure, systematically and repeatedly, the continuing conditions to tract change(s).
Noise	A sound, especially one that is loud or unpleasant or that causes disturbance.
Oil spill	Release of a liquid petroleum hydrocarbon into the environment, especially marine areas, due to human activity and is a form of pollution.
Outfall	The place where a river, drain, or sewer empties into the sea, a river or a lake.
Performance Monitoring (PM)	Monitoring of performance system.
Pile	A long, heavy timber or section of concrete or metal that is driven or jetted into the earth or seabed to serve as a support or protection.
Piling	A group of piles

Pollution Prevention and Mitigation Measures (P2M2)	The various methods (structural and non-structural) required to ensure that pollution does not occur or at least minimised as a result of a project.
Prescribed Activity	Any activity specified by the Director General of Environment under the Environmental Quality (Prescribed Activity) (Environmental Impact Assessment) Order 2015, as requiring to undergo an EIA.
Project Activities	Specified tasks undertaken throughout the course of a project (earthworks, construction or operational) which serves to meet certain objectives.
Project Brief	Information pertaining to a project or development, including the details of the project, layout, method statement, location, etc. which can assist in assessment of the project.
Project Proponent	The main person, organisation or body which is proposing to undertake a project or activity.
Public Display	Mandatory viewing of Second Schedule EIA for fixed period of time whereby the public can forward recommendations and objections to the report for consideration by DOE in the EIA approval process.
Public Participation/ Engagement	The process whereby the public and related stakeholders are allowed the opportunity to participate in the planning, decision making, objection, idea sharing and/or approval of a project which may affect them. Can be mandated or voluntary.
Qualified Person	A person appointed by the Director General of Environment or is certified by/registered with DOE under Section 34A (2B) to carry out an EIA study.
Recreation	Activity of leisure, leisure being discretionary time.
Residual Impacts	Impacts that still persist despite P2M2 and BMPs put in place.
Revised TOR	Final version of the TOR after incorporation of comments from the TRC and additional information.
Risk	A combination of the likelihood of an occurrence of a hazardous event with specified period or in specified circumstances.
Runoff	The portion of precipitation that runs off the surface as opposed to soaking in.
Sampling Station	Location identified and designated for collection of environmental data (air, water, noise, vibration, ecology, etc.).
Schedule	Categorisation of Prescribed Activities divided into the First Schedule (EIA without need for public display and will be processed by DOE State) and Second Schedule (EIA requiring public display and will be processed by DOE HQ).
Scheduled Wastes	Any form of toxic and hazardous wastes listed under the First Schedule of the Environmental Quality (Schedule Wastes) Regulations 2005 (Amendment 2007).
Scoping	Initial phase in an EIA to identify the key environmental issues and the study spatial and temporal boundaries.
Screening	Process by which a proposed development project is identified as being subjected to a regulatory provision requiring an EIA.
Sedimentation	The deposition of sediment from suspension in water.

Self-regulation	The adoption and implementation of measures and practices by a Project Proponent on their own initiative without requiring intervention of the authorities to safeguard the environment and meet all regulatory requirements of the country.
Setback	Distance which a building or other structure is set back from a street or road, a river, a shore or any other place which is deemed to need protection.
Sewage	• Any liquid waste or wastewater discharge containing human, animal, domestic or putrescible matter in suspension or solution, and includes liquids containing chemicals in solution either in the raw, treated or partially treated form. • Any liquid discharges containing human excreta, animal or vegetable matters in suspension or solution derived from domestic activities and being generated from household, commercial, institutional and industrial premises including liquid discharges from water closets, basins, sinks, bathrooms and other sanitary appliances but excluding rain water and prohibited effluent.
Sewage Treatment System (STS)/Plant (STP)	Any facility designed and constructed for the purpose of reducing potential of the sewage to cause pollution.
Siltation	The deposition or accumulation of silt that is suspended in a body of water.
Site Suitability Assessment (SSA)	A study on the suitability of various sites and the determination based on specific criteria on the best possible site for a project.
Social Impact Assessment (SIA)	A process to identify, predict, evaluate and communicate information about the social impacts of a proposed project, policy, programme or plan on a community and their activities, and to choose the best development option and subsequently propose mitigation measures.
Soil Investigation (SI)	Technical study on the soil and sub-surface strata of a project site to determine the sub-surface conditions and engineering requirements needed prior to a development
Spoil	Rock and debris produced by tunnelling, dredging and other excavations.
Statement of Need	A brief on the justifications for a project, including supporting arguments and evidence on the necessity of the project and benefits that will be generated.
Stormwater	Water that originates during precipitation events, e.g. rainfall.
Sullage	Wastewater that arise from domestic activities such as washing in bathrooms and kitchen, including water from food preparation and dishwashing, which does not contain human excreta.
Suspended Sediment	Sediment suspended in a fluid by its (fluid) turbulent flow.
Technical Review Committee (TRC)	A panel of decision makers comprising DOE officer, AIs and GAs that are selected to review the TOR and/or EIA to provide approval based on the reports submitted by the Project Proponent and Qualified Person(s).

Terms of Reference (TOR)	Product from scoping process which sets the objectives, defines the scope, and establishes the strategy and schedule for EIA process to address identified significant issues.
Terrain	Pertaining to the physical features of a land or area.
Tide	The periodic rising and falling of the water that result from gravitational attraction of the moon and sun and other astronomical bodies acting upon the rotating earth.
Topography	The configuration of the surface of the earth, including its relief, the position of its streams, roads, cities, etc. The earth's natural and physical features collectively.
TOR Adequacy Check (TORAC)	A review by a selected panel of DOE officers, AIs and/or GAs on whether a TOR has been prepared in accordance with DOE requirements and contains all necessary information for decision making to be made.
Traffic Impact Assessment (TIA)	A study/report on the condition of the roads and traffic in an area and if there is adequate capacity to meet the increasing demand from a project or to identify measures required to ensure that traffic will be smooth and uninterrupted.
Vessels	Any crafts travelling on water.
Visual/Aesthetics	Pleasing scenery, vistas and view to and view to an audience.
Wastes	Any substance which is discarded after primary us. Comprises of various types of wastes, such as municipal wastes, scheduled wastes, biomass wastes, etc.
Water quality	A term to describe the chemical, physical and biological characteristics of water.
Water Quality Index (WQI)	An index integrating six water quality parameters to provide a general categorisation to determine the condition of the water source.
Zone of Impact (ZOI)	The maximum area which will receive the impacts from the project.
Zone of Study (ZOS)	Boundary identified for the EIA Study which would be the main spatial area to carry out baseline fata gathering, determine extent of modelling and assessment and other supporting studies.

APPENDIX A

APPENDIX A

RIVER WATER QUALITY

National Water Quality Standards (NWQS) for Malaysia

Parameter	Unit	Class					
		I	IIA	IIB	III	IV	V
AN	mg/L	0.1	0.3	0.3	0.9	2.7	>2.7
BOD	mg/L	1	3	3	6	12	>12
COD	mg/L	10	25	25	50	100	>100
DO	mg/L	7	5 – 7	5 – 7	3 – 5	<3	<1
pH	-	6. 5 – 8.5	6 – 9	6 – 9	5 – 9	5 – 9	-
Colour	TCU	15	150	150	-	-	-
Electric Conductivity*	µS/cm	1,000	1,000	-	-	6,000	-
Floatables	-	N	N	N	-	-	-
Odour	-	N	N	N	-	-	-
Salinity	%	0.5	1	-	-	2	-
Taste	-	N	N	N	-	-	-
Total Dissolved Solids	mg/L	500	1,000	-	-	4,00	-
TSS	mg/L	25	50	50	150	300	300
Temperature	˚C	-	Normal + 2˚C	-	Normal + 2˚C	-	-
Turbidity	NTU	5	50	50	-	-	-
Faecal Coliform**	count/100 mL	10	100	400	5,000 (20,000)a	5,000 (20,000)a	-
Total Coliform	count/100 mL	100	5,000	5,000	50,000	50,000	>50,000

Source: Malaysia Environmental Quality Report (EQR) 2015, DOQ, 2015.

Notes: N = No visible floatable materials or debris, no objectionable odour or no objectionable taste.

* = Related parameters, only one recommended for use.

** = Geometric mean.

a = Maximum not to be exceeded.

National Water Quality Standards (NWQS) for Malaysia (Continued)

Parameter	Unit	Class				
		I	IIA/IIB	III	IV	V
Aluminium, Al	mg/L	NATURAL LEVELS OF ABSENT	-	(0.06)	0.5	LEVELS ABOVE IV
Arsenic, Ar	mg/L		0.05	0.4 (0.05)	0.1	
Barium, Ba	mg/L		1	-	-	
Cadmium, Cd	mg/L		0.01	0.01* (0.01)	0.01	
Chromium, Cr(IV)	mg/L		0.05	1.4 (0.05)	0.1	
Chromium, Cr(III)	mg/L		-	2.5	-	
Copper, Cu	mg/L		0.02	-	0.2	
Hardness	mg/L		250	-	-	
Calcium, Ca	mg/L		-	-	-	
Magnesium, Mg	mg/L		-	-	-	
Sodium, Na	mg/L		-	-	3 SAR	
Potassium, K	mg/L		-	-	-	
Iron, Fe	mg/L		1	1	1 (Leaf) 5 (Others)	
Lead, Pb			0.05	0.02* (0.01)	5	
Manganese, Mn	mg/L		0.1	0.1	0.2	
Mercury, Hg	mg/L		0.001	0.004 (0.0001)	0.002	
Nickel, Ni	mg/L		0.05	0.9*	0.2	
Selenium, Se	mg/L		0.01	0.25 (0.04)	0.02	
Silver, Ag	mg/L		0.05	0.0002	-	
Stanium, Sn	mg/L		-	0.004	-	
Uranium, U	mg/L		-	-	-	
Zinc, Zn	mg/L		5	0.4*	2	
Boron, B	mg/L		1	(3.4)	0.8	
Chlorine, Cl	mg/L		200	-	80	
Chlorine, Cl_2	mg/L		-	(0.02)	-	
Cyanide, CN	mg/L		0.02	0.06 (0.02)	-	
Flouride, F	mg/L		1.5	10	1	

Source: Malaysia EQR 2015, DOE, 2015.

Notes: * = At hardness 50 mg/L $CaCO_3$

= Maximum (unbracketed) and 24-hour average (bracketed) concentrations.

N = Free from visible film sheen, discolouration and deposits.

National Water Quality Standards (NWQS) for Malaysia (Continued)

Parameter	Unit	Class				
		I	IIA/IIB	III	IV	V
Nitrite, NO_2	mg/L	NATURAL LEVELS OR ABSENT	0.4	0.4 (0.03)	-	LEVELS ABOVE IV
Nitrate, NO_3	mg/L		7	-	5	
Phosphorus, P	mg/L		0.2	0.1	-	
Silica	mg/L		50	-	-	
Sulphide, SO_4	mg/L		250	-	-	
Sulfur, S	mg/L		0.05	(0.001)	-	
Carbon dioxide, CO_2	mg/L		-	-	-	
Gross – alfa	Bq/L		0.1	-	-	
Gross – beta	Bq/L		1	-	-	
Ra –226	Bq/L		<0.1	-	-	
Sr – 90	Bq/L		<1	-	-	
CCE	µg/L		500	-	-	
MBAS/BAS	µg/L		500	5,000 (200)	-	
O&G (Mineral)	µg/L		40; N	N	-	
O&G (Emulsified edible)	µg/L		7,000; N	N	-	
PCB	µg/L		0.1	6 (0.05)	-	
Phenol	µg/L		10	-	-	
Aldrin/Dieldrin	µg/L		0.02	0.2 (0.01)	-	
BHC	µg/L		2	9 (0.1)	-	
Chlordane	µg/L		0.08	2 (0.02)	-	
t – DDT	µg/L		0.1	(1)	-	
Endosulfan	µg/L		10	-	-	
Heptachlor/ Epoxide	µg/L		0.05	0.9 (0.06)	-	
Lindane	µg/L		2	3 (0.4)	-	
2,4 – D	µg/L		70	450	-	
2,4,5 – T	µg/L		10	160	-	
2,4,5 – TP	µg/L		4	850	-	
Paraquat	µg/L		10	1,800	-	

Source: Malaysia EQR 2015, DOE, 2015.

Notes: * = At hardness 50 mg/L $CaCO_3$

= Maximum (unbracketed) and 24-hour average (bracketed) concentrations.

N = Free from visible film sheen, discolouration and deposits.

DOE Water Quality Classification by WQI

Water Quality Index	Index Range		
	Clean	Slightly Polluted	Polluted
WQI	81 – 100	60 – 80	0 – 59

DOE WQI Classification

Parameter	Unit	Class				
		I	II	III	IV	V
AN	mg/L	<0.1	0.1 – 0.3	0.3 – 0.9	0.9 – 2.7	>2.7
BOD	mg/L	<1	1 – 3	3 – 6	6 – 12	>12
COD	mg/L	<10	10 – 25	25 – 50	50 – 100	>100
DO	mg/L	>7	5 – 7	3 – 5	1 – 3	<1
pH	-	>7.0	6.0 – 7.0	5.0 – 6.0	<5	>5.0
TSS	mg/L	<25	25 – 50	50 – 150	150 – 300	>300
WQI		**>92.7**	**76.5 – 92.7**	**51.9 – 76.5**	**31.0 – 51.9**	**<31.0**

Source: Malaysia EQR 2015, DOE, 2015.

GROUNDWATER QUALITY

National Groundwater Quality Standards For Conventional Drinking Water Treatment

PARAMETER	THRESHOLD (mg/L)
Total coliform	5000 MPN/100 ml
E.coli	5000 MPN/100 ml
Turbidity	1000 NTU
Color	300 TCU
pH	5.5 – 9.0
Temperature	Normal ± 2˚C
Conductivity	1000 µS/cm[#]
Total dissolved solids	1500
Chloride	250
Ammonia	1.5
Nitrate	10
Iron	1.0
Fluoride	1.5
Hardness	500
Manganese	0.2
COD	10
MBAS	1.0
BOD	6
Nitrite	0.4[#]
Mercury	0.001
Cadmium	0.003
Arsenic	0.01
Cyanide	0.07
Lead	0.05
Chromium	0.05
Copper	1.0
Zinc	3.0
Sodium	200
Sulphate	250
Selenium	0.01
Silver	0.05
Magnesium	150
Mineral oil	0.3
Pesticides*	0.00003-0.03
Phenol	0.002
Nickel	0.002
Gross alpha	0.1 Bq/l
Gross beta	1.0 Bq/l

* Aldrin/dieldrin, DDT, Heptachlor, Methoxychlor, Lindane, Chlordane, Endosulfan, hexachlorobenzane, 2,4,5 – T, 2,4 – D, 2,4 – DB, Alachlor, Aldicarb, Carbofuran, MCPA, Permethrin

[#] Diambil dari *Class IIA, National Water Quality Standards*

Source: Standard kualiti air tanah kebangsaan (2019).

MARINE WATER QUALITY

Marine Water Quality Criteria and Standards for Malaysia (MWQCS)

Parameter	Unit	Class 1	Class 2	Class 3	Class E
		Preservation, Marine Protected Areas, Marine Parks	**Marine life, Fisheries, Coral reefs, Recreational and Mariculture**	**Ports, Oil and Gas Fields**	**Mangroves, Estuarine and Rivermouth Water**
Temperature	°C	≤ 2°C increase over maximum ambient	≤ 2°C increase over maximum ambient	≤ 2°C increase over maximum ambient	≤ 2°C increase over maximum ambient
Dissolved Oxygen	mg/L	>80% saturation	5	3	4
Total Suspended Solids	mg/L	25 mg/L or ≤ 10% increase in seasonal average, whichever is lower	50 mg/L (25 mg/L) or ≤ 10% increase in seasonal average, whichever is lower	100 mg/L or ≤ 10% increase in seasonal average, whichever is lower	100mg/L or ≤ 30% increase in seasonal average, whichever is lower
Oil and Grease	mg/L	0.01	0.14	5.0	0.14
Mercury*	µg/L	0.04	0.16 (0.04)	50	0.5
Cadmium	µg/L	0.5	2 (3)	10	2
Chromium (VI)	µg/L	5	10	48	10
Copper	µg/L	1.3	2.9	10	2.9
Arsenic (III)*	µg/L	3	20 (3)	50	20 (3)
Lead	µg/L	4.4	8.5	50	8.5
Zinc	µg/L	15	50	100	50
Cyanide	µg/L	2	7	20	7
Ammonia (unionised)	µg/L	35	70	320	70
Nitrite (NO_2)	µg/L	10	55	1,000	55
Nitrate (NO_3)	µg/L	10	60	1,000	60
Phosphate	µg/L	5	75	670	75
Phenol	µg/L	1	10	100	10

Parameter	Unit	Class 1	Class 2	Class 3	Class E
		Preservation, Marine Protected Areas, Marine Parks	Marine life, Fisheries, Coral reefs, Recreational and Mariculture	Ports, Oil and Gas Fields	Mangroves, Estuarine and Rivermouth Water
Tributylyin (TBT)	µg/L	0.001	0.01	0.05	0.01
Faecal coliform	-	70 faecal coliform count/100 mL	100 faecal coliform count/100 mL & (70 faecal coliform count/100 mL)	200 faecal coliform count/100 mL	100 faecal coliform count/100 mL & (70 faecal coliform count/100 mL)
Polycyclic Aromatic Hydrocarbons (PAHs)	µg/L	100	200	1,000	1,000

Source: Malaysia EQR 2015, DOE, 2015

Note: * MWQCS in parentheses are for coastal and marine water areas where seafood for human consumption is applicable.

Marine Water Quality Index Classification

Marine Water Quality Index	Index Range			
	Excellent	Good	Moderate	Poor
MWQI	90 – 100	80 – <90	50 – <80	0 – <50

Source: Malaysia EQR 2015, DOE, 2015

SEWAGE DISCHARGE STANDARDS

Acceptable Conditions of Sewage Discharge of Standards A and B of the Second Schedule (Regulation 7),

Environmental Quality (Sewage) Regulations, 2009

Parameters	Unit	Standard A	Standard B
Temperature	°C	40	40
pH	–	6.0 – 9.0	5.5 – 9.0
Biochemical Oxygen Demand (BOD_5) at 20°C	mg/L	20	50
Chemical Oxygen Demand	mg/L	120	200
Suspended Solids	mg/L	50	100
Oil and Grease	mg/L	5.0	10.0
Ammoniacal Nitrogen (enclosed water body)	mg/L	5.0	5.0
Ammoniacal Nitrogen (river)	mg/L	10.0	20.0
Nitrate Nitrogen (river)	mg/L	20.0	50.0
Nitrate Nitrogen (enclosed water body)	mg/L	10.0	10.0
Phosphorus (enclosed water body)	mg/L	5.0	10.0

Source: Environmental Quality (Sewage) Regulations 2009.

Existing Sewage Treatment System (Approved before January 1999)

Parameter	Unit	Communal Septic Tank		Imhoff Tank		Aerated Lagoon		Oxidation Pond		Mechanical System	
		Standard		Standard		Standard		Standard		Standard	
		A	B	A	B	A	B	A	B	A	B
(a) BOD_5 at 20° C	mg/L	200	200	175	175	100	100	120	120	60	60
(b) COD	mg/L	-	-	-	-	300	300	360	360	180	240
(c) Suspended Solids	mg/L	180	180	150	150	120	120	150	150	100	120
(d) Oil and Grease	mg/L	-	-	-	-	-	-	-	-	20	20
(e) Ammoniacal Nitrogen	mg/L	-	-	100	100	80	80	70	70	60	60

Source: Environmental Quality (Sewage) Regulations 2009.

Existing Sewage Treatment System (Approved after January 1999)

Parameter	Unit	Standard	
		A	B
(a) BOD_5 at 20° C	mg/L	20	50
(b) COD	mg/L	120	200
(c) Suspended Solids	mg/L	50	100
(d) Oil and Grease	mg/L	20	20
(e) Ammoniacal Nitrogen	mg/L	50	50

Source: Environmental Quality (Sewage) Regulations 2009.

APPENDIX B

APPENDIX B
AIR QUALITY
Malaysian Ambient Air Quality Standards (MAAQS)

Pollutant	Unit	Averaging Time	Standard (2020)
PM_{10}	$\mu g/m^3$	1 year 24 hours	40 100
$PM_{2.5}$	$\mu g/m^3$	1 year 24 hours	15 35
SO_2	$\mu g/m^3$	1 hour 24 hours	250 80
CO	mg/m^3	1 hour 8 hours	30 10
NO_2	$\mu g/m^3$	1 hour 24 hours	280 70
O_3	$\mu g/m^3$	1 hour 8 hours	180 100

Source: DOE Notice 1/2015, DOE, 2015.

APPENDIX C

APPENDIX C

SCHEDULE OF PERMISIBLE SOUND LEVELS

FIRST SCHEDULE

RECOMMENDED PERMISSIBLE SOUND LEVEL (L_{Aeq}) BY RECEIVING LAND USE FOR NEW DEVELOPMENT

Receiving Land Use Category	L_{Aeq} Day 7.00 am – 10.00 pm	L_{Aeq} Night 10.00pm – 7.00 am
Low Density Residential, Noise Sensitive Receptors, Institutional (School, Hospital, Worship).	55 dBA	50 dBA
Suburban Residential (Medium Density), Recreational	60 dBA	55 dBA
Urban Residential (High Density), Mixed Development	65 dBA	60 dBA
Commercial Business Zones	65 dBA	60 dBA
Industrial Zones	70 dBA	65 dBA

SECOND SCHEDULE

RECOMMENDED PERMISSIBLE SOUND LEVEL (L_{Aeq}) BY RECEIVING LAND USE FOR EXISTING BUILT UP AREAS

Receiving Land Use Category	L_{Aeq} Day 7.00 am – 10.00 pm	L_{Aeq} Night 10.00pm – 7.00 am
Low Density Residential, Noise Sensitive Receptors, Institutional (School, Hospital, Worship).	60 dBA	55 dBA
Suburban and Urban Residential, Mixed Development	65 dBA	60 dBA
Commercial Business Zones	70 dBA	65 dBA
Industrial Zones	75 dBA	75 dBA

Source: Guidelines for Environmental Noise Limits and Control, 3rd Edition, DOE, 2019.

Note: The above prescribed L_{Aeq} limits are representative noise levels consistent with developed areas without noise disturbance genrally deemed acceptable to majority of receptors occupying in premises at the respective land category.

THIRD SCHEDULE

RECOMMENDED PERMISSIBLE SOUND LEVEL (L_{Aeq}) TO BE MAINTAINED AT THE EXISTING NOISE CLIMATE

Existing Levels	Recommended Permissible Levels*
L_{Aeq}	Existing L_{Aeq}

Notes

1. Existing L_{Aeq} is determined from baseline measurements of the prevailing noise in the absence of the new noise sources(s); typically undertaken just prior to the operations of the new road, railway line or industrial premises operations, or alternatively with the noise source(s) being assessed to be temporarily disabled.
2. Due to uncertainty in measurements, noise levels within ± 1.5 dBA of the Existing L_{Aeq} is acceptable and deemed maintained at the existing noise climate.

FOURTH SCHEDULE

LIMITING SOUND LEVEL (L_{Aeq}) FROM ROAD TRAFFIC (FOR NEW ROADS AND/OR REDEVELOPMENT OF EXISTING ROADS)

Receiving Land Use Category	L_{Aeq} Day 7.00 am – 10.00 pm	L_{Aeq} Night 10.00pm – 7.00 am
Noise Sensitive Areas Low Density Residential Areas	60 dBA	55 dBA
Suburban and Urban Residential (Medium and High Density)	65 dBA	60 dBA
Commercial and Mixed Development	70 dBA	65 dBA
Industrial	75 dBA	70 dBA

Note: In situations where the existing sound levels of receptors are higher than limits prescribed above, or within (less than) 2 dBA of the above prescribed limits, the maximum permissible levels stipulated in Schedule 3 shall apply.

ANNEX A

SCHEDULE OF RECOMMENDED VIBRATION LIMITS

SCHEDULE 1

RECOMMENDED LIMITS FOR DAMAGE RISK IN BUILDINGS FROM STEADY STATE VIBRATION

Damage Description	Vertical Vibration Peak Velocity V_{max} , [mm/s] (0 to Peak) (10 – 100 Hz)
Safe	Less than 3
Caution Level (Damage Not Necessary Inevitable)	3 to 5
Minor Damage	5 to 30
Major Damage	More Than 30

SCHEDULE 2

RECOMMENDED LIMITS FOR DAMAGE RISK IN BUIDLINGS FROM SHORT TERM VIBRATION

Type of Structure	Vibration Velocity v_i [mm/s] at foundation (as defined by the respective rating curves of Figure 1)	Vibration Velocity v_i [mm/s] at plane of floor of uppermost full storey (all frequencies)
Industrial buildings and building of similar design	Curve C	40
Commercial building, dwelling and buildings of similar design and/or use	Curve B	15
Structures that, because of their particular sensitivity to vibration, do not correspond to those listed above, or of great intrinsic value (e.g. residential houses, or buildings that are under preservation order)	Curve A	8

Source: The Planning Guidelines for Vibration Limits and Control in the Environment, 2nd Edition, DOE, 2007.

SCHEDULE 3

RECOMMENDED LIMITS FOR DAMAGE RISK IN BUILDINGS FROM SINGLE EVENT IMPULSIVE EXCITATION *

Type of Structure	**Ground Vibration Peak Particle Velocity V_{max} [mm/s]**	
	At low frequency < 40 Hz	**At high frequency >40 Hz**
Industrial buildings and buildings of similar design	40	50
Commercial building, dwelling and buildings of similar design and/or use	20	50
Structures that, because of their particular sensitivity to vibration, do not correspond to those listed above, or of great intrinsic value (e.g. residential houses, or buildings that are under preservation order)	12	50

**Single event impulsive excitation not exceeding 3 occurrences per day.*

(Adapted from DIN 42150/3, and Swiss Standard for Vibration Damage to Buildings).

SCHEDULE 4

ACCEPTABLE ROAD TRAFFIC INDUCED VIBRATIONS IN BUILDINGS

Type of Building and Foundation	Recommended Vertical Velocity Limit, v_{max} [mm/s]
-Especially sensitive buildings, and buildings of cultural and historical value	1
-Newly built buildings, and/or foundation of a foot plate (spread footings)	2
-Buildings on cohesion piles	3
-Buildings on bearing piles or friction piles	5

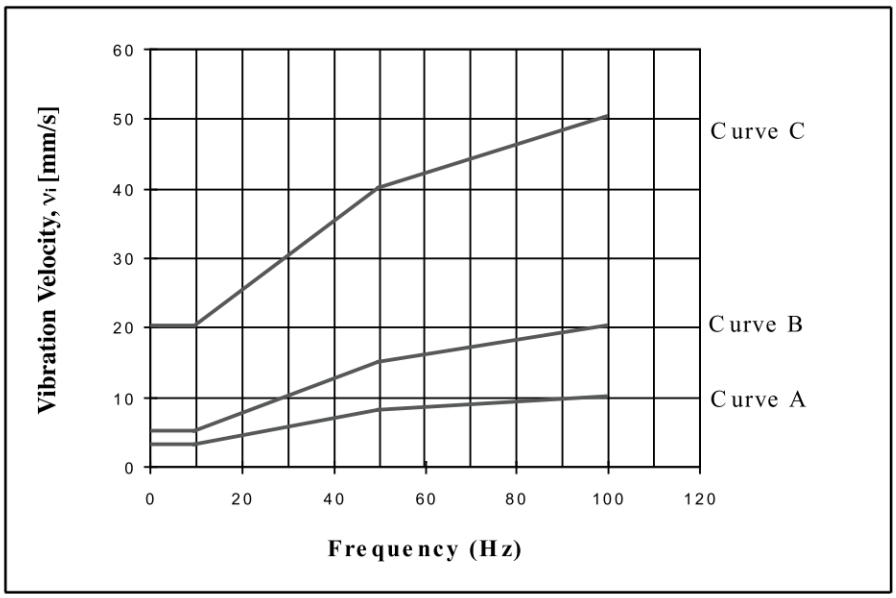

FIGURE 1

Foundation Vibration velocity Limiting Valures for Vectorial Sum of Vibration Levels in Three Orthogonal Axes.

SCHEDULE 5

RECOMMENDED LIMITS FOR HUMAN RESPONSE AND ANNOYANCE FORM STEADY STATE VIBRATIONS

Receiving Land Use Category	Day Time 7.00 am – 10.00 pm	Night Time 10.00 pm – 7.00 am
Vibration Sensitive Areas	Curve 1	Curve 1
Residential	Curve 2 to Curve 4	Curve 2
Commercial, Business	Curve 4 to Curve 8	Curve 4
Industrial	Curve 8 to Curve 16	Curve 8 to Curve 16

SCHEDULE 6

RECOMMENDED LIMITS FOR HUMAN RESPONSE AND ANNOYANCE FORM STEADY SHORT TERM VIBRATIONS

Receiving Land Use Category	Day Time 7.00 am – 10.00 pm	Night Time 10.00 pm – 7.00 am
Vibration Sensitive Areas	Curve 1	Curve 1
Residential	Curve 8 to Curve 16	Curve 4
Commercial, Business	Curve 16 to Curve 20	Curve 16 to Curve 20
Industrial	Curve 32	Curve 32

The above stipulated curves are defined in Figure 2 and 3. The base Curve 1 is based on the vibration perception threshold for human response as defined by BS 6472:1992 and ISO 2631. The designated numbers of subsequent curves are multiplying factors of the base curve.

(Source: ISO 2631 and BS 6472)

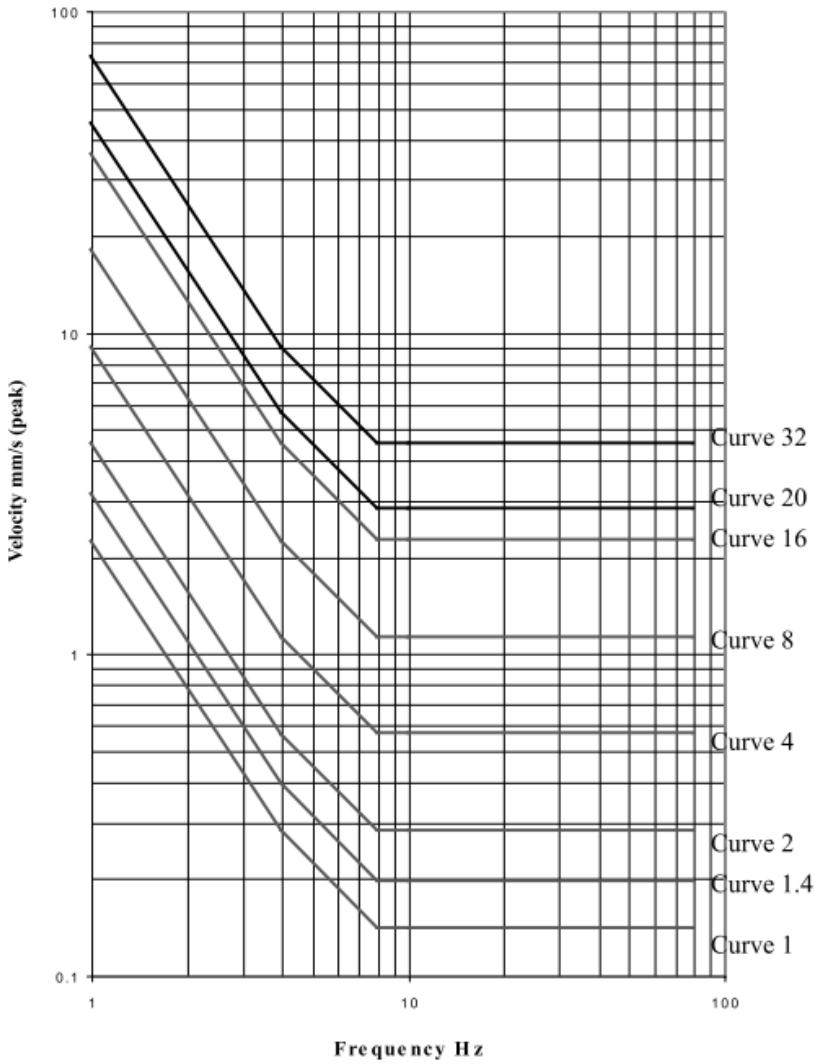

FIGURE 2. Building vibration z-axis curves for peak velocity

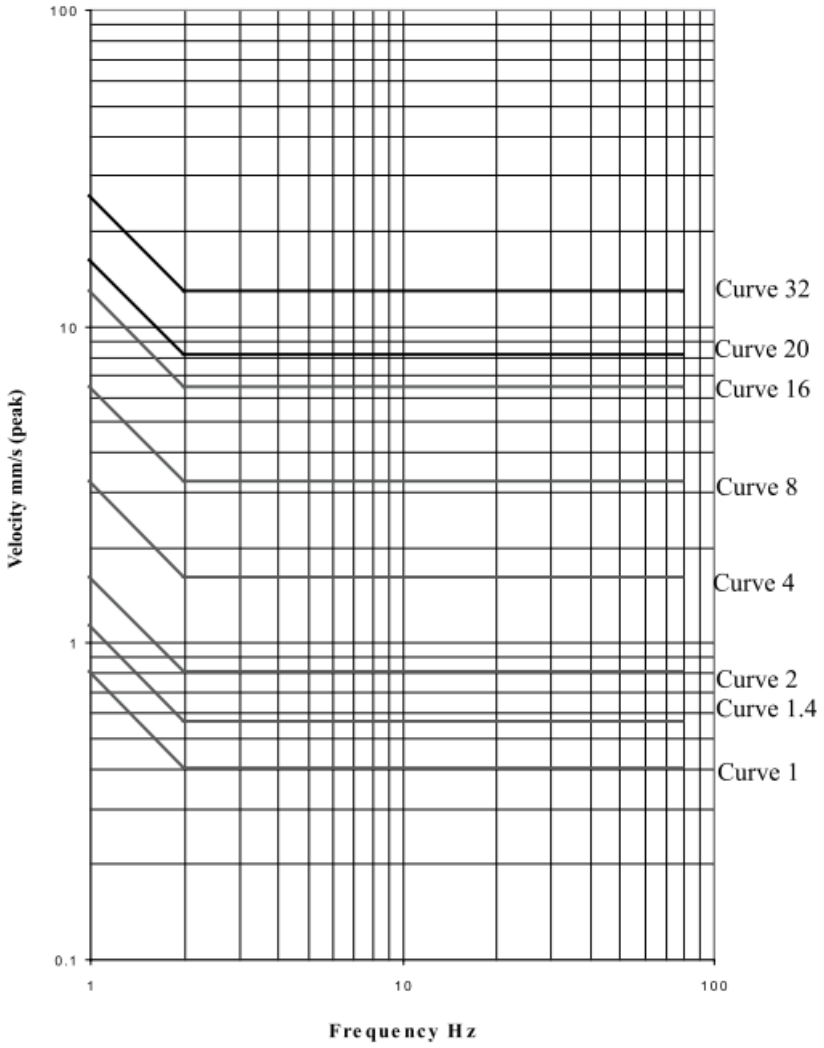

FIGURE 3. Building vibration x- and y-axis curves for peak velocity

APPENDIX D

APPENDIX D

SIA KATEGORI 1

BIL	KATEGORI	JENIS PEMBANGUNAN	CIRI-CIRI PEMBANGUNAN
1.	**PENEBUSGUNAAN PINGGIR LAUT**		
a.	Penebusgunaan Pinggir Laut	Penebusgunaan pinggir laut, termasuk pulau buatan	• Yang meliputi 50 hektar atau lebih; dan • Tidak termasuk penebusgunaan untuk pembinaan jeti atau pemulihan pantai (oleh JPS).
2.	**PENEBUSGUNAAN PINGGIR LAUT**		
a.	Lapangan Terbang	i. Lapangan Terbang Antarabangsa; ii. Lapangan Terbang Domestik; dan iii. Lapangan Terbang Tentera.	• Melibatkan lapangan terbang penumpang dan kargo; dan • Termasuk projek menaik taraf yang melibatkan perluasan kawasan melebihi 50% kawasan sedia ada, atau pembinaan landasan terbang baru, yang melibatkan pengambilan balik tanah.
b.	Pelabuhan Laut	i. Pelabuhan Nasional; ii. Pelabuhan Wilayah; iii. Pelabuhan Negeri – yang terletak di sempadan negeri; dan iv. Pangkalan Tentera Laut.	• Merangkumi pelabuhan penumpang dan kargo; • Termasuk projek menaik taraf yang melibatkan perluasan kawasan melebihi 50% kawasan sedia ada; dan • Tidak termasuk jeti penumpang, nelayan / APMM / Polis Marin.
c.	Pelabuhan Darat	Pelabuhan darat	• Semua pelabuhan darat; dan • Termasuk projek menaik taraf yang melibatkan perluasan kawasan melebihi 50% kawasan sedia ada.
d.	Rangkaian Pengangkutan Kereta Api	Landasan dan stesen kereta api	• Melibatkan kereta api penumpang dan barang; • Termasuklah kereta api laju, kereta api antara bandar; • Melibatkan landasan yang merentasi 2 negeri atau lebih; dan • Projek menaik taraf yang melibatkan pembinaan landasan baru yang melibatkan pengambilan balik tanah.

BIL	KATEGORI	JENIS PEMBANGUNAN	CIRI-CIRI PEMBANGUNAN
e.	Pelabuhan Laut	i. Lebuh raya ekspres (*expressway*); dan ii. Lebuh raya (highway)	• *Expressway* dan *highway* adalah seperti mana diklasifikasi oleh JKR dan LLM; • Lebuh raya hendaklah merentasi dua (2) negeri (termasuk Wilayah Persekutuan) atau lebih; dan • Termasuk projek menaik taraf yang melibatkan pengambilan balik tanah.
f.	Stesen Jana Kuasa	Loji dan stesen jana kuasa	• Semua loji dan stesen jana kuasa nuclear; • Loji dan stesen jana kuasa yang membekalkan kuasa kepada dua (2) negeri atau lebih (termasuk solar / *wind farm*); dan • Termasuk projek menaik taraf yang melibatkan pengambilan balik tanah.
g.	Empangan	i. Empangan bekalan air; ii. Empangan hidro elektrik; dan iii. Empangan pengairan.	• Melibatkan pembinaan empangan atau kolam takungan air dengan kawasan pembukaan seluas 100 hektar atau lebih; dan • Projek menaik taraf empangan yang melibatkan perluasan kawasan melebihi 50% kawasan sedia ada yang melibatkan pengambilan balik tanah.
h.	Tapak Pembuangan Sisa Toksik	Tapak pembuangan sisa toksik	• Semua tapak pembuangan sisa toksik; dan • Termasuk projek menaik taraf yang melibatkan perluasan kawasan melebihi 50% kawasan sedia ada yang melibatkan pengambilan balik tanah.
3.	**INFRASTRUKTUR LAIN YANG BERKEPENTINGAN NEGARA**		
	• Akan ditentukan oleh MPFN dari semasa ke semasa, dengan tumpuan kepada: - Infrastruktur yang merentasi dua (2) negeri atau lebih; dan - Infrastruktur yang melibatkan tadahan penduduk dua (2) negeri atau lebih.		

SIA KATEGORI 2

BIL	JENIS PEMBANGUNAN	CIRI-CIRI PEMBANGUNAN
1.	**PERBANDARAN BARU**	
a.	Perbandaran Baru	• Keluasan melebihi 100 hektar atau bilangan penduduk melebihi 10,000 orang; dan • Mengakibatkan penempatan semula komuniti sedia ada.
2.	**INFRASTRUKTUR UTAMA**	
a.	Lapangan Terbang (termasuk *short take off landing ports (STOLports)* swasta)	• Infrastruktur utama selain daripada yang termasuk di bawah SIA Kategori 1; dan • Infrastruktur yang dicadangkan di dalam kawasan *sensitive receptor* yang menimbulkan impak sosial ketara.
b.	Pelabuhan Laut (termasuk terminal kontena swasta)	
c.	Landasan Kereta Api dan lebuhraya termasuk *dedicated rail* dan lebuh raya swasta)	
d.	Empangan dan stesen jana kuasa.	
3.	**PEMBANGUNAN DI PUNCAK ATAU LERENG BUKIT**	
a.	Kawasan puncak atau lereng bukit	• Pembangunan seperti mana Panduan Pelaksanaan Akta 172 : Permohonan Cadangan Pemajuan Di Bawah Perenggan 22(2A)(c), Akta 172 (PPA 13) melibatkan: - Keluasan ≥ 20 hektar; - Kawasan pembangunan merupakan kawasan yang mempunyai lebih dari 50% kawasan berkecerunan 25°; dan - Cadangan pembangunan yang berdensiti tinggi iaitu ≥ 40 unit per ekar (100 unit per hektar) bagi cadangan perumahan dan ≥ 1:4 nisbah plot bagi perniagaan.

SIA KATEGORI 3

BIL	KATEGORI	JENIS PEMBANGUNAN	CIRI-CIRI PEMBANGUNAN
1.	Pusat Hiburan / Taman Tema	i. Pusat Hiburan; dan ii. Taman Tema	• Pembinaan baru termasuk projek menaik taraf pada skala yang menyumbang kepada sensitiviti masyarakat sekitar; dan • Terdapat di sekitarnya petempatan-petempatan yang dikhuatiri boleh menjejas kualiti hidup dan mendatangkan kacau ganggu dan lain-lain impak.
2.	Kawasan Perkuburan / Krematorium (Pembakaran mayat) / Kolumbarium	i. Semua jenis perkuburan (mengikut kaum); ii. Semua jenis Krematorium; dan iii. Semua jenis Kolumbarium.	• Kawasan perkuburan yang berskala besar yang menyumbang kepada sensitiviti masyarakat sekitar; dan • Terdapat di sekitarnya petempatan-petempatan yang dikhuatiri boleh menjejas kesejahteraan hidup, menjejas perpaduan komuniti, dan lain-lain impak; dan • Kolumbarium tidak mengira saiz.
3.	Perlombongan (Bergantung kepada PBT yang mengenakan KM)	i. Semua jenis perlombongan; ii. Termasuk semua jenis pecahan batu; iii. Kuari; iv. Pengorekan mineral; dan v. Pengorekan pasir.	• Terdapat di sekitarnya petempatan-petempatan yang dikhuatiri boleh mengalami kualiti persekitaran hidup yang terjejas termasuk pendedahan kepada keselamatan, bahaya dan bahaya.
4.	Kawasan Perindustrian Utama	Semua jenis kawasan perindustrian utama berskala besar.	• Terdapat di sekitarnya petempatan-petempatan yang dikhuatiri boleh mengalami kualiti persekitaran hidup yang terjejas termasuk pendedahan kepada keselamatan dan bahaya serta kacau ganggu; • Mewujudkan impat ekonomi dan kesejahteraan material kepada komuniti; dan • Mempunyai implikasi ke atas nilai hartanah sekitar.

BIL	KATEGORI	JENIS PEMBANGUNAN	CIRI-CIRI PEMBANGUNAN
5.	Projek akuakultur / penternakan berskala besar	i. Pusat Hiburan; dan ii. Taman Tema	• Terdapat di sekitarnya petempatan-petempatan yang dikhuatiri boleh mengalami kualiti persekitaran hidup yang terjejas termasuk pendedahan kepada keselamatan, bahaya dan pencemaran; • Mampu menjejas nilai persekitaran / kualiti estetik; dan • Meningkatkan bebanan infrastruktur fizikal dan menjejas daya huni petempatan sekitar.
6.	Loji dan Pusat Penapisan Minyak dan Gas	i. Pusat Hiburan; dan ii. Taman Tema	• Terdapat di sekitarnya petempatan-petempatan yang dikhuatiri boleh mengalami kualiti persekitaran hidup yang terjejas termasuk pendedahan kepada keselamatan dan bahaya seperti pengeluaran asap, letupan dan kebocoron minyak.
7.	*Incinerator* dan Tapak Pelupusan Sisa Pepejal	i. Pusat Hiburan; dan ii. Taman Tema	• Meliputi kawasan tadahan penduduk dua (2) negeri atau lebih; dan • Terdapat di sekitarnya petempatan-petempatan yang dikhuatiri boleh mengalami kualiti persekitaran hidup yang terjejas termasuk pendedahan kepada pencemaran seperti pencemaran bau.
8.	Lain-lain projek pembangunan yang ditentukan oleh PLANMalaysia@Negeri dan Pihak Berkuasa Tempatan (PBT) dari semasa ke semasa.		

APPENDIX E

APPENDIX E

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) CHECKLIST FOR PRESCRIBED ACTIVITY:

1) <u>FIRST SCHEDULE:</u>	**(a)**	**Construction of expressways.**
ACTIVITY 20:	**(b)**	**Construction of highways.**
ROAD	**(c)**	**Construction of road, tunnel or bridge traversing or adjacent or near to environmentally sensitive areas.**
2) <u>SECOND SCHEDULE:</u>	**(a)**	**Construction of new routes or branch line for a mass rapid transport project.**
ACTIVITY 16 : TRANSPORTATION	**(b)**	**Construction of new railway route or railway branch lines.**

A. This checklist shall be used by the EIA Consultant in assessing the EIA report prepared by the EIA Consultant, under the Environmental Quality (Prescribed Activities)(Environmental Impact Assessment) Order 2015, Environmental Quality Act, 1974.
B. All information disclosed and assessed in this checklist must be accurate, true, correct and based on critical issues of the proposed project and site.
C. The Project Proponent and EIA consultants shall be fully responsible for the information given/specified in this checklist.
D. Please tick in the box :-

<u>FIRST SCHEDULE –</u>
<u>ACTIVITY 20: ROAD</u>

☐ Activity 20 (a)
☐ Activity 20 (b)
☐ Activity 20 (c)

<u>SECOND SCHEDULE –</u>
<u>ACTIVITY 16: TRANSPORTATION</u>

☐ Activity 16 (a)
☐ Activity 16(b)

E. Please tick in the box as follows:-
√ - Complete; or X - Incomplete; or N.A - Not Applicable

1.0 PROJECT BACKGROUND

1.1 <u>Project Title</u>

_____

_____

_____

_____

1.2 Project Location

a. Alignment Coordinates

Longitude	Latitude

b. Total alignment length (km) : _____

c. Lot No./ P.T of ROW: _____

d. HSD/ HSM : _____

e. Mukim : _____

f. District : _____

g. State : _____

1.3 Project Approving Authority

a. Agency : _____

1.4 Project Proponent

a. Company Name: _____

b. Address : _____

_____

_____

_____

c. Company Registration No. : _____

d. Person In Charge : _____

e. Designation : _____

f. Telephone : _____

g. E-mail : _____

h. Fax : _____

1.5 EIA Consultant

a. Company Name: _____

b. Address : _____

_____

_____

_____

c. EIA Team Leader : _____

d. Registration No. : _____

e. Telephone : _____

f. Fax : _____

g. E-mail : _____

1.6 Terms of Reference (TOR)	**Tick and page number**
a. Letter of TOR comments from the Department of Environment (State Office) _____ b. Date of TOR letter : _____ c. Reference number: _____	☐ ☐

2.0 GUIDELINES, GUIDANCE DOCUMENTS AND OTHER REFERENCES	**Tick and page number**
2.1 List of guidelines, guidance documents and other references referred to during the preparation of the EIA report.	☐ ☐

3.0 EIA CONSULTANT 3.1 List of EIA Study Team Members (EIA Consultants and Subject Consultants). 3.2 A soft copy of the EIA report (including Executive Summary) - attached. 3.3 A soft copy of raw data used in the EIA study – attached.	**Tick and page number**
4.0 EIA REPORT 4.1 Documents – to be included at the beginning of the EIA report. a. List of EIA Study Team Members (EIA Consultants and Subject Consultants). b. List of Assistant Consultants. c. Declaration from Project Initiator. d. Declaration from EIA Study Team Leader. e. Declaration from EIA Team Members.	**Tick and page number**
4.2 <u>Executive Summary</u> (as a 'stand-alone' document) in addition to summarizing the main findings and issues, also containing the following information: a. Name / title of Project. b. Name & Contact Details of the Project Proponent (contact person, address, tel, fax, e-mail). c. Name of the EIA Consultant (firm) & Contact Person (Address, Tel, Fax, E mail). d. Location of the project (including where applicable, coordinates, lot numbers, sub-district and district name). e. Relevant maps showing project location and sensitive receptors. f. Brief description – project development and existing environment including baseline study. g. Summary of the main findings and issues mitigating measures. *<u>Note:</u> Executive Summary in two languages (English and Bahasa Melayu) shall be submitted to DOE in both hard copy and soft copy.*	**Tick and page number**

4.3 Introduction a. Title of the Project and Project Brief b. Project Proponent and consultant details. c. Project location. d. Relevant maps showing project location. e. Legal requirement f. In line with any development plans, policies or any decision of the Authority namely (but not limited to) National Physical Plan, Structure Plan, Local Plan and others.	**Tick and page number**
4.4 Statement of Need	**Tick and page number**
4.5 Project and Site Options a. Project options. b. No project option.	**Tick and page number**
4.5 Project Description a. Detailed explanation of the proposed project, size, components, and development phases. • Layout Plan as shown in Figure _____ b. Project Activities – Construction and Operational c. Work schedule outlining phases of development and activities involved.	

4.6 Description of Existing Environment	**Tick and page number**
a. Description on the sampling methodologies, location (with justification), monitoring stations and sampling parameters.	
b. Identification of the baseline data for the following environmental components :-	
a. Physico-chemical	
• Landuse	
• Topography	
• Bathymetry	
• Hydrology and Streamflow	
• Geology and soil	
• Surface water quality	
• Marine water quality	
• Groundwater quality	
• Air quality	
• Noise Level	
• Vibration Level	
b. Biological Diversity (Flora & Fauna)	
• Terrestrial/Forest Habitat - Upper Dipterocarp Forest - Hill Dipterocarp forest - Lowland forest - Peat swamp forest - Riparian forest - Limestone forest	
• Aquatic Habitat - Rivers/Streams - Lakes - Reservoirs - Swamps - Rice-fields	

- Marine & Coastal Habitat
  - Mangroves
  - Mudflats
  - Lagoons and estuaries
  - Beach Forest
  - Seagrass
  - Sandy beaches
  - Rocky shores
  - Coral reefs
  - Islands

c. Human

- Socio economic study
  - demography
- Aesthetic and Cultural/ Heritage
- Fishermen/ Orang Asli Community

c. Maps, diagrams, photos (clearly state the source of documents) which are included in the report such as (but not limited to) :-

i. Topography map as shown in Figure _____

ii. Survey plan as shown in Figure _____

iii. Geological map as shown in Figure _____

iv. Soil map as shown in Figure _____

v. Hydrology map as shown in Figure _____

vi. Borehole location as shown in Figure _____

vii. Landuse map within the coverage of at least 5 km radius with 250m interval as shown in Figure

viii. Nearest sensitive receptors as shown in Figure _____

ix. ESA map as shown in Figure _____

4.7 **Soil Erosion and Sediment Control Aspects**	Tick and page number
a. The chapter on Soil Erosion and Sediment Control Aspects was prepared by (name of the consultant) _____, who is a Certified Professional In Erosion And Sediment Control (CPESC) with the CPESC registration number_____, in accordance to the Guidelines on Land Disturbing Pollution Prevention and Mitigation Measures (LD-P2M2) by the DOE.	☐ ☐
b. The conceptual LD-P2M2 drawings indicating effective mitigating measures or Best Management Practices (BMPs) to be implemented on the site are described in chapter _ on page___of the EIA report, and illustrated in Figure___ on page___of the EIA report.	☐ ☐

4.8 **Potential Significant Impact**	Tick and page number	
a. Description of the methodologies used in the impact analysis/assessment. Explanation on the critical impacts and worst case scenarios using modeling and other internationally/locally acceptable methodologies.		
b. Predicted impacts of the following components:-		
(i) Landuse		
(ii) Topography		
(iii) Soil and Geology		
(iv) Drainage and Hydrology		
(v) Erosion and Sedimentation		
(vi) Water Quality-Surface		
(vii) Water Quality-Groundwater		
(viii) Water Quality-Marine		
(ix) Air Quality		
(x) Noise/Vibration		
(xi) Waste Management		
(xii) Biomass Management		
(xiii) Sewerage		
(xiv) Biological		
(xv) Socio economic		
(xvi) Transportation & Traffic		
(xvii) Aesthetic and Cultural/ Heritage		
(xviii) Other impacts (specify)		
_____		
_____		
_____		
_____		
_____		

4.9 Mitigation and Abatement Measures

	Tick and page number	
a. Based on prediction of impact studies on the affected environment components :-		
(i) Landuse		
(ii) Topography		
(iii) Soil and Geology		
(iv) Drainage and Hydrology		
(v) LD-P2M2		
(vi) Water Quality-Surface		
(vii) Water Quality-Groundwater		
(viii) Water Quality-Marine		
(ix) Air Quality		
(x) Noise/Vibration		
(xi) Biomass		
(xii) Waste Management		
(xiii) Sewerage		
(xiv) Biological		
(xv) Socio economic		
(xvi) Transportation and Traffic		
(xvii) Aesthetic and Cultural/ Heritage		
(xviii)Other mitigation measures (specify)		

_____

_____

_____

_____

_____

b. Cover all stages of development:- (i) Site Clearing/ Earthwork (ii) Building Construction (iii) Final Stabilization (iv) Project Abandonment	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
4.10 <u>Summary of Critical Issues/Impacts and Proposed Mitigation Measures</u> a. Critical issue/impact 1 (specify): _____ _____ Proposed mitigation measure(s) to mitigate/ minimize the impact (specify): _____ _____ b. Critical issue/impact 2 (specify): _____ _____ Proposed mitigation measure(s) to mitigate/ minimize the impact (specify): _____ _____ c. Critical issue/impact 3 (specify): _____ _____ Proposed mitigation measure(s) to mitigate/ minimize the impact (specify): _____ _____	**Tick and page number** ☐ ☐ ☐ ☐ ☐ ☐
4.11 Residual Impacts a. Identification of residual impacts and their significance. b. Recommendation for the management of residual impacts.	**Tick and page number** ☐ ☐ ☐ ☐

4.12 Framework of the Environmental Management Plan (EMP) a. Brief description of the components of the EMP.	**Tick and page number**
4.13 <u>Conclusion</u> a. Summary of the proposed project in terms of project concept, impacts and recommended mitigating measures. b. Recommendation by the EIA Consultant on the EIA report.	**Tick and page number**
5.0 DECLARATION OF SELF-ASSESSMENT **5.1 <u>EIA Team Leader</u>** I hereby declare on the followings:- a. The information provided in this assessment is correct, accurate, liable and represent the studies in the EIA report; and b. I shall be held liable for any misleading information in any part of this checklist. Signature : _____ Name : _____ MyKad / Passport No. : _____ Registration Number Validity : _____ Designation : _____ Date : _____ Official Stamp:	**Tick and page number**

Department of Environment
Ministry of Environment and Water

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