

ES

EXECUTIVE SUMMARY

PROPOSED FERROALLOY PLANT ON PARTS OF LOT 6294 AND LOT 60131 AT TELUK KALUNG INDUSTRIAL ESTATE, KEMAMAN, TERENGGANU

1 | INTRODUCTION



PROJECT BACKGROUND

Eastern Steel Sdn. Bhd. (ESSB) is an **iron and steelmaking** company located within **Teluk Kalung Industrial Estate (TKIE)** in Kemaman, Terengganu.

ESSB owns and operates the **Integrated Iron and Steel Mill (IISM)** which manufacture a range of steel products and has been **operating since year 2015**.



PROJECT CONCEPT

The Project involves **construction and operation of a ferroalloy plant** within the existing IISM.

The Project will be developed in **2 phases**:

- **Phase 1:** 120,000 MT/year
- **Phase 2:** 120,000 MT/year
- **Total Maximum Production Capacity:** 240,000 MT/year



PROJECT LOCATION

The Project site is located on **parts of Lot 6294 and Lot 60131 at TKIE** with a total area of approximately **11.1 ha (27.4 ac)**.



Boundary Point	Latitude	Longitude
A	4°17'18.88"N	103°25'26.45"E
B	4°17'18.90"N	103°25'45.81"E
C	4°17'14.53"N	103°25'45.45"E
D	4°17'8.13"N	103°25'31.06"E
E	4°17'8.11"N	103°25'25.15"E

PROJECT PROPONENT



Eastern Steel Sdn. Bhd.
Lot 6293 & 6294,
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QUALIFIED PERSONS



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LEGAL ASPECTS

Second Schedule Prescribed

Activity 6(a)(iii) – Non-ferrous: primary smelting other non-ferrous (producing 50 tonnes product or more per day)



CONFORMANCE TO THE GOVERNMENT'S PLANS

- Twelfth Malaysia Plan 2021 – 2025
- Rancangan Fizikal Negara 4
- Draf Rancangan Struktur Negeri Terengganu 2050 (Kajian Semula)
- Rancangan Tempatan Daerah Kemaman 2035
- East Coast Economic Region Master Plan
- Environmental Essentials for Siting of Industries in Malaysia (EESIM) 2017



EIA STUDY APPROACH

The approach taken is based on the guidelines listed down in the **“Environmental Impact Assessment Guideline in Malaysia”**.

2 | T E R M S O F R E F E R E N C E



The Revised TOR and ESI of the EIA was submitted to the DOE HQ on 15th November 2021. DOE HQ has **endorsed the TOR on 23rd December 2021** via endorsement letter reference JAS 600-2/6/38(17).

3 | S T A T E M E N T O F N E E D



REDUCE COST

The Project will manufacture **silicomanganese alloy product** which can be used as **intermediate alloy** for the steel-making production within ESSB.

Logistic costs of importing the alloy from overseas can be **drastically reduced**.

Increase the flexibility to change the **product's specification**.

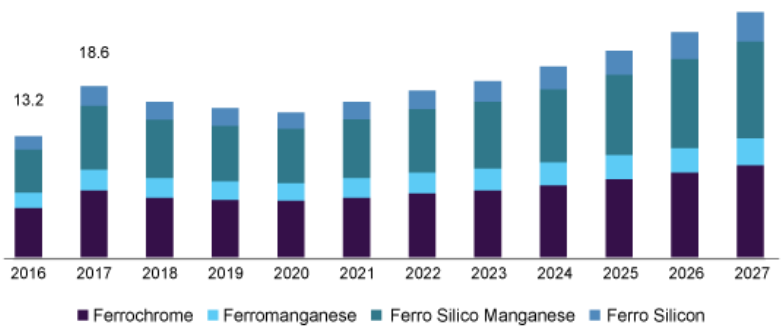
Improve quality control of the product.



STIMULATING NATIONAL ECONOMY

This Project is able to **capitalize** and **meet the growing demand** of **ferroalloy product consumption** which is expected to increase globally.

China ferroalloys market size, by product, 2016 - 2027 (USD Billion)



Source: www.grandviewresearch.com



PROMOTING LOCAL ECONOMIC DEVELOPMENT

Spurring development of **upstream and downstream companies** in TKIE.

Companies and local communities near TKIE stand the chance to benefit from Project development in terms of **income growth** and **job creation**.

4 | P R O J E C T O P T I O N S

NO PROJECT ALTERNATIVE



Increased logistic cost to import SiMn alloy for production of iron & steel



Impede socio-economic growth in manufacturing industries & service sector in the east coast region



Hinder job creation & potential business opportunities from development of Project

TECHNOLOGY ALTERNATIVES

1

Furnace System: Submerged Arc Furnace

Alloy is smelted in a refractory-lined cup shaped steel shell by submerged graphite electrodes

2

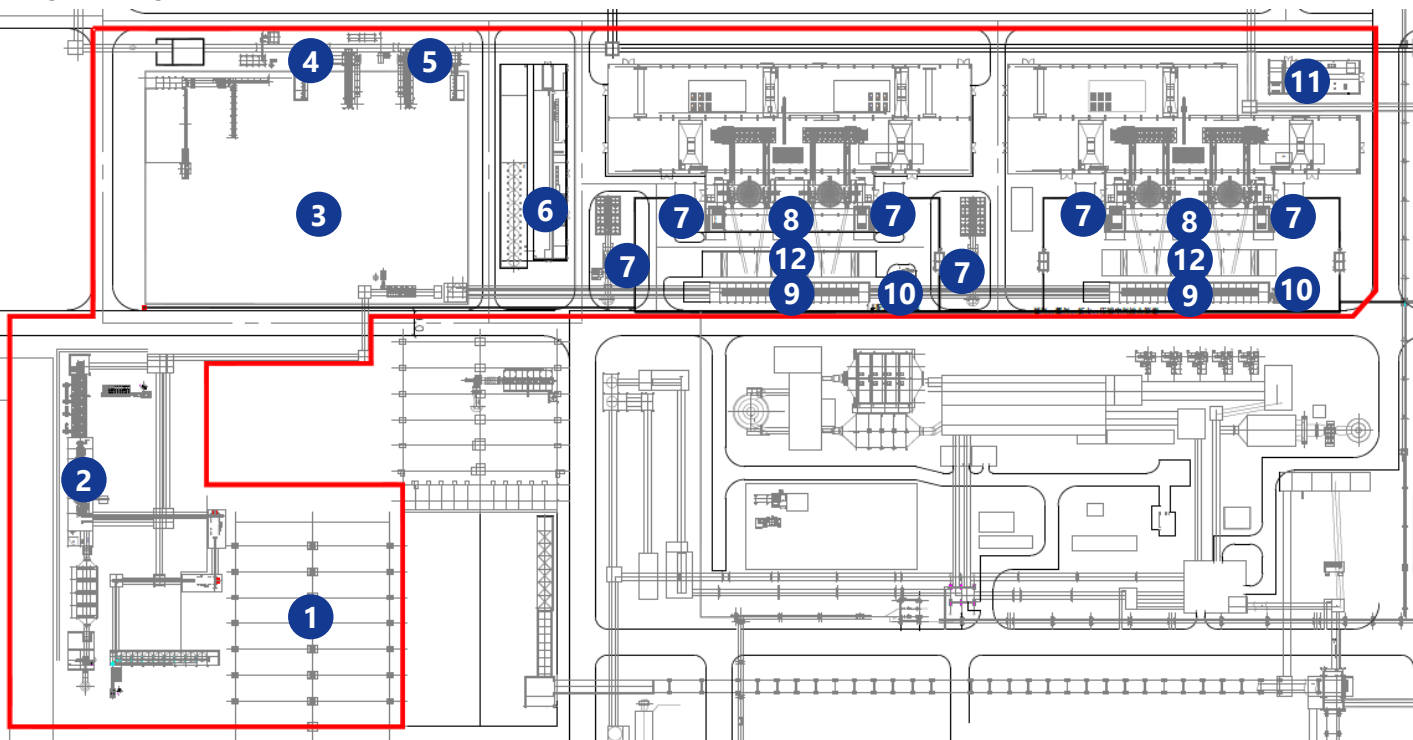
Furnace Type: AC Electric Arc Furnace

- Lower installation costs
- No bottom electrode
- Higher power rating for greater heat generation

5 | PROJECT DESCRIPTION

PROJECT COMPONENTS

The layout of the Project is reasonably aligned and partitioned in order to optimize the engineering requirements of construction, operation and maintenance.



No	Components	Description
1	Sintering Material Shed	Store sinter produced from sintering machine
2	Sintering Machine	Convert manganese ore fines and coke powder into a sinter product
3	Comprehensive Stockyard	Holding and storage area for sinter and raw materials that will be fed into the Submerged Arc Furnace
4	Crushing and Screening Machine	Crushing raw material to the desired dimension and specification
5	Coke Crushing	Crushing coke before fed into the Submerged Arc Furnace
6	Circulating Water Pump Station	To provide cooling water for the production process
7	Baghouse Filter	Remove dust from flue gas before released to the atmosphere
8	Submerged Arc Furnace	Converts raw materials into SiMn alloy product
9	Batching Station	Weighing of raw materials
10	Batching Dedusting	Venting system to draw fugitive dust from Batching Station
11	Motor Shell Repairing Workshop	Area to weld electrode shells used in the Submerged Arc Furnace
12	Slag Quenching System	To cool down slag generated from the Submerged Arc Furnace

The component of the proposed ferroalloy plant for Phase 1 and Phase 2 is as follows:

Project Phase	Component	Unit
Phase 1	Raw Material Storage Yard	2 units
	Sintering Plant	1 unit
	Submerged Arc Furnace	1 unit
	Slag Quenching System	1 unit
Phase 2	Submerged Arc Furnace	1 unit
	Slag Quenching System	1 unit

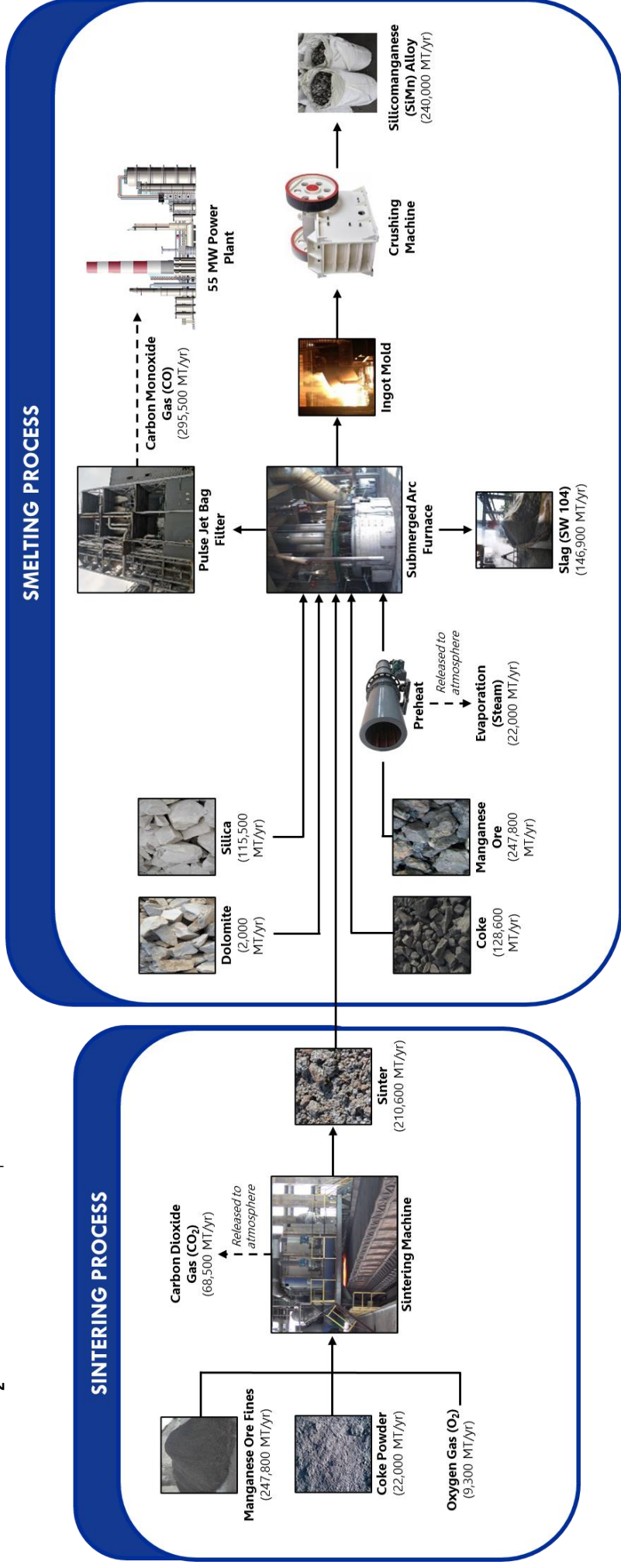


PROCESS DESCRIPTION

The Project involves the development of a ferroalloy plant for the **manufacturing of silicomanganese alloy (SiMn) product** within the premise of an existing Integrated Iron and Steel Mill (IISM). The production of SiMn product in the proposed ferroalloy plant is comprised of **2 main processes**, namely:

1. Sintering process
2. Smelting process

The main chemical reaction equation for the production of SiMn is as follows:



Legend:

- Within Ferroalloy Plant
- - - → Outside Ferroalloy Plant



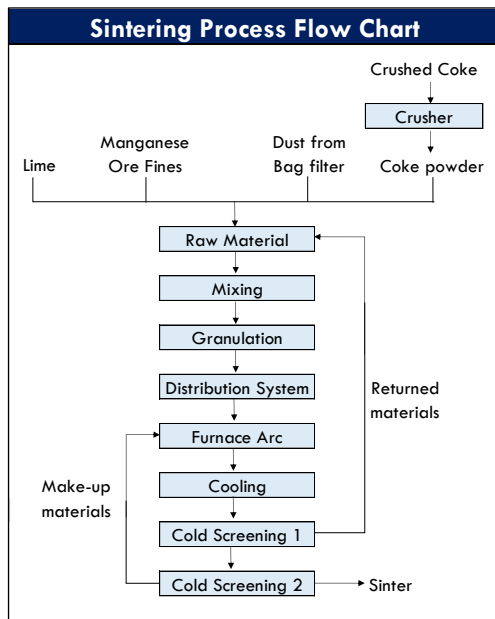
RAW MATERIAL STORAGE YARD

The raw material storage yard will have an area of **28,500 m²** and a storage time of various raw materials for about **7 days**. Raw materials are comprised of **manganese ore, silica, dolomite, coke and carbon electrode**. The raw materials will be stored in **compartments and concrete floor** as well as equipped with **sump pits**.



SINTERING MACHINE

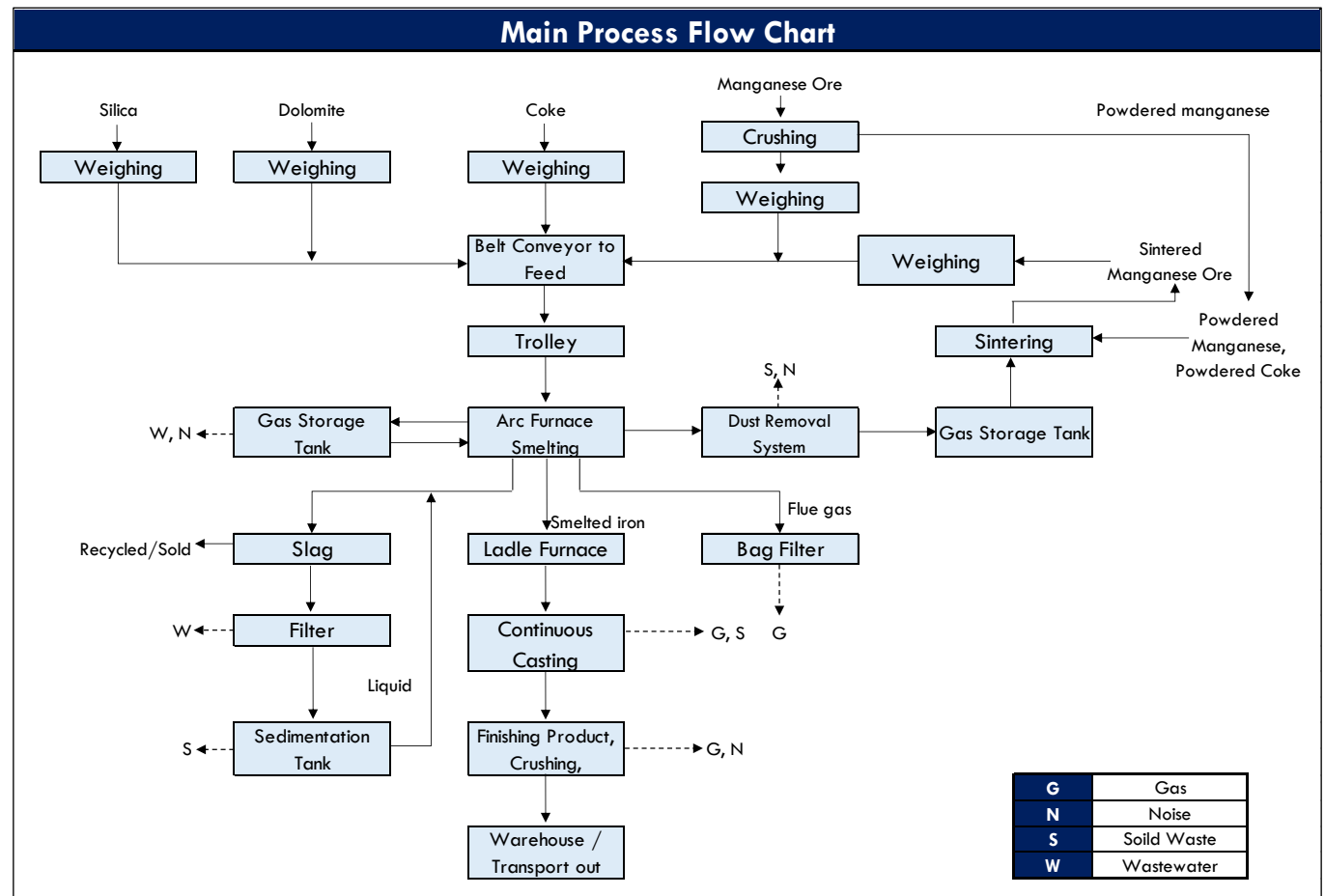
Mixed raw material will be **evenly distributed** on the sintering machine trolley and **ignited**. The hot sintered cake will be **crushed** to approximately **5mm to 150mm** depending on the desired output specification. The sinter will then be cooled and unloaded onto a belt conveyor where it will be transported to the finished sintering room for **granulation**.



SUBMERGED ARC FURNACE

Very **high electrical current** will be passed down through graphite electrodes **smelting all the raw materials** in the furnace with a reaction temperature ranging from **1,350 °C to 1,400 °C**. The carbon source (i.e., coke, sinter, etc.) will react with metal oxides (i.e., manganese ore) to form carbon monoxide (CO) gas while the manganese ore will be reduced to its base metal form.

CO gas after gas purification system will be channeled to the 55MW power plant outside the proposed ferroalloy plant which will be used for **electricity generation** within the IISM. Molten alloy accumulated on the furnace hearth will be tapped into a ladle at a regular interval. The **silicomanganese alloy lumps will be cooled and further crushed** by the crushing machine to the desired size and specifications. Slag generated from the smelting process will be **separated and removed**.

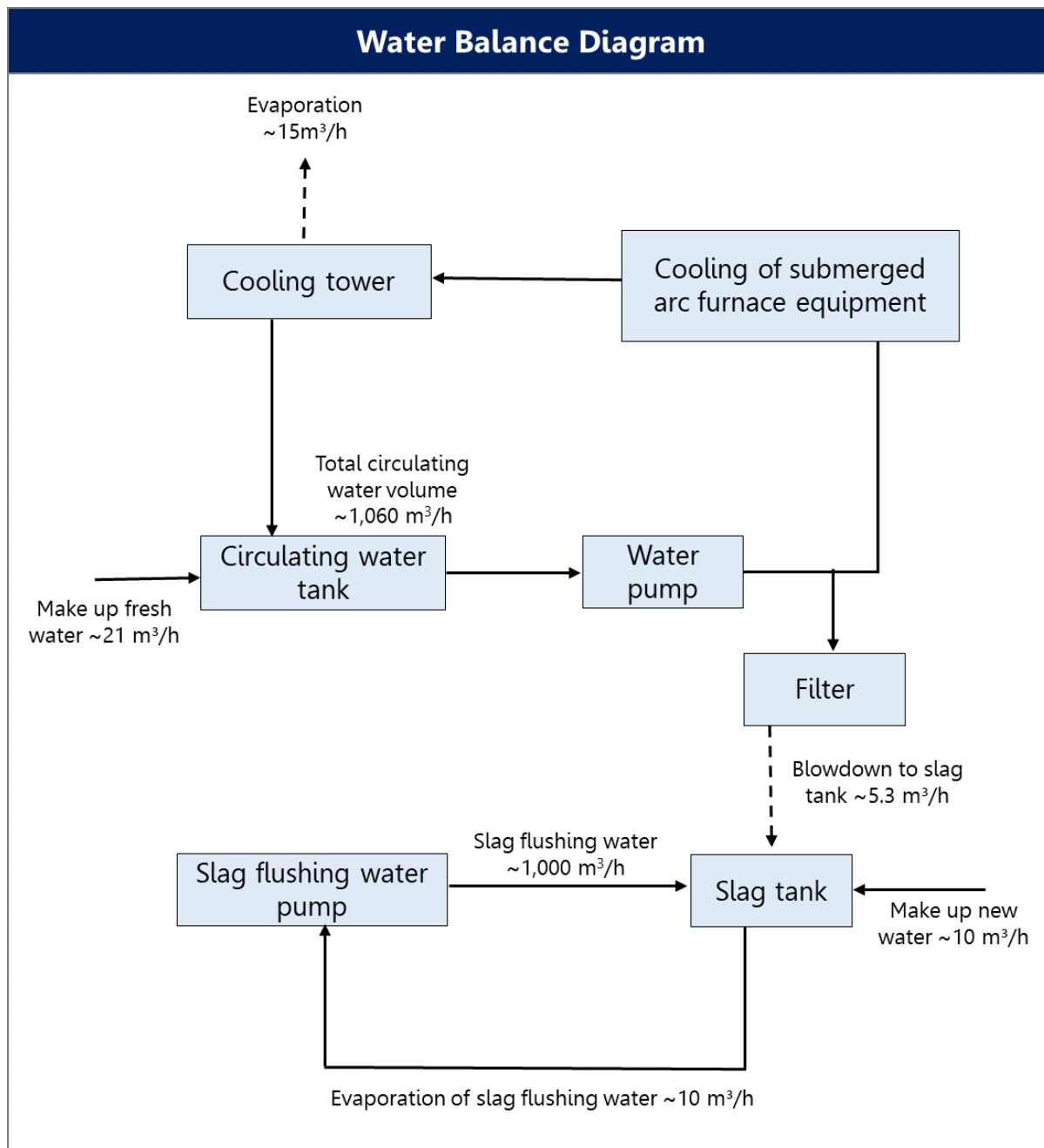




CIRCULATING WATER PUMP STATION

There will be **no generation of industrial process wastewater** from the Project operation. Water will be used to cool the submerged arc furnace and subsequently enter the water quenching slag system (via blowdown) to cool down the slag generated from the smelting process.

Water will be **fully-recirculated within the closed-system**, with occasional requirement for top-up water to compensate for the water loss during the evaporation process.





PRODUCT

The Project will manufacture **silicomanganese alloy (SiMn) products** with a total production capacity of **240,000 MT/year**

SiMn is used as a **deoxidizer** and **alloying element** in steel. SiMn product is a **lumpy material** with **silvery metallic surface**. The product will be **crushed** and **graded** into **predetermined grain sizes** according to customer specification and sold either in **bulk bags** or simply **bulk loaded into closed containers**.

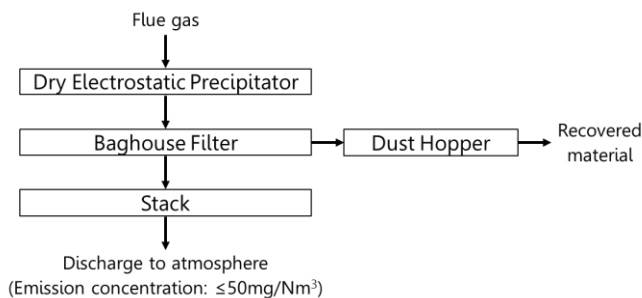


AIR POLLUTION CONTROL

Emissions are ensured to comply with limits stipulated in the **Environmental Quality (Clean Air) Regulations 2014**. Besides APC system at the sintering machine and submerged arc furnace, there will also be several **dust hoods** strategically located at the **raw material processing areas** and **batching stations** to **draw fugitive dusts into baghouse filters** to ensure ambient air quality within the Project site is under control and safe for workers.

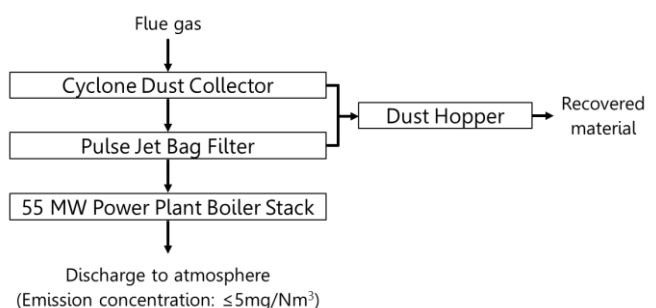
SINTERING PROCESS

During the sintering process, flue gas generated from the main smoke extractor will be channelled to **dry electrostatic precipitator (ESP) & baghouse filter**.



SMELTING PROCESS

During the smelting process, flue gas generated from the submerged arc furnace will be channelled to **cyclone dust collector & pulse jet bag filter**.



WASTE MANAGEMENT

Waste generated from the Project site is comprised of **solid waste** and **scheduled waste**. Project Proponent will manage both types of waste accordingly:

SOLID WASTE

Dust collected by APC system will be **reused** as materials for the manufacturing of SiMn product. Domestic waste which cannot be reused or recycled (e.g., food and packaging waste) will be sent to **Bukit Takar Landfill** or approved facilities for disposal.

SCHEDULED WASTE

Slag generated from the smelting process will consist of various ferrous compounds such as **SiO₂, SiC, CaO, MgO, Al₂O₃, FeO and MnO**. ESSB proposed to utilize the slag to be **recycled as alternative raw material** for the existing Sinter Plant as the slag still have elements that can be recovered.



EXISTING PLANT INFORMATION

The existing IISM has been developed and constructed in phases **since year 2010**, which comprise of **Iron Making Plant, Steel Making Plant, Forming and Finishing Mill** and other supporting facilities

IRON MAKING PLANT

Comprised of **Sinter Plant & Blast Furnace**



Within the **Sinter Plant**, raw materials are sintered into coarse-grained **iron ore sinter** which will be transferred into the Blast Furnace. The **Blast Furnace** is fed with the iron ore sinter, coke and small quantities of fluxes and heated in the furnace to produce, **pig iron** products.

STEEL MAKING PLANT

Comprised of **Steel Converter, Ladle Furnace & Continuous Caster**



In the **Steel Converter**, pig iron is refined with oxygen lower the carbon proportion & provide heat to maintain the **steel in liquid form**. The finished steel is transferred to a **Ladle Furnace** where they will be **further refined**. It will then be sent to a **Continuous Caster** to form **semi-finished steel products**.



PRINCIPAL PROJECT ACTIVITIES

The development of the Project involves the following three phases:



PRE-CONSTRUCTION

- Feasibility studies
- Detailed survey
- Soil investigation
- Detailed design
- Site preparation



CONSTRUCTION

- Mobilisation of construction workers, equipment and materials
- Piling and foundation works
- Construction of warehouse and production building
- Landscaping works



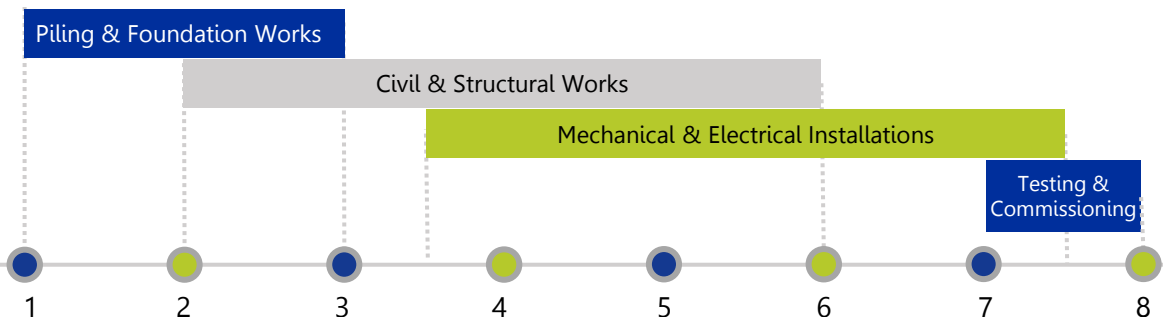
OPERATION

- Operation of the Project
- Waste management
- Maintenance of plant and equipment



PROJECT IMPLEMENTATION SCHEDULE

The construction of the Project for Phase 1 is expected to be **seven (7) months**. Phase 2 construction will have similar construction period as Phase 1 and will be implemented depending on the market demand

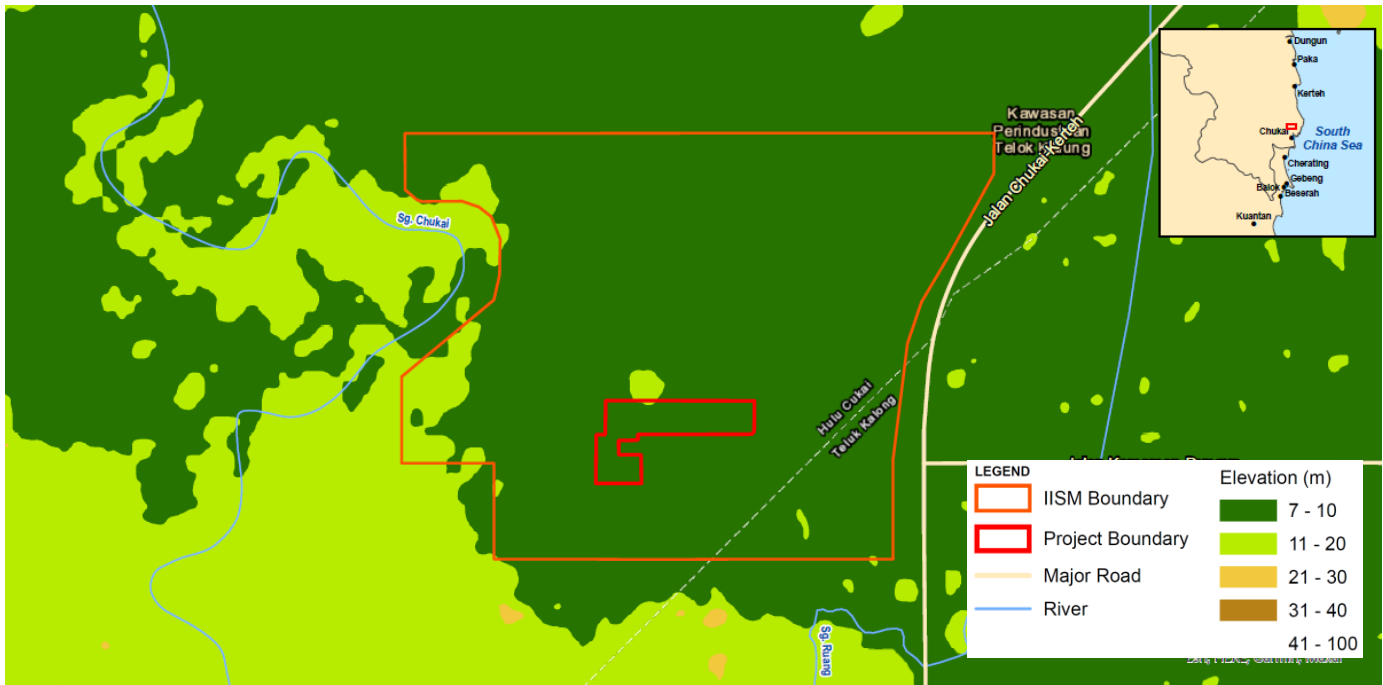


6 | EXISTING ENVIRONMENT

TOPOGRAPHY AND TERRAIN



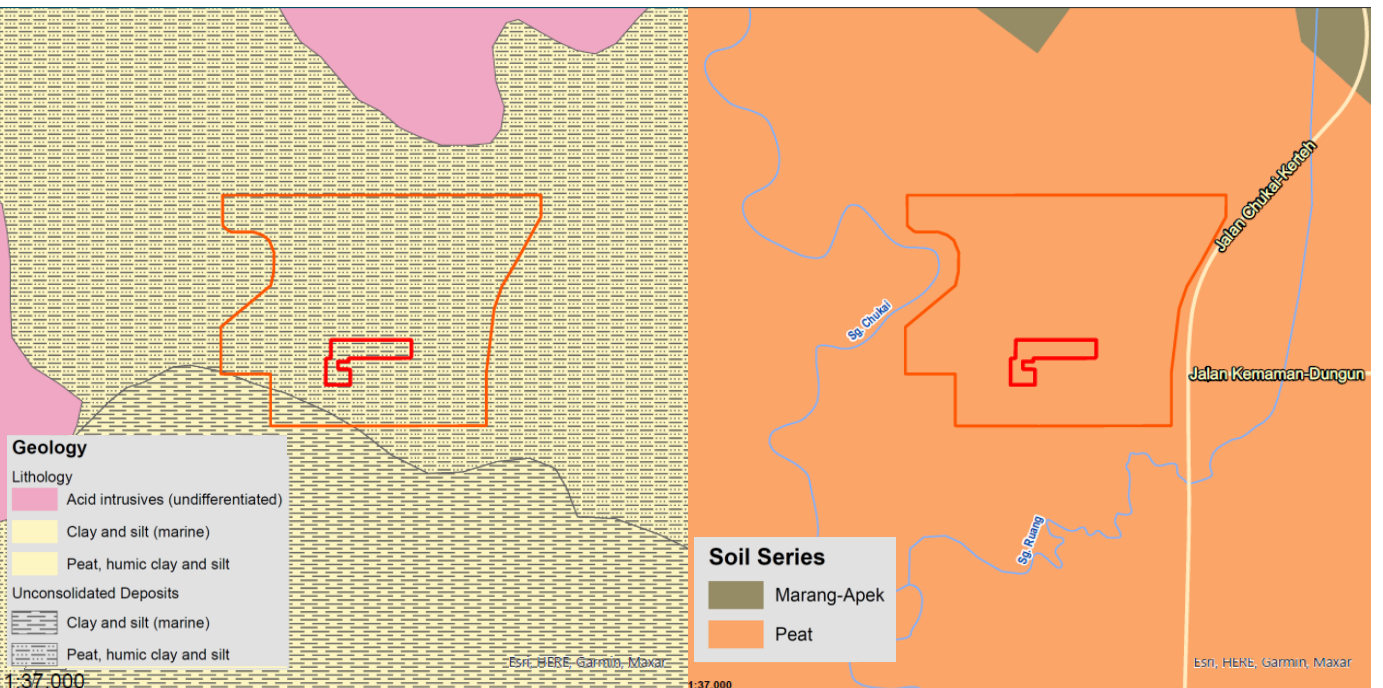
The original topography of the Project site was low lying and flat with an elevation of **lower than 20m**, as it was previously a swamland. The Project site has been levelled to its desired platform.



GEOLOGY AND SOIL



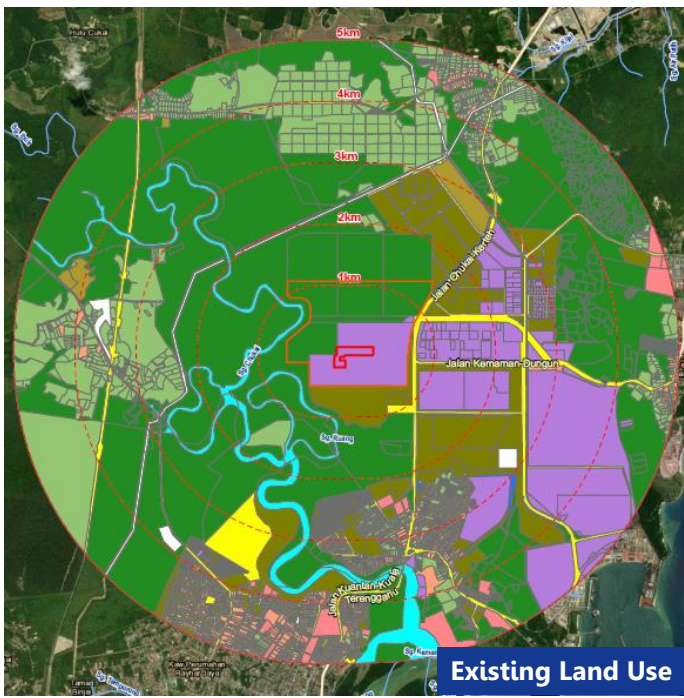
The Project site is underlain by predominantly unconsolidated sediment from the **Quaternary age**. The underlying soil composition of the Project site is characterized as **peat, humic clay and silt**.



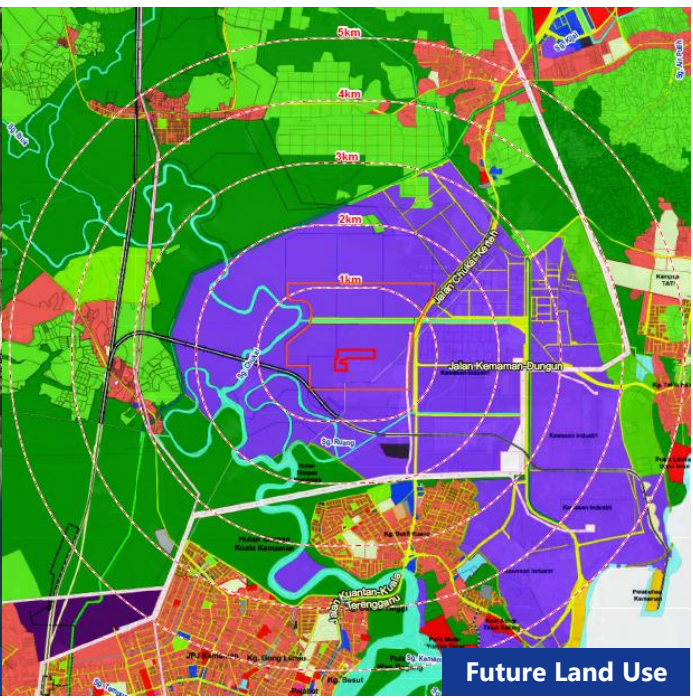


EXISTING AND FUTURE LAND USE WITHIN 5KM OF PROJECT SITE

Current land use of the Project site based on *Rancangan Tempatan Daerah Kemaman 2035* is **heavy industry**. Land use within 2km radius of the Project site have been gazetted as industrial areas. There is increase in land size area dedicated for industrial area at the northern and eastern segment 3 to 4km from the Project site.



Existing Land Use



Future Land Use

Legend		Land Use					
	IISM Boundary		Residential		Open Space and Recreational		Agriculture
	Project Boundary		Commercial		Vacant Land		Forest
	Distance Indicator		Industry		Transportation		Water Bodies
			Institutional and Public Amenities		Infrastructure and Utilities		

CLIMATE

General climate of Project site is similar to the rest of Peninsular Malaysia with **high annual rainfall and a relatively uniform high humidity and temperature**.

Temperature
The average annual 24-hour temperature recorded is **26.8°C**. Warmest month is May while coolest month is December.

Rainfall and Relative Humidity
The average annual rainfall recorded is **2,975.3 mm**. The average annual 24-hour mean relative humidity recorded is **84.8%**.

HYDROLOGY AND RIVER SYSTEM

The Project Site is located within the **Sg. Kemaman catchment** (2190 km²). The nearest river, **Sg. Teluk Kalung** extends 1.1km westward from Project site before reaching the confluence with Sg. Chukai. Sg. Chukai flows southward into Sg. Kemaman before discharging into the South China Sea.





ENVIRONMENTAL QUALITY

Baseline sampling was carried out at the following points and the results are summarized as below:



Water Quality

Six (6) samples in total were collected from the surrounding rivers. The water quality index (WQI) were within Class II of the National Water Quality Standards.



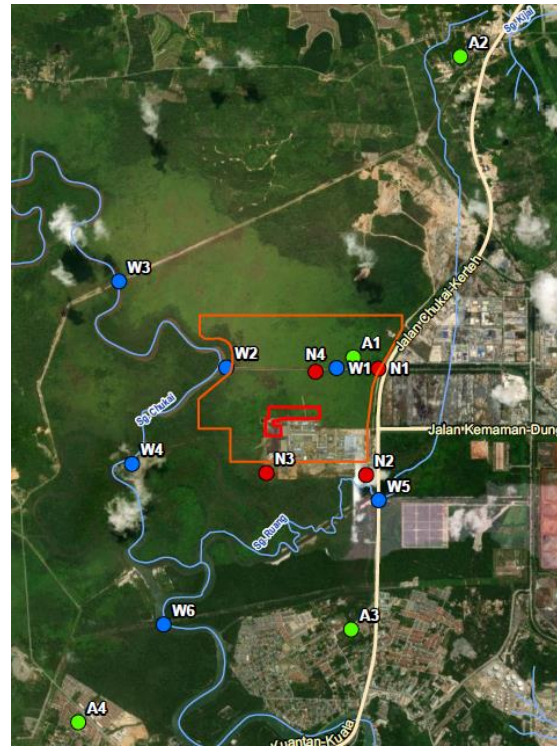
Ambient Air Quality

Four (4) locations were selected to carry out monitoring. All parameters are well below the stipulated limits in MAAQS and Ontario Ambient Air Quality Criteria.



Ambient Noise Level

Four (4) locations were selected to measure the ambient noise level. Noise levels during day-time and night-time is within the permissible limits as stipulated in Second Schedule from the Guidelines for Environmental Noise Limits and Control – Third Edition



WASTE MANAGEMENT

Waste management in Kemaman is under the jurisdiction of Majlis Perbandaran Kemaman (MPK). All domestic wastes in Kemaman, except from Kemasik to Kerteh, will be collected and disposed off at **Bukit Takar Landfill** (3.8km from Project site).

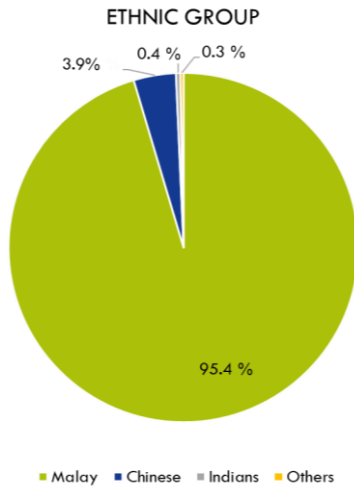
The average daily quantity of scheduled wastes generated and current management of scheduled wastes generated from the existing plant operation is summarized as follows:

No.	SW Code	Description	Estimated Quantity Generated (kg/day)	Current Management Method
1.	SW 306	Spent hydraulic oil	100.0	<ul style="list-style-type: none"> Recovery by licensed waste receiver, RHM Trading & Transport Services Sdn. Bhd . Disposed off-site at licensed waste receiver Pentas Flora (Kelantan) Sdn. Bhd.
2.	SW 311	Oily sludge	3.33	<ul style="list-style-type: none"> Recovery by licensed waste receiver Greenverse Sdn. Bhd.
3.	SW 409	Disposed containers	11.67	<ul style="list-style-type: none"> Recovery by licensed waste receiver, RHM Trading & Transport Services Sdn. Bhd. and Greenverse Sdn. Bhd. Some SW 409 were reused as road barrier.
4.	SW 410	Contaminated gloves	12.50	<ul style="list-style-type: none"> Disposed to prescribed premises
5.	SW 429	Discarded chemical	11.00	<ul style="list-style-type: none"> Recovery by licensed waste receiver Greenverse Sdn. Bhd.
Total			138.50	



SOCIOECONOMY

Settlements identified for this study are in Daerah Kemaman, Terengganu.



DAERAH KEMAMAN (as of 2019)



Total Population

212,000



Male

53.0%



Household

50,000



Female

47.1%



Mean Income

RM7,854

Source: My Local Stats Terengganu 2019 (Kemaman) published by Department of Statistic Malaysia



EXISTING PUBLIC HEALTH

Morbidity statistics on **diseases related to the environment** were obtained from **Klinik Kesihatan Kijal, Klinik Kesihatan Batu 2.5 & Hospital Kemaman** for a period of **1 year** from January to December 2020.



Disease Cases Related to:

Air Pollution

Eye and respiratory disease

Adult (4.6%) Children (4.3%)

Cardiovascular disease

Adult (2.2%)



Disease Cases Related to:

Water Pollution

Dysenteries, cholera & food poisoning

Adult (0.3%) Children (1.8%)



Disease Cases Related to:

Animal Vectors & Reservoirs

Dengue fever and malaria

Adult (1.4%) Children (0.7%)



Disease Cases Related to:

Skin Disease

Cutaneous abscess & carbuncle, cellulitis, dermatitis & eczema, psoriasis, urticarial disorder & erythema

Adult (0.2%) Children (0.1%)

7 & 8 | EVALUATION OF IMPACTS & MITIGATION MEASURES



PRE-CONSTRUCTION

- Project Planning & Site Investigation



CONSTRUCTION

- Water Quality
- Air Quality
- Noise
- Waste Management
- Socioeconomic Impact




















OPERATION

- Air Quality
- Health Impact
- Waste Management
- Water Quality
- Noise
- Quantitative Risk Assessment
- Socioeconomic Impact



CONSTRUCTION PHASE

Findings from the impact evaluation and mitigation measures for construction phase are summarized in a matrix format shown below:

 ENVIRONMENTAL ELEMENTS	 POTENTIAL IMPACTS	 IMPACT SIGNIFICANCE	 POLLUTION PREVENTION & MITIGATION MEASURES
 <p>Water Quality</p>	 <p>River water pollution due to surface runoff from exposed land, foundation & infrastructure works</p>  <p>Accidental spillage of hazardous materials (such as oil and grease and chemicals) from machinery & equipment</p>	<p>Low</p>	 <p>Soil Erosion & Sedimentation Surface runoff will be channelled into existing retention ponds within the IISM to ensure sedimentation of soil particles</p>  <p>Sewage Management Sewage discharge from existing toilet facilities within the IISM will be treated by septic tanks where maintenance shall be conducted regularly</p>  <p>Storage and Handling of Petroleum Products and Hazardous Material Immediate cleaning up of oil spills, proper storage of used oil and grease, and proper execution of ERP</p>
 <p>Air Quality</p>	 <p>Fugitive dust, including PM₁₀, generated from construction activities could potentially affect ambient air quality</p>  <p>Dust and gaseous emissions of PM₁₀, PM_{2.5}, CO, NO₂ and SO₂ from the combustion of fuel from vehicles, generators and other equipment could affect ambient air quality</p>	<p>Low</p>	 <p>Regular water spraying, and covering of stockpiles</p>  <p>Provision of wheel washing facility</p>  <p>Impose speed limits within site</p>  <p>Proper maintenance of construction vehicles and discourage idling</p>



CONSTRUCTION PHASE (CONT'D)



ENVIRONMENTAL ELEMENTS



POTENTIAL IMPACTS



IMPACT SIGNIFICANCE



POLLUTION PREVENTION & MITIGATION MEASURES



Waste Generation

Scheduled Waste

Potentially cause **soil and groundwater contamination** due to **leakage and seepage**, which will eventually pollute nearby waterways



Solid Waste

Localised flooding due to **blockage of drains and stream**



Breeding grounds for pests that will transmit diseases



Noise

Temporary increase in ambient noise level due to operation of heavy machinery & vehicles during piling works & building construction works



Scheduled Waste

Scheduled wastes should be managed according to the **Guidelines for Packaging, Labelling and Storage of Scheduled Wastes in Malaysia** published by DOE



Solid Waste

Recommended to be treated according to the **waste management hierarchy**: refuse, reduce, reuse, recycle, recover, then disposal



Specification and substitution of noisy equipment or activities



Modification of existing plant and equipment in accordance with the manufacturer's consultation



Enclosures of noisy machineries or activities










Use and siting of equipment



Regular and effective maintenance of machineries





CONSTRUCTION PHASE (CONT'D)

ENVIRONMENTAL ELEMENTS	POTENTIAL IMPACTS	IMPACT SIGNIFICANCE	POLLUTION PREVENTION & MITIGATION MEASURES
 <p>Socio-economy</p>	<p> Employment opportunities for local communities</p> <p> Public safety i.e., movement of trucks and construction machinery</p>	<p>Low</p>	<p> Appoint a Person-in-Charge (PIC) to ensure continuous communication with local communities</p> <p> Implement all environmental mitigation measures</p> <p> Ensure trucks carrying construction material & waste to comply with speed limit & covered with tarpaulin</p> <p> Workers quarters shall be built to include basic amenities & recreational facilities to reduce the need for workers to travel outside & reduce potential conflict with nearby residents</p>









PROJECT ABANDONMENT

In the event that the Project is abandoned, the following measures must be taken:







 <p>Submission of Project Abandonment Plan to DOE Terengganu prior to abandonment</p>	 <p>Construction wastes and domestic wastes must be disposed off at an approved landfill</p>	 <p>Scheduled wastes must be transported out from the site and managed adequately by DOE licensed contractors</p>
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OPERATION PHASE















Findings from the impact evaluation and mitigation measures for operation phase are summarized in a matrix format shown below:

 ENVIRONMENTAL ELEMENTS	 POTENTIAL IMPACTS	 IMPACT SIGNIFICANCE	 POLLUTION PREVENTION & MITIGATION MEASURES
 <p>Air Quality</p>	 <p>Emissions of particulate & gaseous pollutants from sintering machine and submerged arc furnace</p>	<p>Medium</p>	<p>Installation of Air Pollution Control (APC) systems such as electrostatic precipitator (ESP) and baghouse filter</p> <p>APC system shall be monitored in accordance with the DOE's Technical Guidance on Performance Monitoring of Air Pollution Control System</p> <p>Immediate investigation and rectification shall be conducted in the event of black/dark stack emissions</p> <p>Stack emission monitoring to ensure the emission comply with Environmental Quality (Clean Air) Regulation 2014</p>
 <p>Health</p>	 <p>Health risks to population residing in Project vicinity due to exposure to air pollutants generated from Project operation</p>	<p>Low</p>	<p>Workers quarters to be air-conditioned to avoid the entry of outdoor particulate pollutants into the indoor environment</p> <p>Periodical ambient air quality monitoring for PM_{2.5} at ESSB Workers Quarters</p> <p>Periodic inspection for mosquito breeding following MOH's Guidelines on Aedes Mosquito Control at Construction Sites</p>















OPERATION PHASE (CONT'D)

 ENVIRONMENTAL ELEMENTS	 POTENTIAL IMPACTS	 IMPACT SIGNIFICANCE	 POLLUTION PREVENTION & MITIGATION MEASURES
 <p>Waste Generation</p>	<p>Scheduled Waste Potentially causing soil and groundwater contamination due to leakage and seepage</p> <p>Solid Waste Decomposition of biodegradable wastes causing seepage of organic materials into the soil and eventually to nearby waterways</p> <p>Pest infestation of organic waste</p> <p>Localised flooding due to drainage blockage</p> <p>Odor and unsightly view to nearby receptors</p>	<p>Medium</p>	<p>Scheduled Waste Managed according to the Guidelines for Packaging, Labelling and Storage of Scheduled Wastes in Malaysia</p> <p>Utilisation of furnace slag into the existing plant operation</p> <p>Solid Waste Recommended to be treated according to the waste management hierarchy: refuse, reduce, reuse, recycle, recover, then disposal</p>
 <p>Water Quality</p>	<p>Domestic sewage generation from Sewage Treatment Plant (STP) and septic tanks within IISM</p> <p>Intermittent blowdown discharge from Blowdown Slag Tank</p>	<p>Medium</p>	<p>Compliance to effluent discharge limits as stipulated in the Environmental Quality (Sewage) Regulations 2009</p> <p>Regular maintenance of septic tanks</p> <p>In the event of emergency, industrial effluent or blowdown water to be stored in holding pond & treated to comply with Standard B limit of Environmental Quality (Industrial Effluent) Regulations 2009</p>

OPERATION PHASE (CONT'D)

 ENVIRONMENTAL ELEMENTS	 POTENTIAL IMPACTS	 IMPACT SIGNIFICANCE	 POLLUTION PREVENTION & MITIGATION MEASURES
 <p>Noise</p>	 <p>Increase in ambient noise levels from mechanical equipment noise such as pumps, blowers, air blowers, air compressors, mills, grinder etc.</p>	<p>Low</p>	<p>Recommended to abide by the hierarchy of noise control: elimination, substitution, engineering controls, administrative controls, then PPE</p> 
 <p>Quantitative Risk</p>	<p>Risk of fire and explosion from combustible element as well as storage of flammable liquid or substances</p> 	<p>Low</p>	<p>All pipeline shall strictly comply with appropriate design standards</p> <p> Reliability-based maintenance programme (RBM) shall be conducted for all equipment of the facilities</p> <p> Hazard and Operability study (HAZOP) for the ferroalloy plant shall be conducted</p> <p> Updated CIMAH to be submitted DOSH for approval</p> <p> Existing Emergency Response Plan (ERP) shall be updated to include new Project components</p> <p> Good coal pile management practices to prevent or minimize the likelihood of combustion</p>

OPERATION PHASE (CONT'D)

 ENVIRONMENTAL ELEMENTS	 POTENTIAL IMPACTS	 IMPACT SIGNIFICANCE	 POLLUTION PREVENTION & MITIGATION MEASURES
 Socio-economy	<ul style="list-style-type: none">  Increased traffic & road safety concern  Reduction of ambient air quality  Employment opportunities for local communities  Increase the number of high-skilled workers 	Low	<ul style="list-style-type: none">  Appoint a Person-in-Charge (PIC) to ensure continuous communication with local communities  Implement all environmental mitigation measures  Ensure trucks carrying raw material & products to comply with speed limit & covered with tarpaulin  Workers quarters shall be built to include basic amenities & recreational facilities to reduce the need for workers to travel outside & reduce potential conflict with nearby residents All workers shall be briefed on related Malaysian laws, customs and social etiquettes to help them become familiar with local norms  Prioritize or create a quota system where jobs to be made available to the locals

9 | ENVIRONMENTAL MANAGEMENT PLAN



Eastern Steel Sdn. Bhd. is responsible for effective implementation of mitigation measures and management of environmental quality on-site. EMP will be prepared and submitted to DOE Terengganu for approval.

PROPOSED MONITORING PROGRAMME & AUDITING (CONSTRUCTION PHASE)

Water Quality

Performance Monitoring – All P2M2 on-site

Compliance Monitoring – Discharge of retention ponds;
Discharge of temporary septic tank

Impact Monitoring – Four (4) proposed monitoring points (W1, W2, W4, W5)

Air Quality

Impact Monitoring – One (1) proposed monitoring point (A1)

Ambient Noise Level

Impact Monitoring – One (1) proposed monitoring point (N1)

Environmental Audit

To carry out **once every four months** within the Project site



PROPOSED MONITORING PROGRAMME & AUDITING (OPERATION PHASE)

Water Quality

Performance Monitoring – Wastewater treatment plant (WWTP); Sewage treatment plant (STP)

Compliance Monitoring – Discharge of sewage from STP

Impact Monitoring – Four (4) proposed monitoring points (W1, W2, W3, W4)

Air Quality

Compliance Monitoring – 15 proposed stacks within Project & 18 existing stacks within IISM

Impact Monitoring – Four (4) proposed monitoring points (A1, A2, A3, A4)

Ambient Noise Level

Impact Monitoring – Four (4) proposed monitoring points (N1, N2, N3, N4)

Environmental Audit

To carry out **annually** within the Project site



10 | STUDY FINDINGS



During construction stage, impact for **water quality, air quality, noise, waste generation & socioeconomy** is expected to be **low**.

As for operation stage, impact for **air quality, waste generation & water quality** is expected to be **medium**, whereas impact for **health, noise, quantitative risk & socioeconomy** are expected to be **low**.