

9 ENVIRONMENTAL MANAGEMENT PLAN

9.1 Introduction

This section presents the environmental management requirements for the construction and operational phases of the proposed Project involving the construction of secure landfill for contouring and stacking of NUF residue. Effective management and monitoring of activities on the Project site are essential to ensure environmental objectives are achieved and are in accordance to regulatory requirements and best management practices.

In Chapters 7 and 8 of this report, the potential environmental impacts have been assessed and, appropriate pollution control and mitigation measures have been recommended to minimise these impacts. The mechanism for ensuring that these mitigation measures are effective, is by preparing and implementing an environmental management plan (EMP).

DOE is promoting self-regulation amongst industries in the effort to reduce the need for enforcement by the authority (DOE). The element of self-regulation is incorporated in the formulation of the EMP with the objective to enhance effectiveness of control and mitigating measures from development of projects.

9.2 Legislative Requirement

The requirement for an EMP is normally made as one of the conditions of approval of the EIA report. The EMP is to be prepared and submitted for approval of the State DOE prior to the implementation of a prescribed activity. The guidelines for the preparation and submission of the EMP is given in the *Guidance Document for the Preparation and Submission of EMP* issued by DOE.

9.3 EMP Content

A typical format of the document and the key information to be included in each of the chapters are presented below:

- **Chapter 1: Introduction:** The introduction outlines the objectives and scope of the EMP, and details of the environmental management requirements as stipulated by DOE.
- **Chapter 2: Policy:** This chapter outlines the Project Proponent's environmental policy, the organization's initiatives towards sustainable development and its long-term commitment to continuous improvement and compliance with the environmental requirements.
- **Chapter 3: Organization:** This chapter provides details for the parties responsible for environmental management, the organisation chart of the management team, the personnel certified for the management of scheduled wastes and pollution control systems, information

on the environmental consultants and the appointed third party laboratory, and the annual budget allocation to cater for expenditures involving environmental management or improvement measures including environmental monitoring and compliance audits.

- **Chapter 4: Training Requirements:** This chapter outlines the environmental training requirements for the environmental team to ensure that they develop the required competencies to perform their daily responsibilities with respect to environmental protection and regulatory compliance.
- **Chapter 5: Environmental Requirements:** This chapter lists the EIA approval conditions that the Project is required to comply with. Land disturbance pollution prevention and mitigating measures (LD – P2M2) or the Erosion Sediment Control Plan (ESCP) are to be included in this chapter. Details of the measures to control water pollution, air pollution, noise generation, solid and scheduled wastes management are to be included. Other information to be presented in this chapter includes the environmental monitoring program to be carried out throughout the construction and operation of the Project with information on sampling locations, frequency of monitoring and sampling method for assessment of ambient air quality and boundary noise, and water quality.
- **Chapter 6: Emergency Response Plan:** An ERP essentially describes the procedures and activities which are to be put in place to mitigate and control the all potential hazards onsite. The ERP defines the roles and responsibilities and emergency contact details of site personnel, relevant government bodies and third parties authorized to take action. Lynas had developed an ERP specific to the management of the NUF in February 2019. The scope of the ERP covers both on-site and off-site response and is described under Section 9.6. The complete document is provided in **Appendix 9.1**.

9.4 Implementation of the EMP

The primary objective of the EMP is to ensure sound environmental practices are adhered to during the construction and operational phases of the Project. It is also to monitor the impacts to the surrounding environment during the course of the Project development. The actions and measures detailed in the EMP are to be implemented by all parties involved, including the representatives from the management of the Project Proponent, appointed Contractors, consultants and laboratory.

The following management procedures are recommended to ensure proper implementation of the EMP:

- The contract between Lynas and the appointed Main Contractor appointed for the construction of the DSFs will specify that the Contractor and its sub-contractors (if any) are required to adhere to the environmental protection measures recommended in the EIA, EMP, the legal provisions of the Environmental Quality Act, 1974 and other relevant requirements.
- An Environmental Officer (EO) with a background in environmental management and preferably registered under the Certified Erosion, Sediment and Stormwater Inspector (CESSWI) scheme will be appointed to assume responsibility for the execution of the EMP throughout the duration of the construction phase.
- The appointment of an officer registered under the Certified Professional in Scheduled Waste Management in Scheduled Waste Management (CePSWaM) scheme is recommended to better manage the NUF produced upon operation of the landfill.
- Findings of both internal environmental compliance audits as well as independent third party audits will form the basis of corrective actions to be resolved by the Main Contractor and/or their sub-consultants.

While the EMP itself will be crafted based on as-is design of the proposed landfill, any unexpected change in design or undesired incidents that occur during its construction will need to be captured. As such, it is recommended for a review of the EMP to be done yearly or as needed to ensure any unexpected events that occur during its construction and operation are properly captured and addressed in the document with the necessary recommendations in order to prevent any future recurrence.

9.5 Environmental Monitoring and Auditing

The requirement for regular monitoring and auditing of discharges from the Project is an integral part of the EMP and is often one of the conditions of EIA approvals. The frequency of monitoring and reporting to DOE need to be specified in the EMP. Monitoring, sampling and analysis of samples are to be carried out by analytical laboratories which are accredited under the Skim Akreditasi Makmal Malaysia (SAMM) by the Department of Standards of Malaysia (DSM) / Jabatan Standard Malaysia (JSM).

9.5.1 Baseline Environmental Quality

The environmental quality data presented in Chapter 6 of this report provides a general indication of the baseline environmental conditions (prior to the construction of the 4 DSFs) at the time of reporting. The data obtained is deemed to represent the Project site's baseline conditions. The results obtained from the monitoring programme carried out during the construction and operational phases will be compared against these baseline conditions, and the findings will be used to indicate if the Project implementation activities have attributed to any changes in the surrounding environment, and to assess the effectiveness of the mitigation measures.

9.5.2 Environmental Monitoring Program

The objectives of the environmental monitoring programme are:

- To develop a database to facilitate the identification of any short- or long-term environmental impacts arising from the construction and operations of the Project;
- To provide an early indication if any of the environmental control measures or practices are failing to achieve the acceptable standards; and
- To provide environmental quality data to support the findings of the compliance audit during both the construction and operational phases of the Project.

The LAMP has in place a periodical environmental monitoring programme as dictated by the 2008 EIA approval condition. The monitoring programme encompasses the monitoring of ambient air quality, water quality, groundwater quality and boundary noise level. Details of these programmes have been discussed under Chapter 6 of this report.

For the proposed Project, it is recommended that the existing environmental monitoring programme retain its current locations and parameters provided in **Table 9.1**. A periodical review of the programme however is recommended to take into account any regulatory requirement or due to any change in the NUF landfilling activities. Regardless, any changes to the monitoring program will be reflected in the final EMP document to be prepared and submitted to the Pahang State DOE

Table 9.1: Proposed Environmental Monitoring Program

Station	Description	Coordinate	Parameter
Ambient Air Quality			
A1	At an open space located at the southeast corner of the LAMP site	04° 00' 15.0" N 103° 23' 01.6" E	TSP, PM ₁₀ , SO ₂ , NO ₂ , NO, H ₂ SO ₄ , HF, Ac Mist, CO, CO ₂
A2	At an open space located at the northeast corner of the LAMP site	04° 00' 29.4" N 103° 22' 53.9" E	
A3	At an open space located at the southwest corner of the LAMP site	03° 59' 54.8" N 103° 22' 24.5" E	
A4	At an open space located at the northwest corner of the LAMP site	04° 00' 18.0" N 103° 22' 16.0" E	
Water Quality			
W1	Sg Balok at estuary	3° 56' 10.4" N 103° 22' 40.2" E	pH, DO, BOD, COD, TSS, AN, Ca, Fe, Mn, Conductivity
W2	Sg Tunggak pre-confluence into Sg Balok	3° 56' 18.9" N 103° 22' 33.6" E	
W3	Upstream of discharge drain from Taman Balok Perdana	3° 57' 14.1" N 103° 21' 53.3" E	
W4	Upstream of discharge drain from Gebeng Area	3° 57' 49.4" N 103° 21' 47.0" E	
W5	Upstream of discharge drain from BASF	3° 58' 32.1" N 103° 21' 26.5" E	
W6	Along Sg Balok, about 475 m north of W5	3° 58' 42.7" N 103° 21' 25.9" E	
W7	Under the FR2 bridge (Sg Ular-Gebeng Bypass)	4° 00' 22.2" N 103° 21' 06.7" E	
W8	Between W5 and W6	3° 58' 36.6" N 103° 21' 25.3" E	
W9	Downstream of bridge to Gebeng Rail Station	3° 59' 35.3" N 103° 21' 34.1" E	
W10	About 50m upstream of SRP discharge	3° 59' 50.7" N 103° 22' 25.6" E	
W11	About 850m upstream of SRP discharge	4° 00' 00.9" N 103° 22' 49.9" E	
Effluent Quality			
EF1	Final discharge point	4°00'13.6"N 103°22'38.8"E	pH, Temp, BOD, COD, SS, Hg, Cu, Mn, Zn, Bo, Fe, Al, Fluoride, Phenol, AN, Ag, Se, Ba, Colour, Chloride
Noise			
N1	At an open space located at the southeast corner of the LAMP complex	04°00' 15.0" N 103° 23' 01.6" E	LAeq
N2	At an open space located at the northeast corner of the LAMP complex	04° 00' 29.4" N 103° 22' 53.9" E	
N3	At an open space located at the southwest corner of the LAMP complex	03° 59' 54.8" N 103° 22' 24.5" E	
N4	At an open space located at the northwest corner of the LAMP complex	04° 00' 18.0" N 103° 22' 16.0" E	
Groundwater Quality			
MW1	At an open space located at the northeast corner of the LAMP site	4° 00' 29.7" N 103° 22' 59.3" E	Pb, Cr, Ba

Station	Description	Coordinate	Parameter
MW2	Located beside the eastern border of NUF GT 1.5	4° 00' 17.5" N 103° 23' 02.0" E	
MW3	Located just east of the LAMP site western boundary	4° 00' 18.1" N 103° 22' 17.0" E	
MW5	Located southwest of NUF DSF 1	4° 00' 00.3" N 103° 22' 44.8" E	
MW11	Located along the northern border of the WLP RSF 3	4° 00' 23.8" N 103° 22' 37.4" E	
MW12	Located along the southern border of NUF DSF 2	4° 00' 05.0" N 103° 22' 56.2" E	
MW13	Located at the southwest corner of the LAMP site	3° 59' 54.0" N 103° 22' 25.2" E	

9.5.3 Enforcement Through Self-Regulation

The Environmental Mainstreaming Tools and Guided Self-Regulation (EMTGSR), issued by the DOE in June 2017 serves as guidelines for ensuring compliance through self-regulation. The tools in the EMTGSR include having a clear environmental policy, establishing an environmental committee, competent persons for environmental facilities and environmental reporting and communications.

Most of the implementation of the mitigating and control measures are dependent on the responsibility and self-regulatory initiative of the parties concerned, namely the Project Proponent, the Main Contractors and the Environmental Officer (EO). The role of the EO is critical to monitor the effectiveness of the mitigating measures implemented. The EO is required to have the necessary background and training, and be familiar with the Project approval conditions as well as other relevant environmental legislations that the Project is required to comply with.

The duties and responsibilities of the EO include to conduct regular inspection of all the BMPs adopted, particularly during the site preparation, earthworks and construction phases as well as to prepare the necessary site inspection reports and corrective actions as needed. Further to this, the EO is also expected to conduct *in-situ* sampling after heavy rain events to ensure compliance and effectiveness of the BMPs in place. Other responsibilities of the EO include supervising all sampling and monitoring exercises conducted, accompany third party auditors (DOE or others) during site inspection and provide access to relevant documents for review.

9.5.4 Environmental Compliance Audit

The primary objective of the environmental audit is to assess the compliance of the Project's activities against the recommendations of the EMP and the Environmental Quality Act, 1974. It is recommended that the environmental audits to be carried out on a quarterly basis (once every 3 months) during the construction phase or as and when deemed necessary by the Director General of DOE.

The audit shall be undertaken by an Environmental Auditor who is registered with DOE under the Environmental Auditor's Registration Scheme introduced in 2010. The auditor also needs to have the required CESSWI (Certified Erosion, Sediment and Storm Water Inspector) qualification for audit of construction sites. The audit protocol, procedures and reporting requirements will be in accordance to the Environmental Audit Guidance Manual (1/2011 Edition) published by the DOE.

The audit will involve a review of the relevant permits and licences required by the DOE, environmental monitoring data, review of complaints received from the public (if any) and other related issues as well as a thorough inspection of site activities. The results of the audit will be used to identify any weaknesses in the EMP and to provide information for updates where necessary.

9.6 EMERGENCY RESPONSE PLAN (ERP)

i. Introduction

The Emergency Response Plan (ERP) is a document that describes the policy organisation, arrangements and evaluations to ensure preparedness in responding to reasonably foreseeable emergency situations arising from the transportation and contouring/stacking of NUF. It also forms as part of the whole Site Emergency Response Plan and Preparedness of Lynas. The ERP prepared by Lynas for this proposed Project is in compliance with Environmental Quality (Scheduled Wastes) Regulations 2005, EQA 1974. The full ERP report is appended in **Appendix 9.1**.

The typical emergency events likely to occur at the Project site during the construction phase include the following:

- NUF slurry spillage from the HDS bunded area;
- Spillage of NUF residue during transport; and
- Leak in the double liner layer of the NUF DSF

In terms of content, an ERP would contain the following list of information:

- The type of emergency
- A detailed flowchart of action to be taken at each step of the emergency;
- A list of action party for each step of the emergency;
- A list of designated persons with their roles & responsibilities and contact numbers (ERT); and
- A list of contact numbers of relevant authorities (Police, Bomba, DOE, DOSH, etc.).

As part of the ERP, details on the Emergency Response Team (ERT), are also to be included. Such details to include their name, designation in an emergency, scope of responsibilities as well as their contact details. **Table 9.2** provide a generalised view of some of the roles and responsibilities in the ERT.

Table 9.2: Roles and Responsibilities of an Emergency Response Team (ERT)

Role	Responsibilities
Emergency Controller (EC)	<ul style="list-style-type: none"> • The EC will be the Site Director (General Manager of LAMP) or his appointee. • The EC will provide and coordinate the necessary emergency support to the On-Scene Commander • The EC will ensure communication and notification to the relevant stakeholders and regulators (e.g. DOSH, DOE, AELB etc.) • The EC will update corporate on the status and impact of the emergency. • The EC will appoint an accident investigation team to investigate and report the accident related to the emergency immediately after the emergency is under control.

Role	Responsibilities
On Scene Commander (OSC)	<ul style="list-style-type: none"> The OSC will assess the emergency site and the status of the interphase between the emergency site and the adjacent operation in the plant. The OSC will decide the scale of the emergency, the severity of the impact and subsequently declare the level of emergency. In an emergency, the OSC will always be in contact with the EC of the plant and keep them updated on the status of the emergency.
Emergency Response Team Leader (ERTL)	<ul style="list-style-type: none"> The ERTL is a person in charge of a particular emergency response. In the event of an emergency, the ERTL will first receive instructions and comply with all instructions issued by the EC. The ERTL will lead the emergency response team in activities related to mitigating the impact of the emergency.
Emergency Response Team (ERT)	<ul style="list-style-type: none"> The ERT will comprise shift members who are specifically trained to respond to the various emergency scenarios including that related to radiation sources. The ERT will be mobilised and demobilised upon instruction of the OSC.
Emergency Management Team (EMT)	<ul style="list-style-type: none"> During emergency response, the Lynas EMT will be called together to manage the business aspects of any crisis or emergency beyond site capabilities or boundaries. The Lynas EMT comprises a core of professional functions (human resources, safety, health, environment, finance etc.) and technical expertise. The Lynas EMT controls the consequences operational, environmental, personnel impacts and financial of a physical incident within the operations group.
Supporting Finance and Administration	<ul style="list-style-type: none"> The Human Resource Support Team is responsible for ensuring the welfare of all personnel and casualties involved in the emergency. The Human Resource Support Team supports the EC in the liaison with regulatory authorities The Emergency Logistic and Procurement shall provide and arrange for emergency support services (e.g. air, sea and land transportation, medical support), co-ordinate and mobilise the necessary services and materials to the emergency scene. The Technical Support Team (TST) shall provide immediate technical solutions. Requirement for this team to be mobilized depends on the nature and scale of an emergency. The Finance & Legal Team shall contribute legal and other advices with regard to the emergency. The team shall co-ordinate all documentations from the EMCT that could be required for future insurance/legal claims.

**Note: Depending on the type of activity and location, the roles may be changed to suit the current situation*

Any ERP constructed for the plant's operation must be well communicated to all levels of employment; be it temporary or permanent, and must be made accessible to all related parties. However in carrying out the ERP, the plan must be initiated by the designated personnel upon receipt of notification on the incident. Such responsibility therefore falls onto either the Project Director, Project Manager or the Health, Safety and Environment (HSE) Officer.

In light of this, the LAMP ERT may also synchronise their efforts with the Gebeng Mutual Emergency Aid; a designated local response team crafted to mutually and effectively address any

industrial incidents occurring within the industrial park. Membership of said committee comprise of mainly HSE personnel from the various industries operating in the area along with government representation from agencies such as DOE, DOSH and BOMBA.

Specific to the management of the NUF produced, **Appendix 9.1** details the roles and emergency procedures of various parties within LAMP operations in addressing NUF-related incidents occurring whether on-site, off-site or during transport.

ii. Emergency Contact List

Table 9.3 outlines the list of contact number of relevant authorities in case an emergency occurs.

Table 9.3: Contact Number of Relevant Local Authorities

Local Authorities	Telephone no.
IPD Kuantan	09 - 513 2222 / 2512
Pondok Polis Kawasan Perindustrian Gebeng	09-551 9999
Balai Bomba dan Penyelamat Gebeng	09-583 7977
IIUM Medical Center	09-591 2500
Hospital Tengku Ampuan Afzan Kuantan	09-557 2222
Kecemasan	999
DOE Pahang	09-573 0636
DOSH Pahang	09-513 2906

The project proponent is also advised to include the contact details of their respective emergency response team in the emergency contact list.