



Environmental and Social Impact Assessment (ESIA)

ALBA PET Recycling Facility Tridi Phase 2

27 April 2023

Project No.: 0654443

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ALBA PET Recycling Facility Tridi Phase 2



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Acronyms and Abbreviations

Name	Description
AGA	ALBA Group Asia
AMDAL	<i>Analisis Mengenai Dampak Lingkungan</i> / Environmental Impact Analysis
Aol	Area of Influence
AR6	Sixth Assessment Report
BMKG	<i>Badan Meteorologi, Klimatologi, dan Geofisika</i> Meteorological, Climatological, and Geophysical Agency
BNPB	<i>Badan Nasional Penanggulangan Bencana</i> National Agency for Disaster Countermeasure
BPS	<i>Badan Pusat Statistik</i> / Central Bureau of Statistics
CAPEX	Capital Expenditure
CBAM	Carbon Border Adjustment Mechanism
CGO	Community Grievance Officer

CIA	Cumulative Impact Assessment
CLO	Community Liaison Officers
CSR	Corporate Social Responsibility
EAAA	Ecologically Appropriate Area of Analysis
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EMP	environmental management plan
EOO	Extent of Occurrence
ERP	Emergency Response Plan
ESDD	Environmental and Social Due Diligence
ESIA	Environmental And Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
FDA	Food and Drug Administration
GBV	gender-based violence
GHG	Green House Gas
GRM	Grievance Redress Mechanism
HDPE	High Density Polyethylene
HH	Household
HSE	Health, Safety, and Environment
IBAT	Integrated Biodiversity Assessment Tool
IEA	International Energy Agency
IFC PS	International Finance Corporation Performance Standards
IMS	Integrated Management System
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
IUCN	The International Union for Conservation of Nature and Natural Resources
JVCo2	Project-level Joint Venture with PT Tridi Oasis
KBAs	Key Biodiversity Areas
KIP	Kendal Industrial Park
LAPAN	National Institute of Aeronautics and Space
LDPE	Low-density polyethylene
MoEF	Ministry of Environment and Forest
NGO	Non-Governmental Organization
OHS MS	Occupational Health and Safety Management System
OPEX	Operational Expenditure
PET	Polyethylene terephthalate
PID	Project Information Document
PPE	Personal Protective Equipment
PVC	Polyvinyl chloride
RKL-RPL	<i>Rencana Pengelolaan Lingkungan Hidup - Rencana Pemantauan Lingkungan Hidup</i> Environmental Management Plan and Environmental Monitoring Plan
rPET	recycled PET
SEA	sexual exploitation and abuse
SEP	Stakeholder Engagement Plan
SLR	Sea Level Rise
SOP	Standard Operating Procedures
SPV	Special Purpose Vehicle

VEC valued environmental and social component
WBG The World Bank Group
WWTP Wastewater Treatment Plan

EXECUTIVE SUMMARY

ALBA Group Asia Limited (AGA) (hereafter refers as “ALBA”) together with its local partner, PT Tridi Oasis Group (hereafter refers as “Tridi”) has formed a joint venture Project Company (hereafter refers as “Special Purpose Vehicle”, “SPV”, or “Client”) called PT ALBA Tridi Plastic Recyclings to develop, construct and operate a plastic recycling facility that produces food-grade recycled PET (rPET) flakes and pellets.

The plastics recycling facility will be constructed in Kendal Industrial Park (KIP), Central Java, Indonesia (hereafter refers as ‘the Project’) and occupy an area of 25,669 sqm ~ 2.57 hectares. KIP is a joint venture between Sembcorp Development Ltd (Singapore) and PT Jababeka Tbk (Indonesia) with total development size of 2,200 hectares and was officially inaugurated on 16 November 2016. As such, the Project area only covers 0.12% of the whole of KIP.

The Project will source post-consumption PET bottles as input materials and produce rPET flakes and pellets through a complete mechanical recycling process, including cleaning, shredding, drying, extrusion and packing. The Project is expected to have a 2-year construction period before reaching the Commercial Operations Date (COD) in December 2024 with an operational lifetime of 18 years. The output rPET will be sold mainly to consumer food and beverage companies in Indonesia, other Asian countries and Europe. As per the report writing, the SPV has identified in total 22 suppliers of post-consumption PET bottles in Semarang and some nearby regencies.

It can be summarized from the ESIA that the environmental impact from the proposed Project can be mitigated therefore it is classified as **Category B** while the project will have minimal or no adverse social risks and/or impacts due to its location in industrial estate and can be classified as **Category C**. The classification is based on the fact that:

- The project site is located within KIP which obtained its revised Environmental Permit on 11 April 2017 through the issuance of Governor of Central Java Decree number. 660.1/11 Year 2017. The environmental and social impacts from the presence of the Industrial Estate have therefore already been assessed and that for the permitting of the project activities the SPV will need to develop Detail Environmental Management and Monitoring Plan (RKL – RPL *Rinci*) that alignment with the Estate’s RKL – RPL document to address environment and social impact of the project;
- The project site is neither situated in the vicinity nor in the boundary with residential areas or other sensitive receptors;
- The project site is not located in the close proximity with any critical habitat, key biodiversity area, or biodiversity hotspot. The area within KIP is considered modified habitat where the project site was previously a shrimp pond;
- With respect to the land acquisition of the project site the HGU (*Hak Guna Usaha* - Business Utilization Right) certificate has been completed and there have been no identified complaints from the past voluntary land acquisition;
- To reduce dust content concentration in emissions generated from extrusion process, an additional filtering system with HEPA technology will be installed. HEPA technology uses a dense layer of fine mesh fibers to remove airborne contaminants from the air through mechanical filtration, thereby lowering the dust content and other emissions. Acetaldehyde, Limonene, Benzene, and Toluene are the typical volatile organic compounds (VOCs) that are emitted from the production process of recycled polyethylene terephthalate (rPET). In order to mitigate potential VOC emission ie. Acetaldehyde, Limonene, Benzene, and Toluene from the extrusion/SSP plant exhaust., activated carbon filters will be installed to mitigate any potential VOC emissions.
- The project site will develop and operate site wastewater treatment plant to treat wastewater generated from domestic activities (black and grey water) and operational activities to meet

the Estate’s wastewater quality standard prior to being treated further in the Estate’s wastewater treatment plant. Due to the absence of microplastic parameter in the KIP’s effluent standard for its tenant, the Project company will carry out microplastic analysis in their treated wastewater prior to channeling it to KIP WWTP and compare the result with microplastic concentration in the clean water supply from KIP;

- Other environmental impact potentially generated from the Project activities ie. noise, liquid and solid waste (non-hazardous and hazardous) will be managed in accordance with the ESMP in this ESIA and also with Detail RKL – RPL document for the Project activities;
- The presence and operations of KIP is expected to provide work opportunity for the surrounding community and the Kendal regency. KIP has been in collaboration with the Kendal Regency and Ministry of Industry create Link or Match Program that connects vocational and industry within a framework that includes curriculum alignment. Up to May 2022, the Link and Match Program has successfully conducted training for 300 workers.

Summary of degree of impact significance during pre-construction, construction, and operational phase is shown below.

Summary of Degree of Impact Significance

No	Impact	Pre- Construction and Construction	Operation
1.	Land Acquisition	Minor	Not scoped into assessment
2.	Economic Displacement	Minor	Not scoped into assessment
3.	Economic Opportunities	Minor	Not scoped into assessment
4.	Land Clearing and Reclamation	Minor	Not scoped into assessment
5.	Land Use	Minor	Not scoped into assessment
6.	Soil and Groundwater	Not scoped into assessment	Minor
7.	Water Management	Minor	Minor
8.	Traffic Management	Minor	Not scoped into assessment
9.	Ambient Air Quality	Minor	Not scoped into assessment
10.	Air Emission	Not scoped into assessment	Moderate
11.	Odour	Not scoped into assessment	Minor
12.	Waste Management	Minor	Minor
13.	Occupational Health and Safety	Moderate	Moderate
14.	Community Health and Safety	Minor	Minor

No	Impact	Pre- Construction and Construction	Operation
15.	Third Party Supplier Occupational Health and Safety	Not scoped into assessment	Major
16.	Employment	Minor	Minor
17.	Energy	Minor	Not scoped into assessment
18.	Noise	Minor	Minor
19.	Scattered Plastic Bottle	Not scoped into assessment	Minor
20.	Climate Change	Moderate	Moderate

Chapter 8 Environmental And Social Management Plan in the Report details the environmental and social management measures required during the construction and operation of the Project.

1. INTRODUCTION

ALBA Group Asia Limited (hereafter refers as “ALBA”) together with its local partner, PT Tridi Oasis Group (hereafter refers “Tridi”) has formed a joint venture Project Company (“Special Purpose Vehicle”, “SPV”, or “Client”) called PT ALBA Tridi Plastic Recyclings to develop, construct and operate a plastic recycling facility that produces food-grade recycled PET (rPET) flakes and pellets.

The facility will be constructed in Kendal Industrial Park (KIP), Central Java, Indonesia (hereafter refers as ‘the Project’). The Project is expected to have a 2-year construction period before reaching the Commercial Operations Date (COD) in December 2024 with an operational lifetime of 18 years. The Project will source post-consumption PET bottles as input materials through a complete mechanical recycling process including cleaning, shredding, drying, extrusion, and packing. These input materials will be sourced from plastic suppliers that have been pre-selected by Tridi. The output rPET will be sold mainly to consumer food and beverage companies in Indonesia, other Asian countries, and Europe.

1.1 Project Proponent

ALBA was founded in 1968 in Germany and has grown into a leading waste management company in Europe. It is a family-run business, currently jointly owned and managed by Axel Schweitzer and Eric Schweitzer. Globally, the ALBA Group operates more than 250 facilities with EUR 2 billion turnover and 8,000 employees. ALBA Group Asia has four main business segments including hazardous waste, bio waste, plastic recycling, and smart city solutions. ALBA has more than 20 years of experience in Asia. ALBA Group Asia represents the brand ALBA in Asia with its headquarters in Hong Kong, SAR and operates facilities in China, Indonesia, and Singapore. ALBA currently has 11 projects in operation, 3 projects under construction, and 19 projects in the pipeline.

PT Tridi Oasis Group is a homegrown Indonesian recycling company aiming to turn problems in waste management into opportunities through recycling locally sourced plastic waste into high quality raw materials¹. They developed and operated a plant recycling locally sourced post-consumer PET such as plastic bottles into textile-grade rPET flakes with a capacity of 12,000 tons per annum. The company was established in 2016 with the aim to address a gap in Indonesia’s waste management system particularly in managing large amount of plastic waste. Their business is focused on recycling PET (polyethylene terephthalate) such as plastic bottles into a wide range of high-quality recycled PET flakes, which can be transformed into sustainable packaging and textiles, enabling customers to develop products that perform, look, and feel better. Alba provides the process and operational expertise, while Tridi Oasis provides the local network and collection. An existing facility, Tridi 1, is operating with a smaller capacity in Tangerang, Western Java.

1.2 Limitations and Assumptions

ERM cannot guarantee that the ESIA activities yielded complete information. To the extent that the services require judgement, there can be no assurance that fully definitive or desired results are obtained, or if any results are obtained, that they are supportive of any given course of action. The services may include the application of judgement to scientific principles, to that extent; certain results of this work may also be based on subjective interpretation.

The Client agrees that none of its advertising, sales promotion, or other publicity matter containing information obtained from these analyses and reports will refer to ERM’s trade name without ERM’s written approval. The information to be provided in this report is not to be construed as legal advice.

¹ <http://www.tridi-oasis.com/about>.

1.3 Report Structure

This ESIA report is structured as below:

- Section 1: Introduction;
- Section 2: Policy, Legal and Institution Framework
- Section 3: Project Description and Alternative Selection
- Section 4: Environmental and Social Baseline;
- Section 5: Stakeholder Engagement
- Section 6: Impact Assessment and Project Category
- Section 7: Cumulative Impact Assessment
- Section 8: Environmental and Social Management Plan
- Section 9: Conclusion and Recommendation

POLICY, LEGAL AND INSTITUTION FRAMEWORK/ APPLICABLE FRAMEWORK AND REGULATIONS

This section of the report details the relevant legislation and standards for the Project, covering national requirements as well as applicable international conventions and standards, and internal guidelines and standards.

2.1 National Applicable Regulation

The national applicable law and regulations as applied to this assessment are presented in detail in **Appendix C**.

2.2 The IFC Performance Standards

The IFC Performance Standards are international guidelines for identifying and managing environmental and social risks and has been adopted by several organizations as a key component of their environmental and social risk management. Project Company, as a subsidiary of ALBA Group Asia, is required to abide by the IFC performance standards. The eight (8) IFC Performance Standards are outlined below:

- Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts;
- Performance Standard 2: Labour and Working Conditions;
- Performance Standard 3: Resource Efficiency and Pollution Prevention;
- Performance Standard 4: Community Health, Safety, and Security;
- Performance Standard 5: Land Acquisition and Involuntary Resettlement;
- Performance Standard 6: Biodiversity conservation and Sustainable Management of Living Natural Resources;
- Performance Standard 7: Indigenous Peoples; and
- Performance Standard 8: Cultural Heritage.

2.3 The World Bank Group (WBG) Environmental Health and Safety (EHS) Guidelines

The World Bank Group (WBG) Environmental Health and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP), as defined in IFC's Performance Standards.

The EHS Guidelines contain the performance levels and measures that are normally acceptable to IFC and that are generally considered achievable in new facilities at reasonable costs by existing technology. Application of the EHS Guidelines to existing facilities may involve the establishment of site-specific targets with an appropriate timetable for achieving them. The environmental assessment process may recommend alternative (higher or lower) levels of measures, which, if acceptable to the lenders, become project or site-specific requirements.

PROJECT DESCRIPTION AND ALTERNATIVE SELECTION

3.1 Project Site

The total area of the Project is 25,669 sqm ~ 2.57 hectares, located in KIP where KIP is a joint venture between Sembcorp Development Ltd (Singapore) and PT Jababeka Tbk (Indonesia). KIP has a total development size of 2,200 hectares and was officially inaugurated on 16 November 2016. The Industrial Park obtained its revised Environmental Permit on 11 April 2017 through the issuance of Governor of Central Java Decree number 660.1/11 Year 2017.

Later, KIP is classified as Special Economic Zone since December 2019 through the issuance of Government Regulation no. 85 of 2019. KIP has built infrastructure facilities for their tenant industrial operators including all essential utilities such as clean water supply, electricity, wastewater treatment plant, and solid waste management.

KIP is located adjacent to the shoreline of Java Sea. **Figure 3-1** shows KIP and the Project area within KIP while **Figure 3-2** presents the Project area with more detailed information.



Figure 3.1 Project Location and Facilities

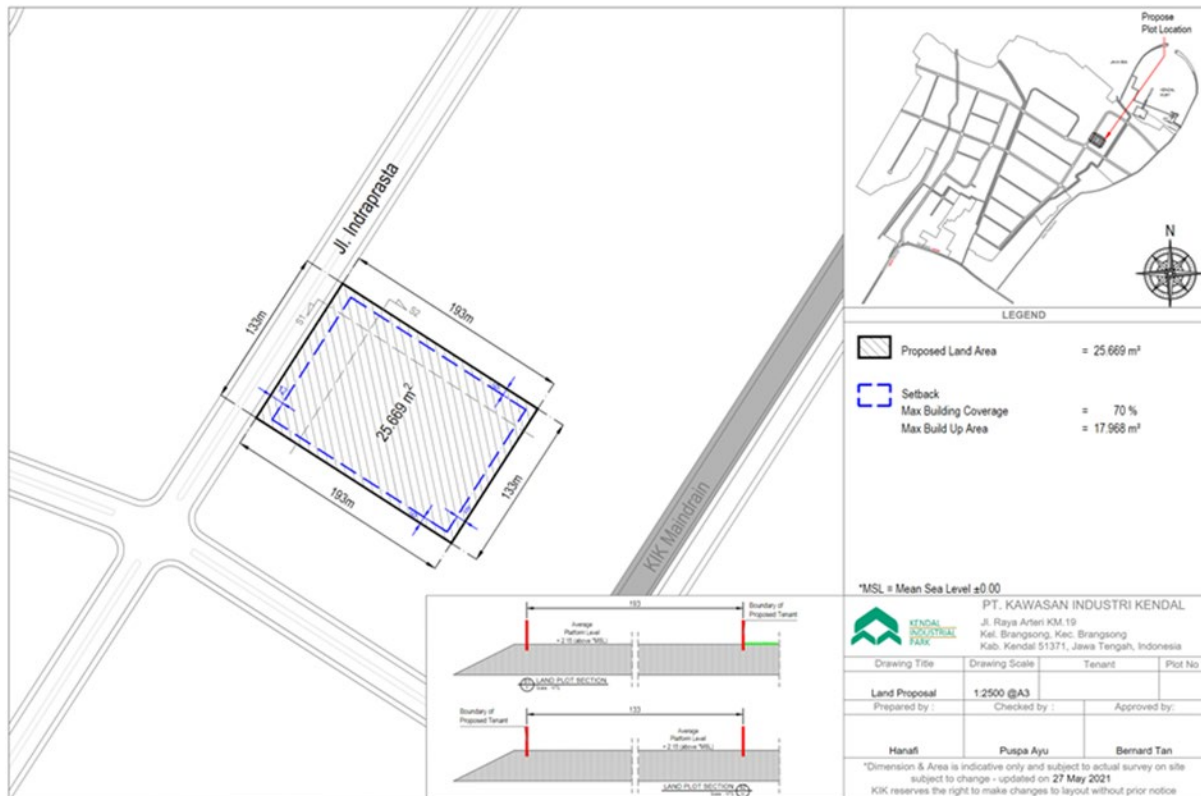


Figure 3.2 Land Plot of ALBA Project in KIP

The adjoining properties and nearby land use is detailed below:

- **Northeast:** An unnamed pond - based on the observation and interview during site visit in December 2022, the pond is utilized for fishing and shrimp cultivation by local community.
- **Southeast:** PT BSN Technologies Indonesia – footwear, apparel, bags, furniture, cosmetics, and accessories manufacturer
- **Southwest:** PT Solunova Alami Indonesia – manufacturing site that focuses on developing natural-based ingredients and flavour products for the tobacco and biopesticide industry.
- **West:** Access road of KIP

KIP facilities include the provision of all key utilities including:

- Clean water supply - currently, KIP uses groundwater to provide clean water to the tenants. However, KIP has also begun developing a water treatment centre that will source water from the Blorong river with 200 liter/second intake capacity;
- Power / electricity;
- Wastewater treatment plant; and
- Integrated waste management system – KIP collaborates with local provider to manage waste from its tenant.

In relation to land rights, the yellow box in **Figure 3-1** represents land that is still in the progress of acquisition. In general, some of the land inside KIP is still undeveloped (in form of pond which previously was fish/shrimp farm) and is occasionally used by the locals for recreational fishing. The Project area previously was also a fish pond but during recent site visit in December 2022, the area has been reclaimed.

3.2 Project Objective

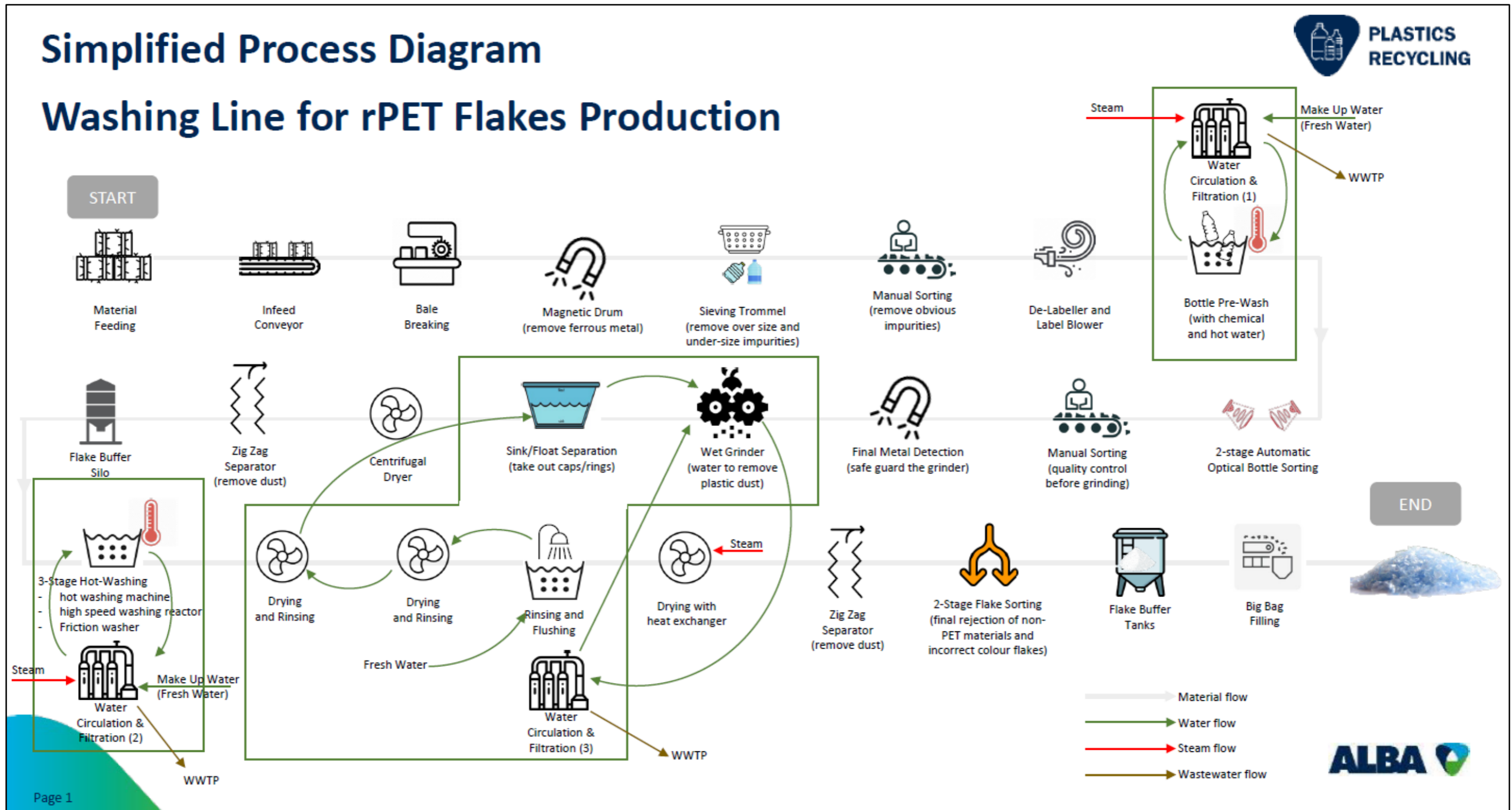
The Project is expected to have a 2-year construction period before reaching the Commercial Operations Date (COD) in December 2024 and will have an operational lifetime of 18 years. The Project will source post-consumption PET bottles as input materials and produce rPET flakes and pellets through a complete mechanical recycling process, including cleaning, shredding, drying, extrusion, and packing. The output rPET will be sold mainly to consumer food and beverage companies in Indonesia, other Asian countries, and Europe.

As per the report writing, the SPV has identified 22 suppliers of post-consumption PET bottles in Semarang and some nearby regencies.

In the Project Description Document for PT ALBA Tridi Plastics Recycling Project at Kendal Industrial Park (document Version 1 dated 13 October 2022), the Project's objectives are set as:

- To produce high quality rPET flakes, and food grade (FDA approved) rPET pellets;
- To establish a sourcing network in Kendal area and Central Java for bales PET bottles .
- To develop sales channel for domestic consumptions as well as exports to Asian and European countries; and
- To implement the project in full compliance with IFC environmental and social management requirements.

The flow of the PET recycling process to generate flake and pellet is presented in **Figure 3-3** and **Figure 3.4**.



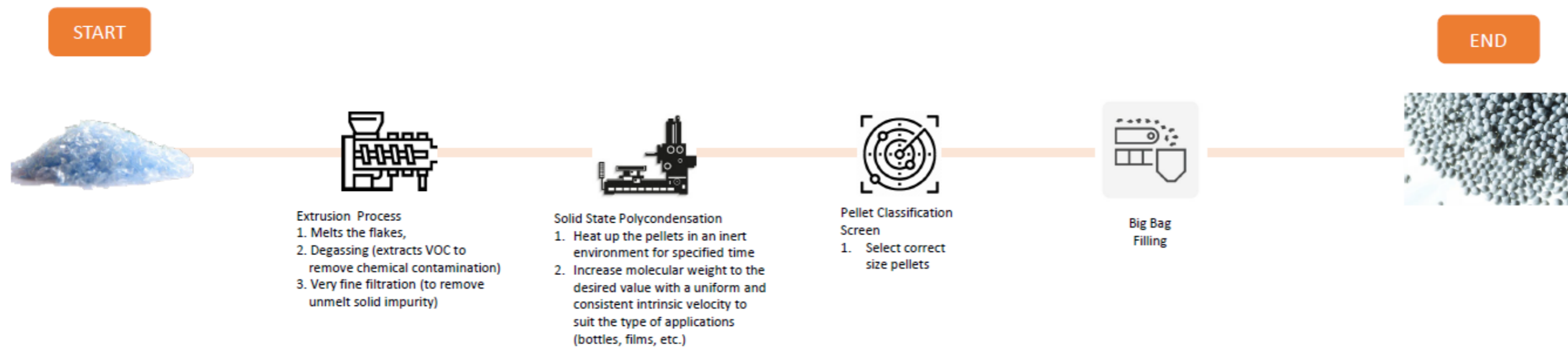
Source: ALBA, 2023

Figure 3.3 Simplified Process Diagram: Washing Line for rPET Flakes Production



Simplified Process Diagram

Extruder and Solid-State Polycondensation



Source: ALBA, 2023

Figure 3.4 Simplified Process Diagram: Extruder and Solid-State Polycondensation

3.3 Project Components

Project components are detailed below:

3.3.1 Feedstock for the Factory

The bale specification are as follows:

1. Total PET bottle fraction by weight = 85% or above. PET bottle fraction” refers to the total weight of clear/light blue PET bottles in a PET bale, inclusive of caps, rings and labels when they are still attached to the bottles, as a percentage of the total weight of that bale;
2. Transparent light blue bottles in the PET bottle fraction are allowed but shall not be more than 5% by weight;
3. Allowable contaminants at low levels: Total contaminants should not exceed 15% by weight; with no more than 2% of any of those listed below:
 - a. Clear PET (#1) Thermoformed Plastic (e.g., clamshells, bakery trays, covers, deli containers, drink cups)
 - b. HDPE (#2), LDPE (#4), PP (#5) rigid packaging,
 - c. Aluminium cans
 - d. Loose paper or cardboard (OCC)
 - e. Liquid residues
4. Contaminants NOT ALLOWED:
 - a. PVC (#3) in any form;
 - b. Chemically incompatible or low temperature melting materials, including PS (#6), PETG, and PLA, as rigid or foam in any product;
 - c. Any #7 plastics, including polycarbonate bottles;
 - d. Any non-packaging products;
 - e. Any bulky rigid plastics;
 - f. Any plastic bags or plastic film;
 - g. Any plastic foam;
 - h. Any Item containing degradable additives;
 - i. Containers which held hazardous materials, such as flammable, corrosive or reactive oligomers products;
 - j. Pesticides or herbicides, including motor oil bottles;
 - k. Other metal, wood, glass;
 - l. Batteries - Bio-medical waste items (e.g., syringes, sharps, gloves, masks);
 - m. Rocks, stones, mud, oils and grease

3.3.2 Choice of Recycling Technologies

The current state-of-the art bottle to bottle recycling technologies consist of two main parts:

1. PET Washing plant

The plant turns the post-consumer bottles into uniform size PET flakes with a series of automated and manual bottle sorting, delabelling, caps and rings separation, hot washing, friction washing, rinsing and flake sorting. The output is super clean, super pure PET flakes.

2. Extrusion and SSP Plant

The plant turns flakes to pellets. During the extrusion process, the flake is melt-filtrated to remove non-melt solid contaminants; and degassed to remove vapour (water, organic solvents, monomer, oligomers) and pigment particles or solidified melts; while the solid-state polycondensation process increases the viscosity of PET pellets, and further decontaminate and reduce amount of acetaldehyde and other VOC done by the high-vacuum degassing extruder. The high vacuum applied is applied to the extruder barrel. This creates a low-pressure environment inside the barrel, which causes the volatile substances in the polymer to evaporate and be removed from the melt. Therefore, the product is a crystalline pellet with virgin resin characteristics. Prior being discharged into the ambient air, the exhaust from the extrusion process, which includes Acetaldehyde, Limonene, Benzene, and Toluene, passes through an activated carbon filter to ensure that emissions have a lower VOC concentration to meet local regulation as well as Good International Industry Practice (GIIP).

ALBA has selected Boretech from China to supply the washing plant for the Project due to their strong track record of proving such systems in Southeast Asia countries. As for the extrusion and SSP Plant, ALBA has chosen Starlinger from Austria to be their supplier due to their cost effectiveness and with service centre / offices in Thailand and Indonesia.

3.4 Project Operational Description

3.4.1 Energy Consumption

Based on the provided operational data of the Project, the PET Washing Plant, SSP and Extrusion Plant and other operational activities will consume energy as shown in **Table 3-3**.

Table 3.3 Energy Requirements for the Project Operation

Phase	Description	Annual (Kwh)
1	Bottle to flakes	8,676,000
2	Flakes to pellets	6,278,000
3	WWTP (60HP x 746 W/HP x 80% X 24 hari x 365 day)	313,678
4	Air Compressor (90kW x 2 x 70% x 8256 hours)	1,040,256
5	Buildings	2,000,000
Total		18,307,934

Source: ALBA, 2023

The source of power will be provided by PLN (*Perusahaan Listrik Negara* – National Electricity Company). 700KVA diesel back-up generators will be built on the Project site for emergency power supply. Additionally, the Project will use natural gas for its boiler.

3.4.2 Water Usage and Discharge

Information on the Project operation provided by ALBA showed that the Project’s operation will require water supply from KIP in the volume of 202 m³/day. Of the supplied water, about 6% will be used for domestic use while the remaining 94% will be for processing activities. Based on the design, the facility is estimated to produce 15 m³/hour of sewage water and 4 m³/hour of oil chemical sewage. The project will build onsite wastewater treatment plant which will operate 24 hours a day. The plant will be designed to have flow rate of 20 m³/h, with specific allocation of 16 m³/h for Wash WW, 4 m³/h for Oily WW, and 48 m³/week for Chemical WW. The plant’s maximum capacity will be 20.3 m³/h, ensuring that it can handle any potential surges in wastewater flow. The wastewater generated from the domestic and plant’s activities will be treated on the Project site to meet KIP’s quality standard (shown in **Table 3-4**) prior to being channeled to KIP’s central WWTP. The onsite ALBA WWTP will produce oily sludge 18kg/day, oily sludge cake 150kg/day ordinary sludge 72kg/day, and ordinary sludge cake 480Kg/day.

The proposed technology for the Project’s onsite wastewater treatment plant is a biological treatment system that utilizes both anaerobic and aerobic processes. The anaerobic process will use a UASB reactor, while the aerobic process will use an Activated sludge system. The sludge resulting from the system will be processed through a sludge dehydrator, producing sludge cake. Additionally, an MBR will be used for the final stage to produce recovered water. The Project’s onsite WWTP is designed to provide up to 30% of the treated water to be re-used and the remaining being sent to KIP’s central WWTP. Water balance during operation stage is shown in **Figure 3.7**

Table 3.4 Effluent Quality of ALBA WWTP

No	Parameter	Unit	KIP Estate Regulation 2021	Effluent of ALBA WWTP*	Recovered Water ²
1.	pH		6.0 – 9.0	6.0 – 9.0	6.0 – 9.0
2.	Total Dissolved Solid / TDS	mg/l	2,000	2,000	
3.	Total Suspended Solid / TSS	Mg/l	400 / 30*	400	20
4.	BOD (Biological Oxygen Demand)	Mg/l	300/ 35*	300	255
5.	COD (Chemical Oxygen Demand)	Mg/l	500	500	150
6.	Oil and grease	Mg/l	15/ 3*	15	15

*: more constraint for textile industry

The KIP's WWTP will treat wastewater channeled from tenants within KIP using biological treatment through activated sludge technology to ensure that the effluent wastewater meets the threshold set for industrial park wastewater effluent, as stipulated by Central Java Province Regulation No. 5 of 2012 which is listed in **Table 3.5**.

Table 3.5 KIP Wastewater standard for its tenant and Central WWTP

No	Parameter	Unit	KIP Estate Regulation 2021**	KIP WWTP Effluent Standard***
A. Physical Parameter				
1.	Temperature	Centigrade	40	-
2.	Total Dissolved Solid / TDS	mg/l	2,000	-
3.	Total Suspended Solid / TSS	Mg/l	400 / 30*	150
4.	Colour	Pt.Co.Scale	200*	-
B. Chemical Parameter				
5.	pH		6.0 – 9.0	6.0 – 9.0
6.	Total Ammonia (NH ₃ -N)	Mg/l	10/ 8*	20
7.	Fe (Iron)	Mg/l	10	-
8.	Mn (Mangan)	Mg/l	5	-
9.	Hg (total Mercury)	Mg/l	0.005	-
10.	Barium (Ba)	Mg/l	3	-
11.	Cu (Copper)	Mg/l	2	2
12.	Zn (Zinc)	Mg/l	10	10
13.	Cr ⁺⁶ (Hexachrome)	Mg/l	0.5	0.5
14.	Cr (total Chrome)	Mg/l	1	1
15.	Cd (Cadmium)	Mg/l	0.1	0.1

² Basic Design for ALBA Wastewater Treatment Plant (WWTP) Indonesia, 2023

No	Parameter	Unit	KIP Estate Regulation 2021**	KIP WWTP Effluent Standard***
16.	Pb (Lead)	Mg/l	1	1
17.	Sn (Tin)	Mg/l	3	-
18.	As (Arsenic)	Mg/l	0.5	-
19.	Se (Selenium)	Mg/l	0.5	-
20.	Ni (Nickel)	Mg/l	0.5	0.5
21.	Co (Cobalt)	Mg/l	0.6	-
22.	CN (Cyanide)	Mg/l	0.5	-
23.	S (Sulphide), H ₂ S (Hydrogen Sulphide)	Mg/l	1.0/ 0.3*	1
24.	F (Fluoride)	Mg/l	3	-
25.	Cl ₂ (gas chlorine)	Mg/l	2	-
26.	NO ₃ -N (Nitrate)	Mg/l	30	-
27.	NO ₂ -N (Nitrite)	Mg/l	3	-
28.	BOD (Biological Oxygen Demand)	Mg/l	300/ 35*	50
29.	COD (Chemical Oxygen Demand)	Mg/l	500	100
30.	Surfactant Methylene Blue Active	Mg/l	5	-
31.	Phenol	Mg/l	1.0/ 0.5*	1
32.	MBAS	Mg/l	10	10
33.	Oil and grease	Mg/l	15/ 3*	15
34.	Maximum wastewater quantity		0.8 liter/second per ha of area	0.8 liter/second per ha of area

*: more constraint for textile industry

** : wastewater standard for its tenant

***: Based on the Central Java Province Regulation No. 5 of 2012 on Wastewater Quality Standard

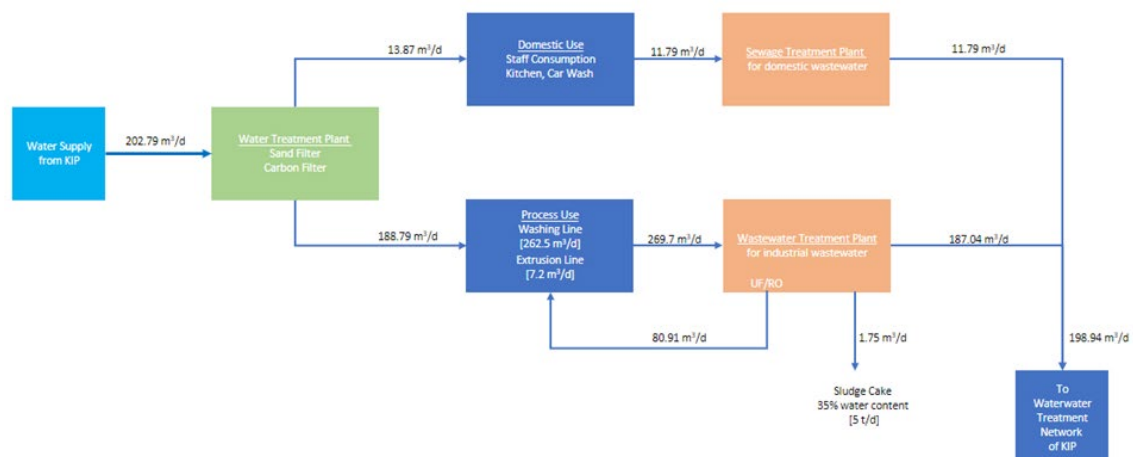


Figure 3.7 Water balance during Project Operation Stage

3.4.3 Solid waste

The plastic residue from PET washing process will be turned into plastic flakes and pellets. The washing plant will produce solid waste as shown in **Table 3.6** which considered as non-hazardous waste. The processing of flakes into pellet will be carried out in fully enclosed extrusion building. A mesh will be installed on all floor drains to prevent plastic residue from entering the drain system. Solid waste also will be generated from the manual bottle sorting, de-labelling and cap – ring separation in Washing Plant and also from the removal of non-melt solid contaminant in Extrusion and SPP Plant. The non-hazardous solid waste will be managed by KIP management through their waste vendor.

Table 3.6 Solid Waste Mass Balance from Washing Line

Derived from the Washing Line mass balance:

Type of waste	kg/hr	kg/d	Management
Ferrous Metal and Other Metal	12.0	252.0	Sell
PE+PP	319.0	6,699.0	Sell
General impurities	977.2	2,0521.2	Waste management by by KIP
Plastic flakes, impurities, dust	15.0	315.0	Sell
Sediment and fines	103.0	2,163.0	Waste management by KIP

Hazardous waste such as used oil will be generated from machinery maintenance in low volumes where it will be stored in the designated temporary storage for hazardous waste provided onsite prior to being handed over to a licensed third party for further processing. The non-hazardous waste will be collected and managed by KIP management through a contracted waste management service provider.

3.4.4 Noise

The operation of machinery in the washing plant as well as extrusion and SPP plant will generate indoor noise with detail as follow:

- In the Bale Storage Area, minimal noise emissions are generated from the 2 to 3 electric forklift trucks working there;
- In the Process Building, a noise enclosure will be provided for noisy equipment such as grinders and when all equipment is in operation, the typical noise level could be around 90 dB(A);
- The Extrusion Building has no noisy equipment, and the typical noise level inside the building could be approximately 85 dB(A).

It is noted from the Project design that the indoor noise would approximately reach 85dB, which meet the maximum allowable indoor noise level for occupational health from 8 working hours per day. Noise monitoring will be undertaken within the facility and for any identified high noise areas workers will be provided with appropriate PPE. It is also noted that the building structure will be designed to keep the outdoor noise level to be less than 70dB to meet the noise level for industrial area as per the applicable regulation.

3.4.5 Air Pollutant and Emission

It is understood from the Project description that PET flakes will be melted during the extrusion using Starlinger's PET recycling process to make it into pellets. Starlinger's PET recycling process is designed to be dust-free, with minimal material rotation and mixing. Utilizing the First In, First Out (FIFO) principle, the Hot Air Dryer (HAD) and Process Drying Unit (PDU) dryers have slow-moving agitator arms to prevent PET fines creation. The PDU operates on a closed-loop system, efficiently removing hygroscopic moisture and other impurities like volatile compounds. The High-vacuum degassing extruder will extract the VOC contamination embedded in the rPET. The process will result in hot air where concentration of contaminants of this airstream will be at <5 mg/Nm³ for dust and <15 mg/Nm³ for VOC. To reduce the dust content of emissions, an additional filtering system with HEPA technology will be installed. The activated carbon filters also are considered to be installed to mitigate any potential VOC emissions from the Extrusion and SSP plant exhaust.

KIP have provided internal regulation that limits the combustion level to align with the national standards i.e. MoEF No. 11/2021 regarding Emissions Quality Standards for internal combustion Generators and MoEF No. 7/2007 on Emissions Quality Standards (Boilers). As the project will use natural gas for the boiler, the threshold applied for the boiler emissions will be the threshold for boilers with gas fuel. The project will install 700KVA diesel backup generators for the emergency power supply. Thus, the threshold applied for the generators will be for those with a capacity of 501-1,000 KW. The emission threshold applied for the project is summarized in **Table 3.7**.

Table 3.7 Emission Threshold Applied for the Project

Parameter	Generator Emission *	Boiler Emission**
SO ₂	160 mg/Nm ³	150 mg/m ³
NOx	1,850 mg/Nm ³	150 mg/m ³
Total Particulate	95 mg/Nm ³	-
CO	77 mg/Nm ³	-

Notes:

* MoEF Regulation No. 11 of 2021 on Emissions Quality Standards For Internal Combustion Engines

**MoEF Regulation No. 7 of 2007 on Emission Standards For Non-Moving Sources For Steam Boilers

3.5 ANALYSIS OF ALTERNATIVES

This section examines alternatives to the proposed project site, technology, design, and operation.

This section provides description of alternatives that could be considered for this Project, outlining potential social and environmental impacts. The alternatives considered include:

- No-Project Option.
- Selection of Project location; and
- Project design and operation.

3.5.1 'No-Project' Option

The 'No-Project' option refers to the option whereby no recycling management facility is developed.

Desktop review has indicated that Indonesia currently has a 7% recycling rate for plastic, though specific types such as PET bottles are recycled at nearly 70%³. The development of the Client's PET recycling facility would support Kendal Regency in their aim to improve waste management and develop a solution to the waste issue in the area⁴. It has been reported the Waste Bank in the area is limited and has not been maximized in sorting and utilizing plastic; furthermore, 1 out of 2 landfills in Kendal Regency has been closed.

The development of the Client's PET recycling facility would provide support for local communities and government agencies to process collected waste and recovery of recyclable materials, thus reducing concerns regarding community health and safety related to waste, which may include odour, cleanliness, health concerns, etc. Additionally, the Project would provide employment opportunities for local communities for work, for instance, the operational growth of third-party suppliers that would supply the Project's facility. With regards to the Client's existing Group-level ESMS which covers aspects such as Occupational Health & Safety, Labour and Working Conditions, etc. along their supply chain, labour risks that may arise due to the informal nature of the waste management sector in the region could be supported and monitored by the Client, particularly for those that will become a supplier of the Project.

Ultimately, the Project would contribute to local economic, environmental, and social growth within the region, and thus there is no need to further consider the 'No-Project' option.

3.5.2 Selection of Project Location

KIP was considered for the Project as it provides an established industrial site location with provided infrastructure including road, drainage, water, power, and other utilities and has surrounding compatible industries. Additionally, there is a growing market (the broader plastic industry market in Indonesia currently relies on imported polymer products). The region's plastic waste has increased from approximately 450.000 ton in 2018 to 950.000 ton in 2021 and doubled in the past 5 years⁵. Social considerations include the minimum wage where Kendal is situated at USD 155 per month, where Jakarta is at USD 283 per month. **Table 3.8** describe the consideration for KIP as the Project location.

³ [Sustainable Waste Indonesia | Promoting sustainable waste and resource efficiency in Indonesia » Plastics post-pandemic: Tragedy or opportunity? \(sw-indo.com\)](https://www.sw-indo.com)

⁴ [Portal Resmi Kabupaten Kendal :: Info Kendal \(kendalkab.go.id\)](https://www.kendalkab.go.id)

⁵ <https://sipsn.menlhk.go.id/sipsn/public/data/timbangan>

Table 3.8 Selection of Project Location

Consideration	Kendal Industrial Park	Gresik Industrial Park
Annual Plastic Waste	950,000 Ton (Central Java) 2021	600,000 Ton (East Java) 2021
Infrastructure	<ul style="list-style-type: none"> ■ Presence of other industrial complexes. ■ Infrastructure and utilities are in place to support the Project. ■ Close to export ports. 	<ul style="list-style-type: none"> ■ Presence of other industrial complexes. ■ Infrastructure and utilities are in place to support the Project. ■ Close to export ports.
Minimum wage per month	USD 155	USD 278

Gresik Industrial Park (GIP) was seen as a lesser attractive site as the volume of plastic is decreasing from approximately 850,000 ton in 2018 to 600,000 ton in 2021. In addition, the minimum wage is also double to what Kendal region has to offer.

3.5.3 Selection of Technology, Design, and Operations

The current proposed technology involves the production of rPET flakes from the PET plastic bottle. There is no other alternative technology to produce rPET flakes apart from washing, grinding, and cleaning.

The current design only utilizes PET bottle into rPET flakes. The next stage of the operation involves in selling the rPET flakes to business that produces PET pellets. rPET flakes is sold domestically. The following equipment will be provided at the Project:

- 1) Feed in Conveyor (Input) - Plastic Bottle;
- 2) Bale Breaker;
- 3) Sieving Machine;
- 4) Label Scraping Machine;
- 5) Bottle Sorters;
- 6) Metal Detectors;
- 7) Wet Grinders;
- 8) Hot Washers;
- 9) Drying and Rinsing;
- 10) Ultrasonic Rinsing;
- 11) Flake sorting;
- 12) Flake grinder; and
- 13) PET Flakes (Output) - Shipment to flakes buyer.

ALBA has chosen technology with which it is familiar and operates internationally as described in Section 3.

ENVIRONMENTAL AND SOCIAL BASELINE

This Section provides an overview of the environmental and socio-economic baseline conditions in the Project area based on secondary data from published sources as well as primary data on socio-economic aspects to fill the data gaps.

4.1 Approach and Methodology

The key sources of information presented in describing the Project area, for the purposes of the ESIA, are based on secondary data such as a review of published and publicly available information and supplementary information collected from and provided by various stakeholders consulted during the site visit as part of the ESIA.

4.2 Physical Environment Baseline

4.2.1 Topography and Slope

KIP covers a total area of 2,200 hectares and is situated in the administrative area of Kaliwungu district (477,300 hectares), Kendal Regency – Central Java Province. The Project itself only covers a 2.5 hectares area. The district is one of the lowest lying regions ranging just between 1 to 5 meters above sea level⁶. KIP is aware of the flood risks in this low-situated area and has implemented a pumping system to minimize the risk of flood during the wet season. Color shading of the region has shown that KIP is slightly above sea level (**Figure 4-1** below). The 2D and 3D overview of the Project area is depicted in **Figure 4-2**.

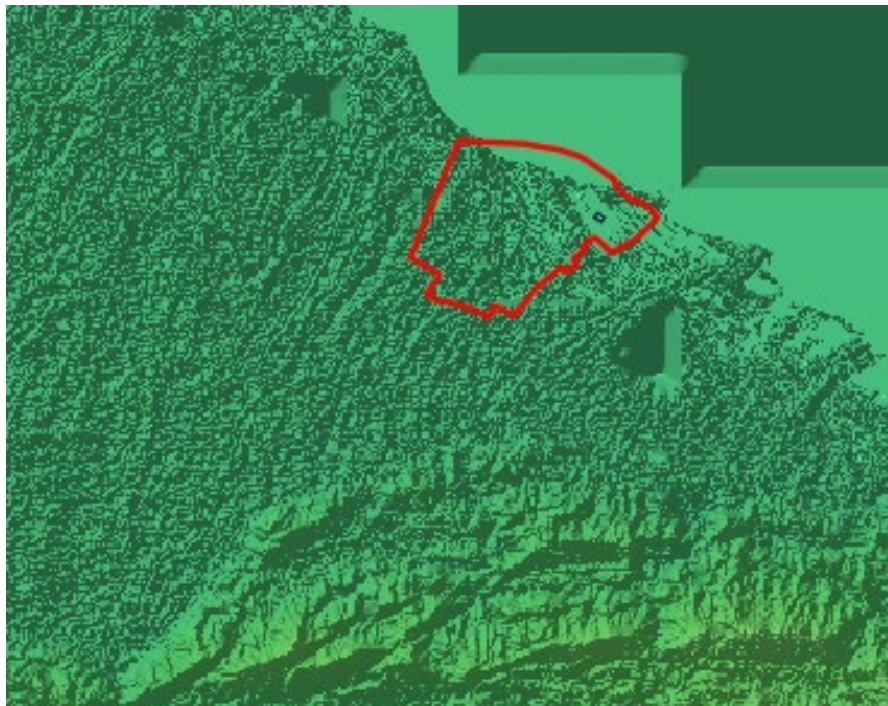


Figure 4.1 KIP Area

⁶ https://web.archive.org/web/20160916102517/https://kendalkab.bps.go.id/website/pdf_publicasi/Statistik-Daerah-Kecamatan-Kaliwungu-2016.pdf



Figure 4.2 Project Area Location

4.2.2 Land Use Classification

Table 4-1 below shows the land use classification in Kaliwungu District. From the total area of Kaliwungu District, 29% of it is used as a shrimp pond, 16% is used as farming land, 15% is residential, 6% is forest land owned by the government, and the rest is divided into other land use⁷. The Project site was inundated land part of an estuary⁸.

Table 4.1 Land Use Classification

Land Use	Area (Ha)	Percentage
Shrimp pond	140,400	29.42%
Farmland	80,700	16.91%
Residential	76,100	15.95%
Forest (government owned)	28,700	6.01%
Others	151,400	31.71%
TOTAL	477,300	100%

Initially, KIP was granted 1,000ha of land and later expanded into 2,200ha. Based on the initial environmental and social impact assessment baseline in 2014, KIP area was primarily divided into two types as described in Table 4-2.

Table 4.2 Type of Area within KIP

Land Use	Area (Ha)	Percentage
Shrimp pond*	613	61%
Farmland	387	39%
TOTAL	1,000	100%

*: the Project site was 100% shrimp pond

⁷ https://web.archive.org/web/20160916102517/https://kendakab.bps.go.id/website/pdf_publicasi/Statistik-Daerah-Kecamatan-Kaliwungu-2016.pdf

⁸ Sudirman, Nasir and Helmi, Muhammad (2019) *pemodelan spasial mangrove sebagai layanan ekosistem karbon biru pesisir (coastal blue carbon) di teluk semarang*. Masters thesis, School of Postgraduate. <http://eprints.undip.ac.id/72420/>

4.2.3 Hydrology

KIP is located by the shoreline of the Java Sea. The area is affected by the Waridin River catchment area. The main river in the area is known as Blorong River that does not directly run into the KIP however, it is branched off into the smaller river namely the Waridin River that passes through the KIP (**Figure 4-3 below**). The total catchment area covers over 603,800 hectares (DAS Waridin⁹). The Waridin River flows at the rate of 138m³ / second.

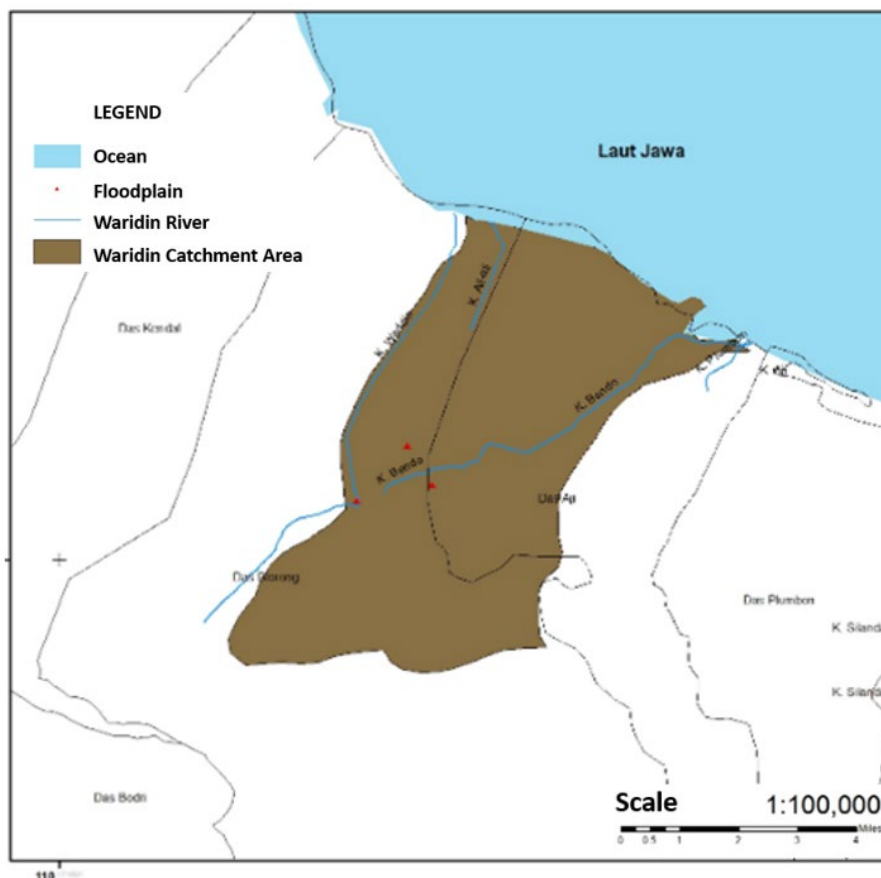


Figure 4.3 Glagah Waridin Watershed

The initial baseline data presented in the environmental and social impact assessment in 2014 indicate the following parameter shown in **Table 4-3** for the Blorong River. It is obtained from verbal information that currently the treated wastewater from KIP will not be discharged to the Blorong River but rather to the Waridin River. KIP plans to develop another WWTP and will discharge the treated effluent directly to the Java Sea. However, no additional information was available from the KIP's AMDAL document to verify the statement.

Table 4.3 Quality of Blorong River in 2014

Description	Unit	Result	Parameter/Baku Mutu
Total Suspended Solid (TSS)	mg/L	32,8	150
Total Dissolved Solid (TDS)	mg/L	133	-
Ph	mg/L	7,53	6-9
BOD	mg/L	2	50
COD	mg/L	<25	100

⁹ <https://bpusdataru-bk.jatengprov.go.id/index.php/informasi-sda/sungai/daerah-aliran-sungai/das-waridin>

Description	Unit	Result	Parameter/Baku Mutu
DO	mg/L	4,8	-
Phosphate	mg/L	0,02	-
NO3	mg/L	1,13	-
Cadmium (Cd)	mg/L	<0,0005	0,1
Hexavalent chromium (Cr6)	mg/L	<0,01	0,5
Copper (Cu)	mg/L	<0,005	2
Lead (Pb)	mg/L	<0,005	1
Zinc (Zn)	mg/L	<0,005	10
CL	mg/L	0	-
Cyanide	mg/L	<0,001	-
Fenol	mg/L	<0,01	1
Chlorine (CL2)	mg/L	1,75	-
Hydrogen sulfide (H2S)	mg/L	0,118	-
Water discharge	L/ha/second	-	0,8

Source: AMDAL KIP 2014

Refer to the surface water intake permit issued by the Head of investment and one-stop integrated services of Central Java Province (Decree letter no. 616/6830/2020 dated 5 August 2020), it allows KIP to extract surface water from the Blorong River with 200 liter/second capacity at the Karet dam (*Bendungan Karet*) and intake as raw water supply for its Water Treatment Plant.

4.2.4 Ambient Air Quality and Noise Level

The ambient air quality at KIP was relatively good with only the NO₂ parameter being above the standard, probably due to its nature as an industrial complex as shown in the initial baseline from the environmental and social impact assessment carried out in 2014 detailed in **Table 4-4** below.

Table 4.4 Ambient Air Quality of KIP in 2014

Particle	Unit	Coordinate 1	Coordinate 2	Coordinate 3	Coordinate 4	Standard (Government Regulation no 22 of 2021)	WHO Air Quality Guideline
		06°52'26.8"	06°52'38.6"	06°52'20.4"	06°52'56.4"		
		109°38'11.6"	109°38'32.2"	109°38'45.8"	109°38'06.1"		
SO ₂	µg/Nm ³	< 12.75	< 12.06	< 13.61	< 13.06	632	40
NO ₂	µg/Nm ³	< 1,225	< 1,116	< 2,986	< 5,868	316	25
NH ₃	µg/Nm ³	0.03	0.01	0.01	0.03	2.0	-
H ₂ S	µg/Nm ³	< 0.001	< 0.001	< 0.001	< 0.001	0.02	-
Oxidation	µg/Nm ³	25.74	26.60	29.04	30.79	200	100
CO ₂	µg/Nm ³	266.8	881.8	854.0	518.2	1,500	4 mg/g
Dust	µg/Nm ³	16.87	31.65	112.3	54.62	230	-

Source: AMDAL KIP, 2014

The testing was conducted in four sampling locations and the inside parameter of KIP (Coordinate 2 and 3) indicate a high level of carbon dioxide although still below standard. Only SO₂ and O₃ are in compliance with the World Health Organization's (WHO) air quality guidelines (AQG) threshold.

In regards to noise level, KIP conducted measurement of its noise level in two (2) locations as shown in **Table 4-5**. According to the measurement results, the noise level at the KIP’s entrance gate has exceeded the threshold for industrial areas set by national regulations, which is consistent with the noise level threshold outlined in the International Finance Corporation’s Environmental, Health, and Safety (IFC EHS) guidelines for noise beyond the property boundary of a facility at 70 dBA for industrial or commercial area. The elevated noise level is likely due to road traffic and surrounding activities in the area.

Table 4.5 Noise Level at KIP in 2014

Unit	Coordinate 1 Industrial Entrance***	Coordinate 2 Industrial Complex***	Threshold (Baku Mutu)*	IFC EHS Guideline (dBA)**
	06 ° 52'26,8"	06*52'38,6"		70
	109 ° 38'11,6"	109*38'32,2"		
Decibels (dB)	72.37	54.86	70	

*: Minister of Environment Regulation no 46 of 1997

**: One hour Laeq

***: data taken from KIP AMDAL, 2014

4.2.5 Precipitation

Using the Indonesian Central Bureau of Statistics data shown in **Figure 4-4**, the level of precipitation in Kendal can be defined as active (wet season) from December to April (ranging from 143mm to 947mm). In the recent period of 2019 to 2020, the trend of precipitation tends to become less intense and spread out throughout the whole year.

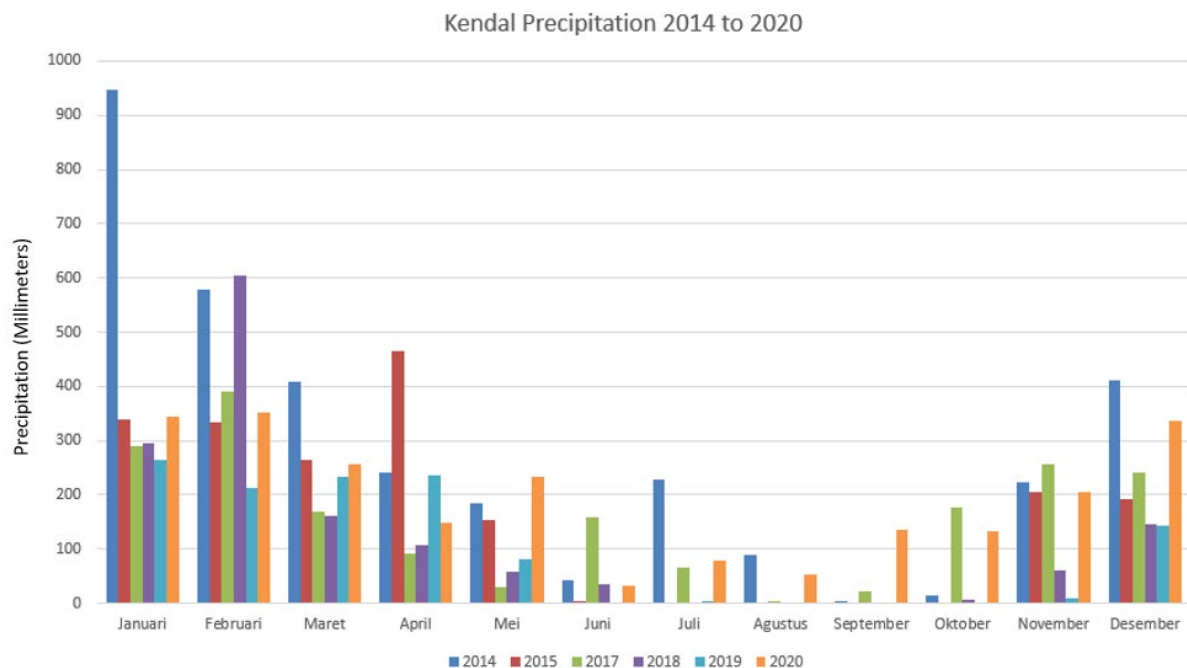


Figure 4.4 Kendal Precipitation

4.2.6 Soil

The soil condition in KIP is mostly filled with very soft clay. This initial data was extracted during the initial feasibility study of KIP. Data from *Lembaga Afiliasi Penelitian dan Industri (LAPI)* in the **Figure 4-5** shows that Kendal’s coastal area is subsiding at the rate of 1.0 to 2.4 cm per year (northern coast

is >2.4 cm/year while southern Kendal is <1.0 cm/year). Specific for the KIP, it face land subsidence at the average of 1.5 cm/year which are considered within manageable range compare to other coastal area in Northern Java. Further information on the soil assessment is available in the (X2b) *KIP Soil Condition and Land Filling Method* document. As of December 2022, the site has been backfilled by KIP. Due to the unknown sources of the soil, the Project Company carried out soil and groundwater test (Phase 2 Environmental Site Assessment) to understand the quality of the soil. The result of the test is presented in separate report..

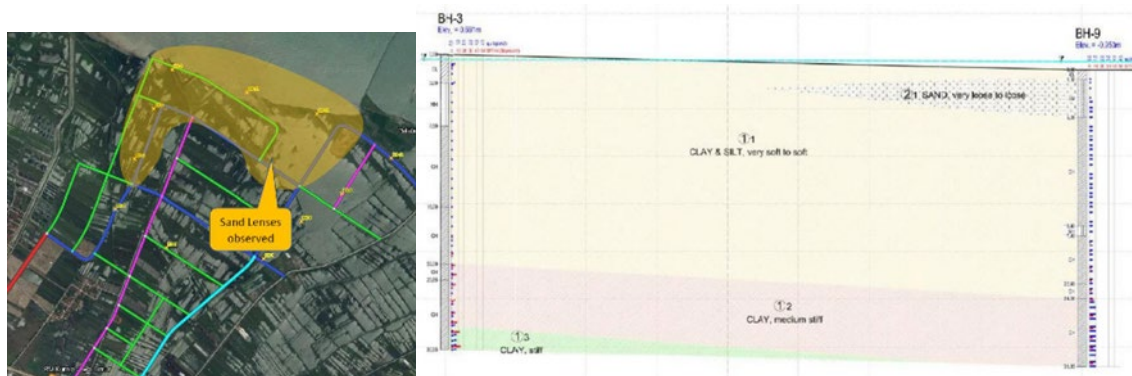


Figure 4.5 Soil Condition at KIP

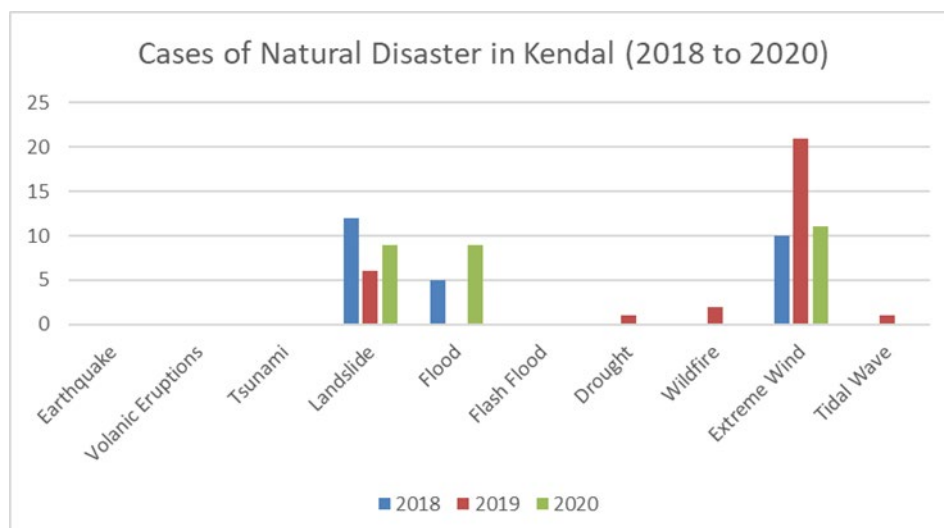
4.2.7 Natural disaster

Based on the Indonesian Central Bureau of Statistics data, the Kendal region experience landslide, floods, drought, wildfire, extreme wind (wind with up to 120km/hour speed), and tidal waves as shown in **Figure 4-6**. An event such as flash flood often occurs during the peak of the wet season from December to March, the latest one occurred in February 2022¹⁰. Land clearing promoted wind activity in the region, causing events such as wildfire to occur more often¹¹. In relation to KIP, the area possibly vulnerable to major natural disaster such as flood, sea level rise, water scarcity/ drought, and strong wind / tropical cyclone, as it is a highly modified area and located in the coast of the Java Sea where some major natural disaster such as flood commonly occur. Although KIP is equipped with water pumping system site may be impacted by climate anomaly such as El Nino and La Nina that can cause flooding and drought¹².

¹⁰ <https://www.liputankendalterkini.com/image/detail/1923/banjir-bandang-di-kik-kawasan-industri-kendal>

¹¹ https://bpbd.kendalkab.go.id/peta_bencana/page/2018/2/

¹² [Sekretariat Kabinet Republik Indonesia | BMKG Warns of La Nina Impact in Indonesia \(setkab.go.id\)](https://setkab.go.id/Sekretariat-Kabinet-Republik-Indonesia-BMKG-Warns-of-La-Nina-Impact-in-Indonesia)



Source: Kendal Regency in Figure 2020, 2019, 2018

Figure 4.6 Case of Natural Disaster

4.3 Ecological Baseline

4.3.1 Ecoregion

The Project area is situated in Kendal Regency, Central Java Province which is part of Western Java Rain Forest ecoregion (see **Figure 4-7**). This area is representing the lowland (below 1,000 m above sea level) which include several forest types such as tropical and subtropical moist broadleaf forests and consist of several forest subtypes – the evergreen rainforest, semi-evergreen rainforest, moist deciduous forest and dry deciduous forest. Based on the IBAT screening, there are no forest habitat within the 20km radius of the Project.

4.3.2 Biodiversity Hotspot

The Project area is located within the Sundaland Biodiversity Hotspot which covers the western half of the Indo-Malayan archipelago (1.5 million km²). However, based on our assessment there is no biodiversity hotspot identified within KIP and the Project area.

4.3.3 Key Biodiversity Area

Two Important Bird Areas (IBAs) are located within a 50 km radius of the Project area as detailed in the **Table 4-6** and **Figure 4-8**. Due to the distance of the Project from the IBAs and the limited size of the project area itself, the Project would not impact on the IBAs.

Table 4.6 Important Bird Area

IBAs	Distance to Project Area	Summary
Gunung Ungaran (ID095/ Ungaran Mountain)	~28 km to southeast	Location: S 7° 9'52.45" E 110°22'41.39" Size: 7.197 ha Significant populations of globally threatened species. Significant populations of endemic species known only to be found in a limited area.

IBAs	Distance to Project Area	Summary
Pegunungan Dieng (ID094)/ Dieng mountain range	~43 km to southwest	Location: S 7° 9'16.50" E 109°48'51.39" Size: 33.243 ha Significant populations of globally threatened species Significant populations of endemic species known only to be found in a limited area

4.3.3.1 Alliance for Zero Extinction Sites

No Alliance for Zero Extinction Sites are located within a 50 km radius of the Project Area.

4.3.3.2 Endemic Bird Area

The Project area is in the Javan Coastal Zone Endemic Bird Area (EBA) (refer to **Figure 4-9**). This EBA includes the coastal zone of Java, falling within the provinces of Jawa Barat (West Java), Jakarta, Jawa Tengah (Central Java), Yogyakarta and Jawa Timur (East Java), and the restricted-range birds occur (or formerly occurred) here in a variety of coastal habitats. It covers an area of 11,000 km² and there is no survey specifically done to determine if the endemic birds have been foraging in the area. The team only do site observation in the Project site from 31 August to 2 September 2022.

This EBA was designated due to the presence of the following species:

- Javan Coucal (*Centropus nigrorufus*): Vulnerable;
- Javan Plover (*Charadrius javanicus*): Least Concern;
- Javan Lapwing (*Vanellus macropterus*): Critically Endangered; and
- Javan White-eye (*Zosterops flavus*); Endangered.

Based on the site visit, the team did not observe any endemic bird. Due to the limited size of the Project area itself, the Project would not impact the endemic birds.

4.3.3.3 World Heritage Area

No World Heritage Areas are located within a 50 km radius of the Project area.

4.3.3.4 RAMSAR Sites

No RAMSAR Sites are located within a 50 km radius of the Project area.

4.3.3.5 Protected Areas

The Project area is not located within any Protected Areas. However, 11 Protected Areas are located within a 10 km and 50 km radius of the Project area (see **Figure 4-10**).

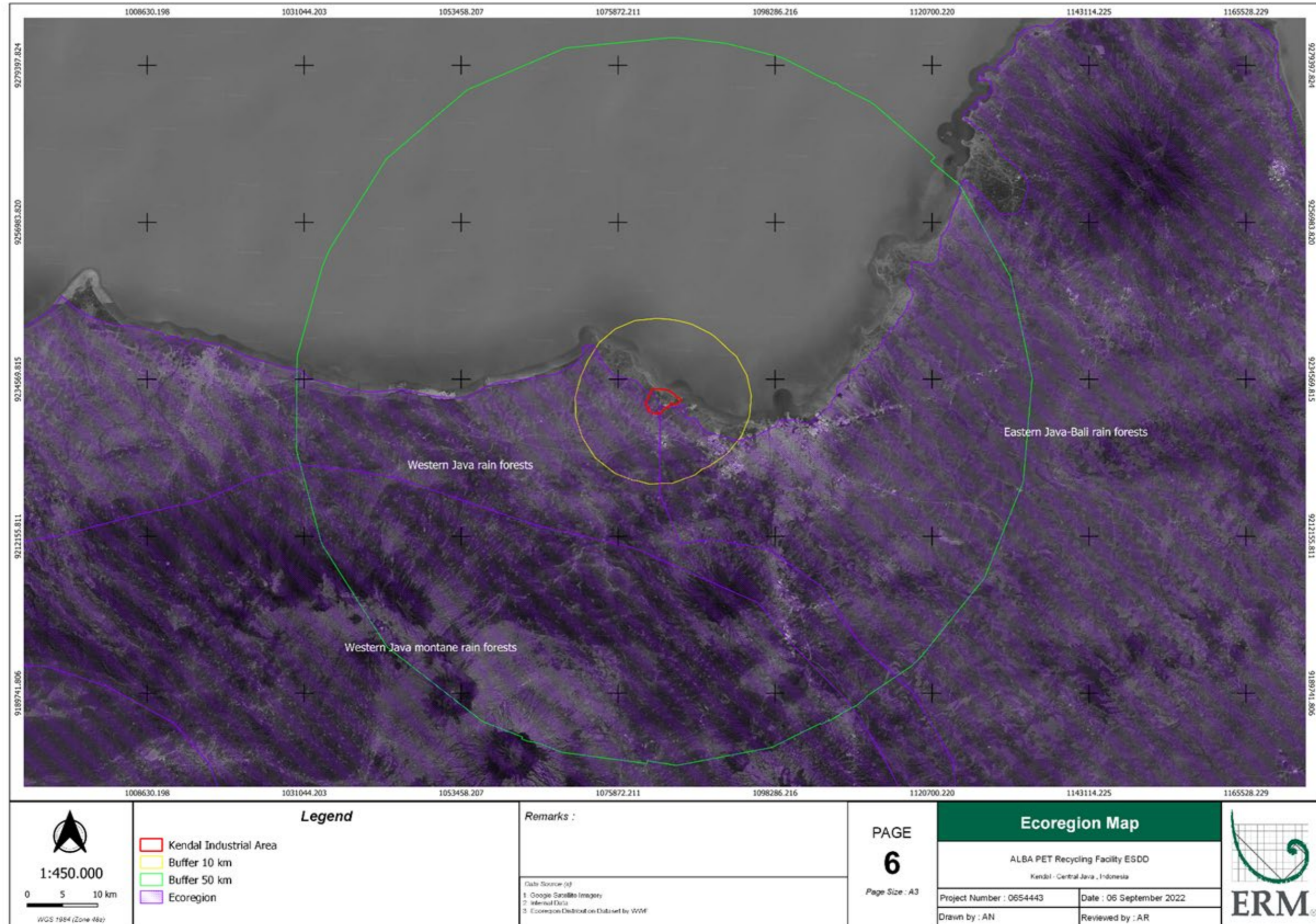


Figure 4.7 Ecoregion in the Project Area

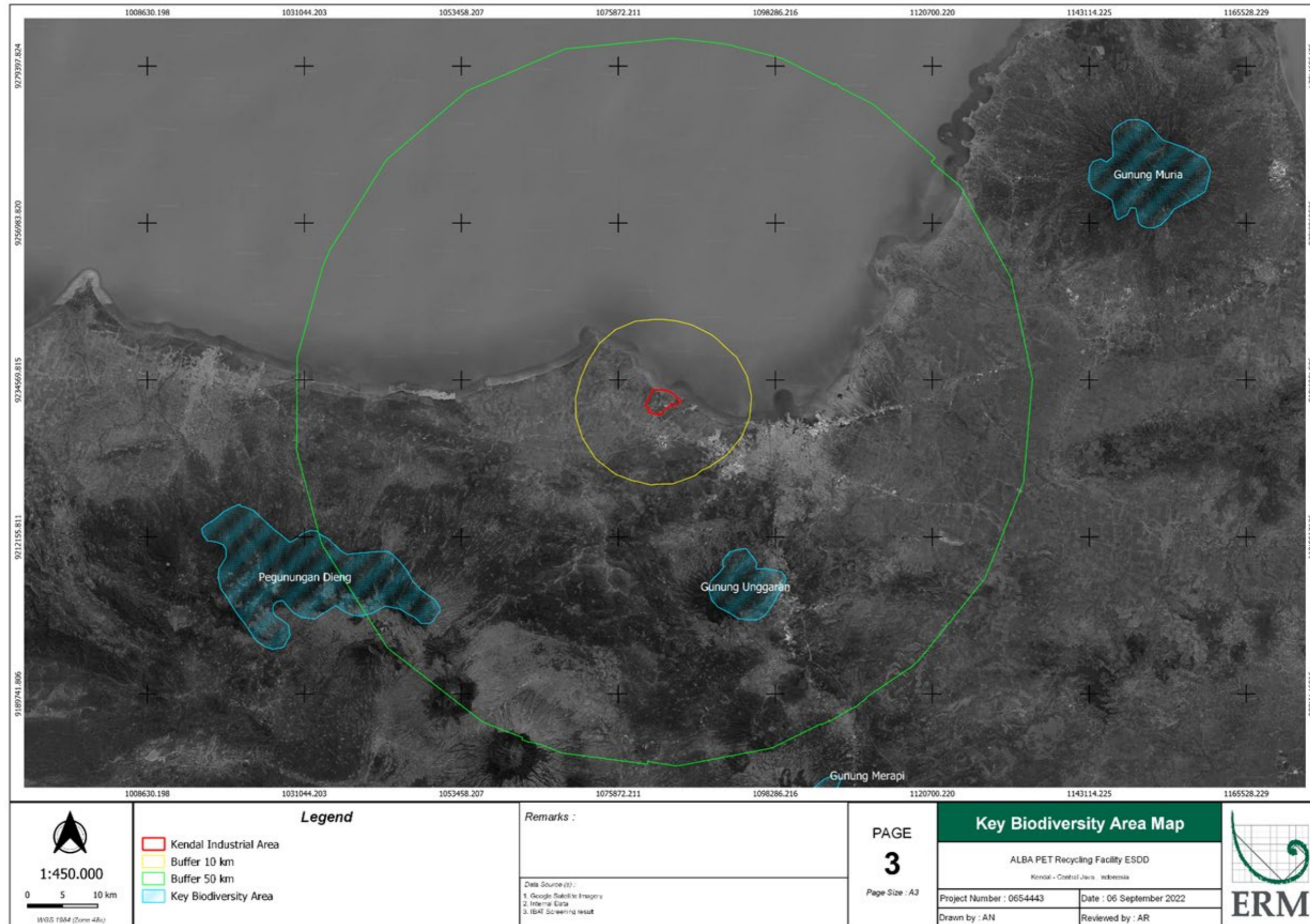


Figure 4.8 KBAs within 50 km Radius from the Project Area

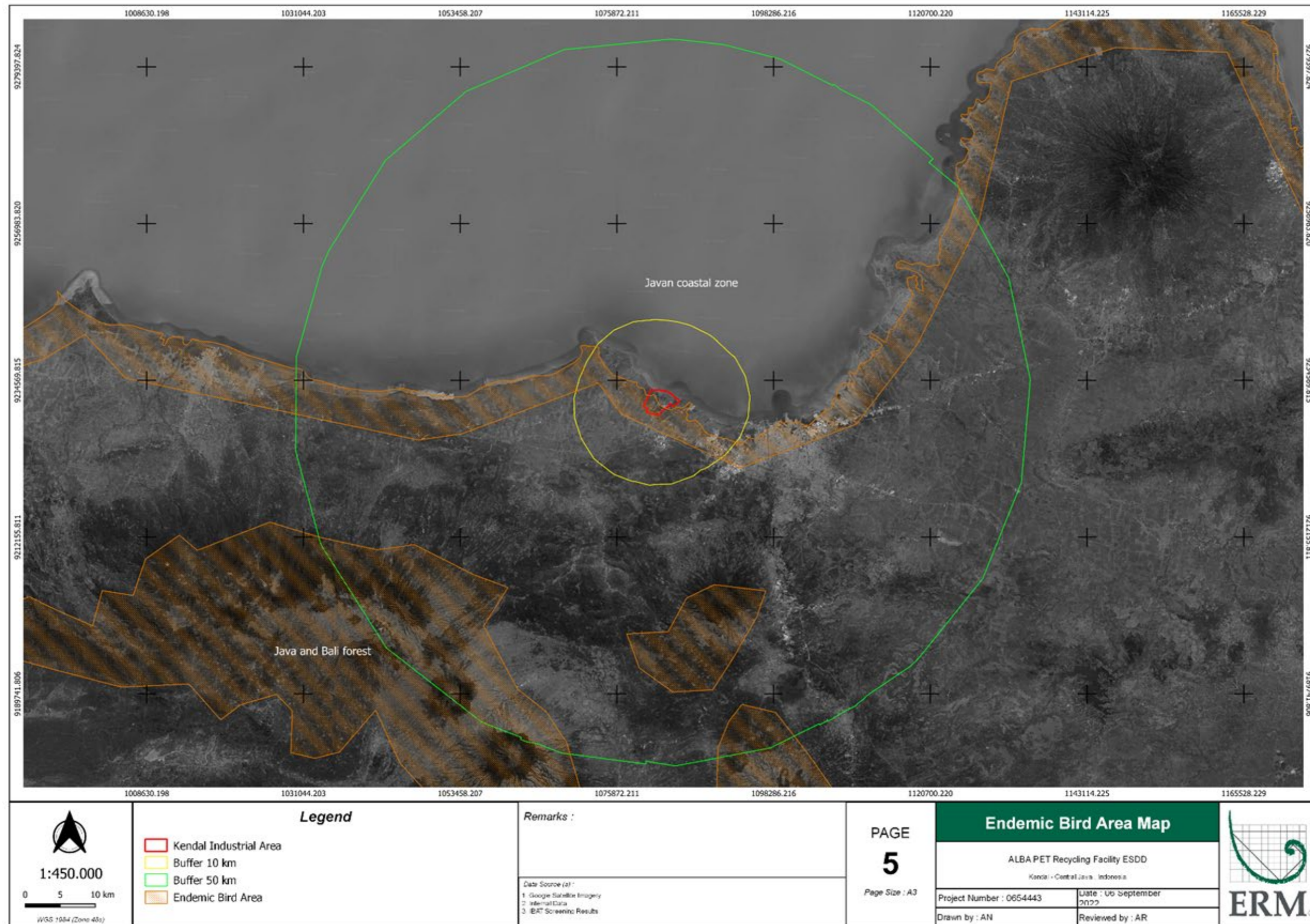


Figure 4.9 Endemic Bird Area in the surrounding of the Project Area

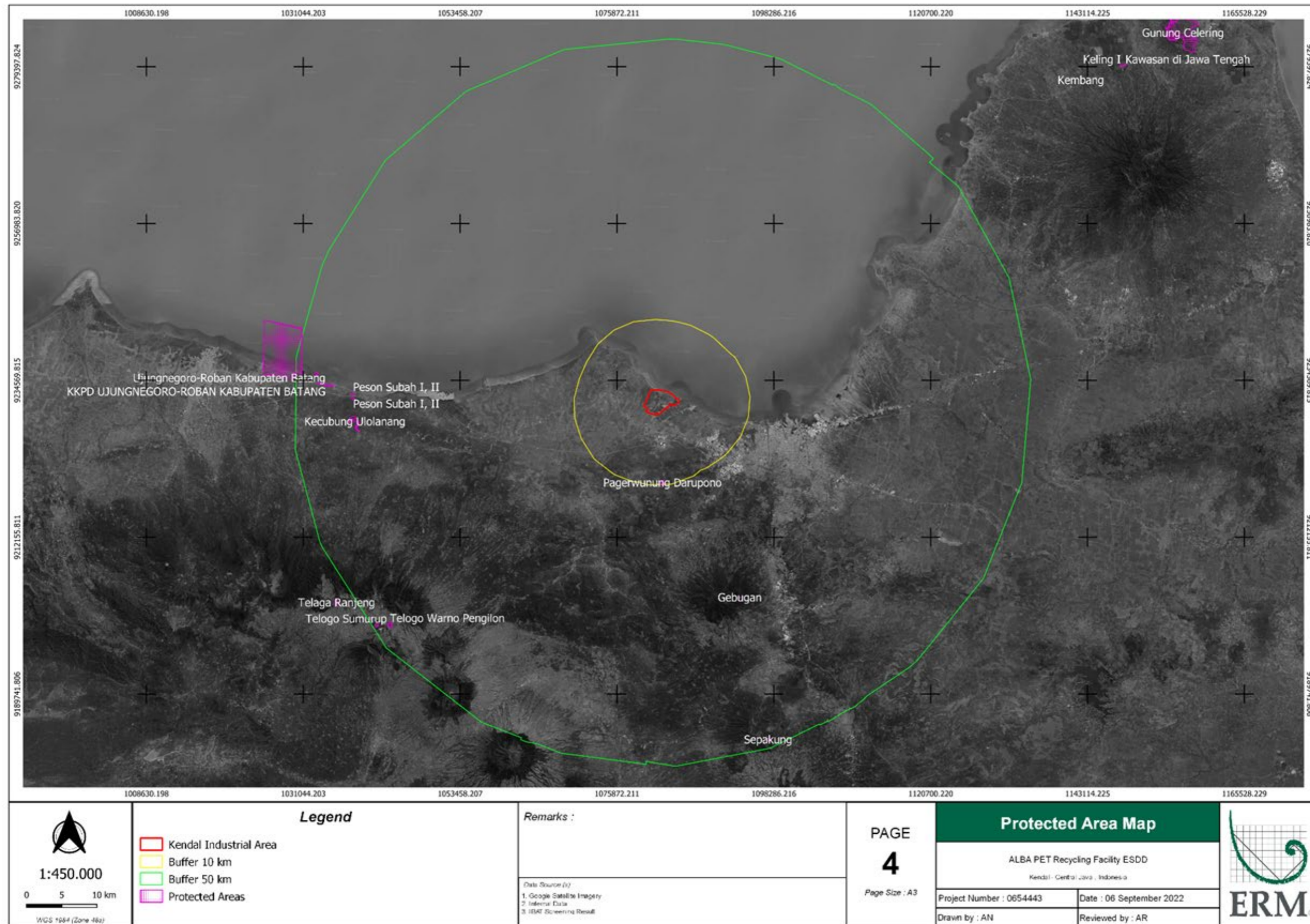


Figure 4.10 Protected Areas within 50 km radius of the Project Area

4.3.4 Modified Habitat

IFC PS 6 defined Natural habitats as areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition. However, on the project area itself, there were no natural habitat as it was previously used as a shrimp farm.

Modified habitats are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition (IFC 2012a). The modified habitat within and in the surrounding of the Project area includes in **Table 4-7** below.

There are patches of degraded mangrove habitat along the shoreline of KIP, however, the area will be constructed into an international port (**Figure 4-11**).

Table 4.7 Areas of Modified Habitat

Land Class	Habitat	Area (ha)
Building	Modified	89.7
Pond*	Modified	187.5
Mangrove	Degraded Natural Habitat	32.7
Water body	Modified	62.5
Total		372.4
*2.5 ha of 187.5 ha is the Project site		



Figure 4.11 Modified and Highly Modified Habitat within and surrounding the Project Area

4.3.5 Area of Influence and/or Area of Analysis

The Area of Influence (AoI) is a 500 m buffer surrounding all project boundaries. The AoI is the area within which direct impacts on habitats or species may occur during construction or operation. International best practice frequently cites 250 m as an appropriate AoI for linear infrastructure projects as this is the distance significant adverse air and noise impacts are recorded. This assessment applies the precautionary approach and therefore adopts a wider AoI.

All ecological receptors (protected areas, habitats, species) that are present or potentially present in the AoI are then assessed to determine if they meet the SPS CH criteria. If it is feasible that a species meets CH thresholds, and it is appropriate, an Ecologically Appropriate Area of Analysis (EAAA) is established for this species. An Ecologically Appropriate Area of Analysis (EAAA) is required to be defined, to determine the presence of Critical Habitat for each species or ecosystem that regularly occurs in the project's AoI. Delineating an EAAA requires consideration of: (i) the likely geographic area or extent of anticipated project activities and impacts; (ii) the full extent of ecosystems that might be affected in any way; and (iii) any additional areas that have a functional role in supporting those ecosystems or their associated biodiversity, for example the limits of relevant river catchments or watersheds needed to support a wetland.

It is observed during the site visit in end of August and December 2022 that there were patches of mangrove within the AoI. The most dense mangrove within AoI was observed to the North of the Project site that is in boundary with coastal area as shown in **Figure 4.12**. It also can be seen the presence of dense mangrove outside of the AoI which is to the Northeast of the Project site.

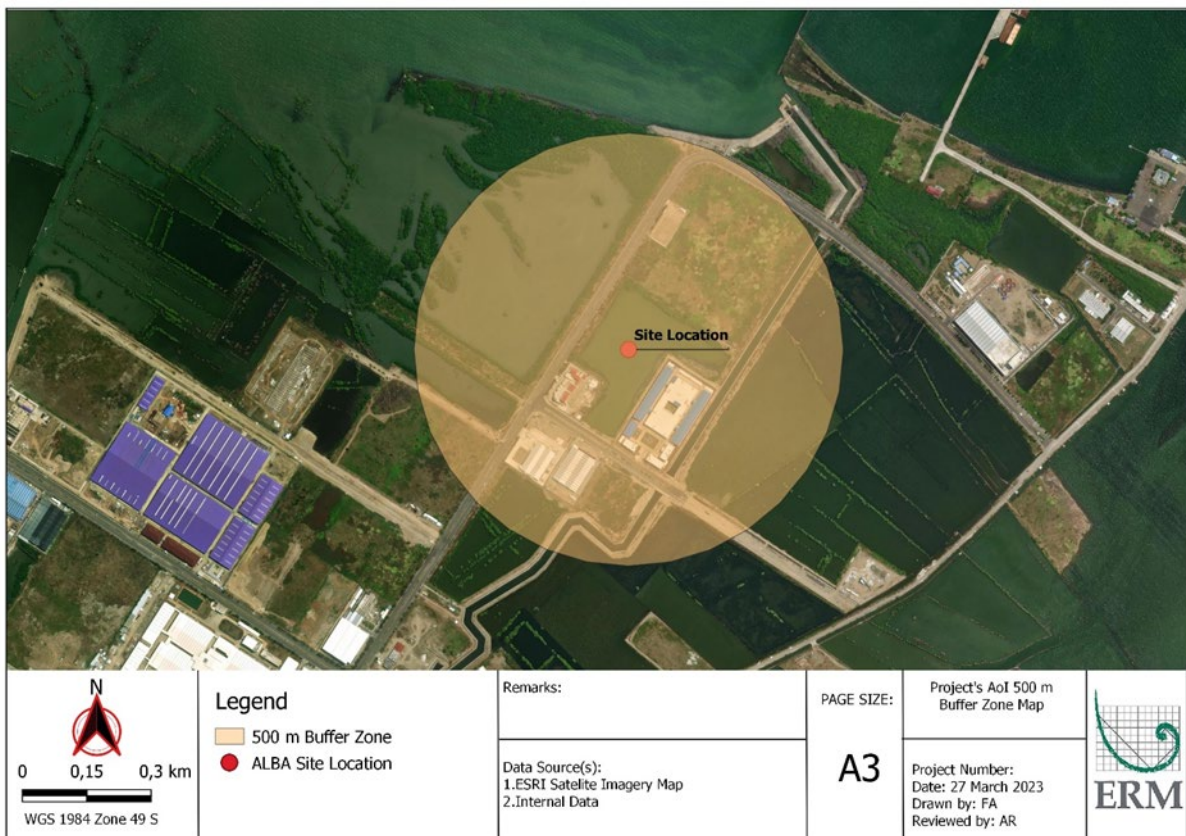


Figure 4.12 Distribution of Mangrove in AoI

4.3.5.1 Critical Habitat Screening

Screen Vertebrate Fauna from Integrated Biodiversity Assessment Tool (IBAT)

The first stage of the assessment, screening process, is predominantly research based and identifies all protected areas, habitats, and species present or potentially present within 50 km of the proposed route alignment. The Integrated Biodiversity Assessment Tool (IBAT) was used to provide much data of threatened species. The IBAT screening identified a number of the International Union for Conservation of Nature and Natural Resources (IUCN) Red-listed species (i.e., species under threat that require conservation action) that do or may occur within the Project Aol.

The Integrated Biodiversity Assessment Tool (IBAT) was used to identify threatened species likely to occur within or nearby the Project area. Fish or freshwater, invertebrates, and marine species are excluded and not considered to be at risk from the Project, and the field confirmatory survey therefore did not focus on these groups. An initial desk-based screening of species likely occurs within and in the 50 km area of the Project area is presented in **Table 4-8**.

Table 4.8 Threatened Species Potentially Occur within 50 km of the Project Boundary

No.	Scientific Name	Common Name	IUCN status Endemicity Status	CH Requirements*
Aves				
1.	<i>Acridotheres melanopterus</i>	Black-winged Myna	■ IUCN: EN ■ Restricted range: Yes	■ Criterion 1 ■ Criterion 2
2.	<i>Aethopyga eximia</i>	White-flanked Sunbird	■ IUCN: LC ■ Restricted range: Yes	■ Criterion 2
3.	<i>Alcedo euryzona</i>	Javan Bluebanded Kingfisher	■ IUCN: CR ■ Restricted range: Yes	■ Criterion 1 ■ Criterion 2
4.	<i>Alcippe pyrrhoptera</i>	Javan Fulvetta	■ IUCN: LC ■ Restricted range: Yes	■ Criterion 2
5.	<i>Alophoixus bres</i>	Browncheeked Bulbul	■ IUCN: EN ■ Restricted range: No	■ Criterion 1
6.	<i>Arborophila javanica</i>	Chestnut-bellied Partridge	■ IUCN: LC ■ Restricted range: Yes	■ Criterion 2
7.	<i>Calidris tenuirostris</i>	Great Knot	■ IUCN: EN ■ Restricted range: No	■ Criterion 1
8.	<i>Centropus nigrorufus</i>	Javan Coucal	■ IUCN: VU ■ Restricted range: Yes	■ Criterion 2
9.	<i>Chloropsis sonnerati</i>	Greater Green Leafbird	■ IUCN: EN ■ Restricted range: No	■ Criterion 1
10.	<i>Chrysocorythus estherae</i>	Mountain Serin	■ IUCN: LC ■ Restricted range: Yes	■ Criterion 2
11.	<i>Fregata andrewsi</i>	Christmas Frigatebird	■ IUCN: VU ■ Restricted range: Yes	■ Criterion 2 ■ Criterion 3 & 4
12.	<i>Fregata minor</i>	Great Frigatebird	■ IUCN: LC ■ Restricted range: Yes	■ Criterion 2 ■ Criterion 3

No.	Scientific Name	Common Name	IUCN status Endemicity Status	CH Requirements*
13.	<i>Geokichla interpres</i>	Chestnutcapped Thrush	■ IUCN: EN ■ Restricted range: No	■ Criterion 1
14.	<i>Gracupica jalla</i>	Javan Pied Starling	■ IUCN: CR ■ Restricted range: Yes	■ Criterion 1 ■ Criterion 2
15.	<i>Heleia javanica</i>	Javan Greythroated Whiteeye	■ IUCN: LC ■ Restricted range: Yes	■ Criterion 2
16.	<i>Hydrobates matsudairae</i>	Matsudaira's Storm-petrel	■ IUCN: VU ■ Restricted range: Yes	■ Criterion 2 ■ Criterion 3 & 4
17.	<i>Ixos virescens</i>	Javan Bulbul	■ IUCN: LC ■ Restricted range: Yes	■ Criterion 2
19.	<i>Myophonus glaucinus</i>	Javan Whistlingthrush	■ IUCN: LC ■ Restricted range: Yes	■ Criterion 2
20.	<i>Nisaetus bartelsi</i>	Javan-hawk Eagle	■ IUCN: EN ■ Restricted range: Yes	■ Criterion 1 ■ Criterion 2
21.	<i>Numenius madagascariensis</i>	Far Eastern Curlew	■ IUCN: EN ■ Restricted range: No	■ Criterion 1
22.	<i>Oriolus cruentus</i>	Javan Oriole	■ IUCN: DD ■ Restricted range: Yes	■ Criterion 2
23.	<i>Otus angelinae</i>	Javan Scops-owl	■ IUCN: VU ■ Restricted range: Yes	■ Criterion 2
24.	<i>Pavo muticus</i>	Green Peafowl	■ IUCN: EN ■ Restricted range: No	■ Criterion 1
25.	<i>Phylloscopus grammiceps</i>	Javan Warbler	■ IUCN: LC ■ Restricted range: Yes	■ Criterion 2
26.	<i>Psaltria exilis</i>	Pygmy Tit	■ IUCN: LC ■ Restricted range: Yes	■ Criterion 2
27.	<i>Psilopogon armillaris</i>	Flame-fronted Barbet	■ IUCN: LC ■ Restricted range: Yes	■ Criterion 2
28.	<i>Ptilinopus porphyreus</i>	Pink-headed Fruit-dove	■ IUCN: LC ■ Restricted range: Yes	■ Criterion 2
29.	<i>Rhipidura euryura</i>	White-bellied Fantail	■ IUCN: LC ■ Restricted range: Yes	■ Criterion 2
30.	<i>Stachyris grammiceps</i>	Whitebreasted Babbler	■ IUCN: NT ■ Restricted range: Yes	■ Criterion 2
31.	<i>Tesia superciliaris</i>	Javan Tesia	■ IUCN: NT ■ Restricted range: Yes	■ Criterion 2 ■
Mammalia				
32.	<i>Crocidura brunnea</i>	Thick-tailed Shrew	■ IUCN: LC ■ Restricted range: Yes	■ Criterion 2
33.	<i>Hylobates moloch</i>	Silvery Gibbon	■ IUCN: EN	■ Criterion 1

No.	Scientific Name	Common Name	IUCN status Endemicity Status	CH Requirements*
34.	<i>Macaca fascicularis</i>	Common Long-tailed Macaque	■ IUCN: EN	■ Criterion 1
35.	<i>Manis javanica</i>	Sunda Pangolin	■ IUCN: CR	■ Criterion 1
36.	<i>Nycticebus javanicus</i>	Javan Slow Loris	■ IUCN: CR ■ Restricted range: Yes	■ Criterion 1 ■ Criterion 2
37.	<i>Sus verrucosus</i>	Javan Warty Pig	■ IUCN: EN ■ Restricted range: Yes	■ Criterion 1 ■ Criterion 2
Amphibia				
38.	<i>Ichthyophis hypocyaneus</i>	Javan Caecilian	■ IUCN: LC ■ Restricted range: Yes	■ Criterion 2
39.	<i>Philautus jacobsoni</i>	Jacobson's Bubble-nest Frog	■ IUCN: CR ■ Restricted range: No	■ Criterion 1
Reptilia				
40.	<i>Cuora amboinensis</i>	Southeast Asian Box Turtle	■ IUCN: CR ■ Restricted range: No	■ Criterion 1

Legend:

IUCN (The International Union for Conservation of Nature and Natural Resources): **CR** = Critically Endangered; **EN** = Endangered; **VU** = Vulnerable; **NT** = Near Threatened; **LC** = Least Concern; **DD** = Data Deficient

This excludes fish or freshwater, invertebrates, and marine species

*: refer to section 4.3.6 for requirements explanation

The screening stage concludes with an assessment of which of these species are present or potentially present in the Project Aol. For the 40 species identified above, the likelihood of them occurring in the Project Aol is informed by their typical ranges, habitat requirements, movement and migratory routes, breeding sites, and populations distributions etc.

Verification from Available Information

Based on field confirmatory survey from 31st August to 2nd September 2022, there were 12 species observed in areas surrounding the Project site (see **Table 4-9**): Blue-tailed Bee-eater (*Merops philippinus*), Cinnamon Bittern (*Ixobrychus cinnamomeus*), Eastern-spotted Dove (*Spilopelia chinensis*), Eurasian Tree Sparrow (*Passer montanus*), Intermediate Egret (*Ardea intermedia*), Javan Pond Heron (*Ardeola speciosa*), Little Egret (*Egretta garzetta*), Oriental Darter (*Anhinga melanogaster*), Sooty-headed Bulbul (*Pycnonotus aurigaster*), Sunda Teal (*Anas gibberifrons*), Striated Heron (*Butorides striata*), and White-capped Munia (*Lonchura ferruginosa*).

Table 4.9 Species Observed During Field Confrimatory Survey

Taxonomic Group	Scientific Name	Common Name	Conservation Status			CH Requirements		
			IUCN Red List	Endemic	Indonesian Law P.106	1	2	3 & 4
Aves	<i>Anas gibberifrons</i>	Sunda Teal	NT	No	No	-	-	-
Aves	<i>Anhinga melanogaster</i>	Oriental Darter	NT	No	Protected	-	-	-
Aves	<i>Ardea intermedia</i>	Intermediate Egret	LC	No	No	-	-	-

Taxonomic Group	Scientific Name	Common Name	Conservation Status			CH Requirements		
			IUCN Red List	Endemic	Indonesian Law P.106	1	2	3 & 4
Aves	<i>Ardeola speciosa</i>	Javan Pond Heron	LC	No	No	-	-	-
Aves	<i>Butorides striata</i>	Striated Heron	LC	No	No	-	-	-
Aves	<i>Egretta garzetta</i>	Little Egret	NT	No	No	-	-	-
Aves	<i>Ixobrychus cinnamomeus</i>	Cinamon Bittern	LC	No	No	-	-	-
Aves	<i>Lonchura ferruginosa</i>	White-capped Munia	LC	No	No	-	-	-
Aves	<i>Merops philippinus</i>	Blue-tailed Bee-eater	LC	No	No	-	-	-
Aves	<i>Passer montanus</i>	Eurasian Tree Sparrow	LC	No	No	-	-	-
Aves	<i>Pycnonotus aurigaster</i>	Sooty-headed Bulbul	LC	No	No	-	-	-
Aves	<i>Spilopelia chinensis</i>	Eastern-spotted Dove	LC	No	No	-	-	-

Legend:

- IUCN (The International Union for Conservation of Nature and Natural Resources): **LC** = Least Concern; **NT** = Near Threatened.
- Regulation of the Minister of Environment and Forestry Number P.106/MENLHK/SETJEN/KUM.1/12/2018 regarding changes to Minister of Environment and Forestry Regulation Number P.20/MENLHK/SETJEN/KUM.1/6/2018 regarding Protected Plants and Animals.

Overview of species observed during the field confirmatory survey across the EAAA and potential species (in parentheses) from IBAT according to their IUCN Red List status is detailed in **Table 4-10**.

Table 4.10 Species Potentially Present within 50 km radius from Project Area

Taxonomic Group	Observed Species	Potential Species Extracted from IBAT	IUCN Red List Status					
			CR	EN	VU	NT	LC	DD
Aves	0	31	2	8	4	2	13	1
Mammalia	0	7	2	3	-	-	1	-
Amphibia	0	2	1	-	-	-	1	-
Reptilia	0	1	1	-	-	-	-	-

Legend:

- IUCN (The International Union for Conservation of Nature and Natural Resources): **CR** = Critically Endangered; **EN** = Endangered; **VU** = Vulnerable; **NT** = Near Threatened; **LC** = Least Concern; **DD** = Data Deficient.
- Exclude fish or freshwater and marine species.

All ecological receptors that are present or potentially present in the Project AoI are then assessed to determine if they meet the SPS criteria. In the absence of reliable population data, proxies such as the proportion of a species' distribution in the area, can be used to inform Critical Habitat determination. Appropriate population surrogates including extent of occurrence, range, or known sites of occurrence (mainly derived from the IUCN Red List data), were used to determine significance

with respect to the global population (IFC [2019] Guidance Note 77). Expert opinion and professional knowledge were used to make a reasonable judgement of potential significance. Where there is uncertainty about the population, range, and distribution of potentially occurring biodiversity features within the Project Aol and EAAA, a precautionary approach is applied, and the feature is retained for further assessment.

Refine the results of the Critical Habitat Screening

Data from available information and consultation with academic institutions and/or species experts were undertaken to help refine the results of the Critical Habitat Screening. Consultations with recognized external experts/specialists as detailed in **Table 4-11** was conducted to help determine whether the Project is located in Critical Habitat prior to the development of KIP. Information was gathered to support the assessment of highest priority species, and species where their characteristics are simply not known and there is lack of knowledge about their distribution and extent in the wider landscape.

Table 4.11 Expert Consulted

Name	Affiliation	Subject matter expertise
Dr. Margareta Rahayuningsih, M.Si.	Head Lecturer of Biology, Faculty of Mathematics and Science, The State University of Semarang (<i>Universitas Negeri Semarang</i> [UNNES]), Semarang, Central Java Province, Indonesia	Ornithology, Conservation Biology, Evolutionary Biology, Herpetology, Avian Ecology
Sebastian (Bas) van Balen	Research Director, Basilornis Consults, Muntendampad 15, 6835 BE Amhem, Netherlands.	Ornithologist, Conservation Biology, Avian Ecology

4.3.6 Critical Habitat Requirement

Critical Habitat (CH) is defined in the IFC PS 6 as areas with high biodiversity value, including:

- Habitat of significant importance to Critically Endangered and/or Endangered species;
- Habitat of significant importance to endemic and/or restricted-range species;
- Habitat supporting globally significant concentrations of migratory species and/or congregatory species;
- Highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes.

To help determine if Critical Habitat is present in the Project Aol, the International Finance Corporation (IFC) Guidance Note (GN) 6 has been adopted throughout this process.

4.3.6.1 Critical Habitat Requirement 1 (Endangered Species)

The corresponding IFC GN(6) guidance for this requirement adds further detail to allow more accurate assessment, and is as follows:

- Areas that support globally important concentrations of an IUCN Red-listed EN or CR species (0.5 % of the global population and 5 reproductive units of a CR or EN species);
- Areas that support globally important concentrations of an IUCN Red-listed VU species, the loss of which would result in the change of the IUCN Red List status to EN or CR and meet the thresholds in (a); and

- As appropriate, areas containing nationally/regionally-important concentrations of an IUCN Red-listed EN or CR species.

4.3.6.2 Critical Habitat Requirement 2 (Restricted-range Species)

The IFC GN(6) defines a terrestrial restricted range species as that with an EOO (Extent of Occurrence) of less than 50,000 km². The Critical habitat threshold this requirement is as follows:

- Areas that regularly hold ≥ 10 % of the global population size and ≥ 10 reproductive units of a species.

4.3.6.3 Critical Habitat Requirement 3 and 4 (Migratory and Congregatory Species)

The Critical habitat threshold this requirement is as follows:

- Areas known to sustain, on a cyclical or otherwise regular basis, ≥ 1 % of the global population of a migratory or congregatory species at any point of the species' lifecycle; and
- Areas that predictably support ≥ 10 % of the global population of a species during periods of environmental stress.

4.3.6.4 Critical Habitat Requirement 5 (Evolutionary Process and Ecosystem Services)

As part of the precautionary approach and because the methods are informed by IFC GN6, the IFC Criterion 4 'Highly Threatened or Unique Ecosystems' has also been assessed.

4.3.6.5 Critical Habitat Requirement 6 (Community Importance)

Critical habitat includes areas having biodiversity of significant social, economic, or cultural importance to local communities.

4.3.6.6 Critical Habitat Requirement 7 (Protected or Designated Areas)

Critical habitat includes areas either legally protected or officially proposed for protection, such as areas that meet the criteria of the World Conservation Union classification, the Ramsar List of Wetlands of International Importance, and the United Nations Educational, Scientific, and Cultural Organization's world natural heritage sites.

4.3.7 Results of Critical Habitat Requirements

The results of the screening stage are summarised below for each the seven SPS criteria. Each criteria concludes whether the proposed project triggers Critical Habitat.

4.3.7.1 Results of Critical Habitat Requirement 1 - 4: Endangered Species, Restricted-range Species, Migratory and Congregatory Species.

Out of a total of 78 species that were extracted from IBAT, 40 species that potentially qualified the Project as Critical Habitat were taken forward in this assessment as detailed in **Table 4-8**. However, due to the fact that KIP have already purchased the whole land and is already under construction for the Industrial zone, KIP is classified as modified habitat. However, the presence of patchy mangrove within Aol from site observation as well as the presence of Javan White-eye from eBird (<https://ebird.org/species/jaweeye2>) might trigger critical habitat requirement for the whole Industrial Park. Nonetheless, the Project site only occupy 0.1% of the total area of KIP. Therefore, critical habitat requirement 1 – 4 unlikely applicable to the Project site.

Refer to the initial baseline of KIP AMDAL 2014, they have identified three species of IUCN red list (Little Egret (Egretta Garzetta), Kingfisher (Halcyon Chloris), Javan Pond Heron (Ardeola Speciosa).

However, these birds may hover across a large region and sometimes may land in in 50km radius of the IBAT zone.

4.3.7.2 Results of Critical Habitat Requirement 5: Evolutionary Process and Ecosystem Services

IFS PS 6 GN provides quantitative CH (Critical Habitat) trigger thresholds for this criterion for ecosystems that have been assessed as CR (Critically Endangered) or EN (Endangered) within the auspice of IUCN's ongoing effort to render a global red-list of ecosystems. None of the ecosystem's type are found in Project site which occupy 0.1% of the total KIP area. The Project site does not fit these criteria. Therefore, there are no available quantitative thresholds for assessing the Project under IFC Criterion 4 (IFC GN6, 2019). Prior to the development of KIP, the area was primarily divided into two types (Farmland and Shrimp Pond) based on KIP ESIA 2014. The patch of mangrove along the shoreline of KIP was identified in the ESIA 2014, however, there were no action plan in conserving the habitat. The KIP master plan indicate that the whole shoreline will be constructed into an international port.

The critical habitat requirement 5 does not apply to the Project site.

4.3.7.3 Results of Critical Habitat Requirement 6: Community Importance

No Species of significant social, economic or cultural importance have been identified. Based on the field observation the 1st of September 2022, temporary food stalls were constructed adjacent to the mangrove habitat. Rubbish was found in almost all mangrove areas. The community does not seem to have significant ties to the mangrove habitat. They often use the area as recreational ground during the sunset.

The critical habitat requirement 6 does not apply to the Project site.

4.3.7.4 Results of Critical Habitat Requirement 7: Protected or Designated Areas

There are 11 protected areas and two (2) Important Bird Areas (IBA) within the 50 km radius from Project area boundary. The IBA and Protected areas are not within the Area of Impact for the Project and thus no direct impacts are anticipated on the site. However, the biodiversity features that the site has been designated for might move beyond the IBA or Protected area boundaries and could require more detailed analysis if they potentially trigger other CH requirements.

The critical habitat requirement 7 does not apply to the Project site.

4.4 Socio-Economic and Cultural Baseline

The social baseline data is based on primary and secondary data from the Project area. The following sources of information were used:

- Village data from village office of Wonorejo, Mororejo, Kumpulrejo and Brangsong (2022);
- Central Java Province in Figure, Central Bureau of Statistics (2022);
- Kendal Regency in Figure, Central Bureau of Statistics (2022);
- Kaliwungu District in Figure, Central Bureau of Statistics (2021); and
- Brangsong District in Figure, Central Bureau of Statistics (2021).

Information also extracted from publicly available information, such as websites, online news, and academic journal/ papers. Primary baseline data was collected during the site visit from 30 August to 02 September 2022. The ERM team carried out Key Informant Interviews (KII) and Focus Group Discussions (FGD) with various members of the community and other key stakeholders.

4.4.1 Administrative Divisions

4.4.1.1 Territorial Structure

Indonesia's territorial administration is divided by province, followed by regency/municipality (city), district and sub-district/village. The villages in the surrounding area of the KIP include Wonorejo, Mororejo, Kumpulrejo and Brangsong villages and is located in Kaliwungu and Brangsong district. Administratively, Kaliwungu district borders directly with Java Sea to the north, Brangsong district to the west, and Semarang city to the east. Brangsong district borders directly with Java Sea to the north, Kaliwungu and Ngampel district to the south, and Kendal city to the west.

Based on the data obtained from the Central Bureau of Statistics (BPS) of Kaliwungu and Brangsong district, the total area of Kaliwungu district is 47.73 km² consisting of 9 villages and the total area of Brangsong district is 35.54 km² consisting of 12 villages. The closest villages that are most likely to be affected are presented in detail in **Table 4-12** below.

Table 4.12 Administrative Areas in the Project Area

District	Village	Area (Km ²)
Kaliwungu	Wonorejo	12.05
	Mororejo	14.35
	Kumpulrejo	1.,25
Brangsong	Brangsong	2.84

Source: Kaliwungu District in Figures, 2021, Brangsong District in Figures, 2021

4.4.1.2 Governance and Administration

Indonesia began to implement a decentralized government system through the enactment of Laws No. 22/1999 and No. 32/2004. These laws give greater authority to local governments, particularly municipalities and regencies, to execute a wide range of responsibilities in areas such as health, education, public works, environment, communication, transport, agriculture, manufacturing industry and trade, capital investment, land, cooperatives, labour force, and infrastructure services. The provincial government is the representative of the national government to manage regencies/ municipalities under its administration¹³.

Sub-districts (urban village) and villages are the lowest government administration. To ease the coordination within the administrative area, each sub-district/ village is divided into hamlets called *Rukun Warga* (RW) and further broken down into neighbourhoods called *Rukun Tetangga* (RT), the number of households depending on the size and density of the area. Heads of village or sub-district are central figures in the villages surrounding KIP, i.e., Wonorejo, Mororejo, Kumpulrejo and Brangsong Villages. They are responsible for implementing government development programs, for example by distributing social assistance, selecting participants to receive social programs, etc.

The village/sub-district heads also have a role in conflict resolution involving community members. Usually, community conflicts will be escalated to the police authority only if not solved by the village/ sub-district head. Another central role played by the village/sub-district head is leading the decision-making process during the village development planning (*Musrenbang*). In the village planning process, representatives of the community such as village apparatus, women's groups (PKK), youth

¹³ ADBI Institute. (2016). Government Decentralization Program in Indonesia. Retrieved from: <https://www.adbi.org/sites/default/files/publication/201116/adbi-wp601.pdf> [Accessed February 2022]

groups (*Karang Taruna*), religious leaders and other informal leaders such as respected elders are invited to suggest development priorities in their area.

4.4.2 Demographic and Population

4.4.2.1 Population

The detail of population data for villages in both districts are presented in the **Table 4-13** below.

Table 4.13 Population of Kaliwungu and Brangsong District

Village	Population	Population Density (per km ²)
Kaliwungu District		
Kumpulrejo ^{*)}	2,737	2,190
Karangtengah	3,956	3,297
Sarirejo	11,056	8,313
Kranjankulon	9,816	4,544
Kutoharjo	11,176	4,838
Nolokerto	8,696	1,676
Sumberejo	7,779	987
Mororejo ^{*)}	6,922	482
Wonorejo ^{*)}	4,019	334
Brangsong District		
Tunggulsari	4,667	871
Sumur	4661	1879
Penjalin	2019	821
Kertomulyo	4874	1867
Blorok	2546	1622
Sidorejo	5857	3931
Tosari	4025	2666
Rejosari	4697	3111
Turunrejo	4233	478
Purwokerto	3927	999
Brangsong ^{*)}	6645	2340
Kebonadem	2550	2742

^{*)} Project affected villages

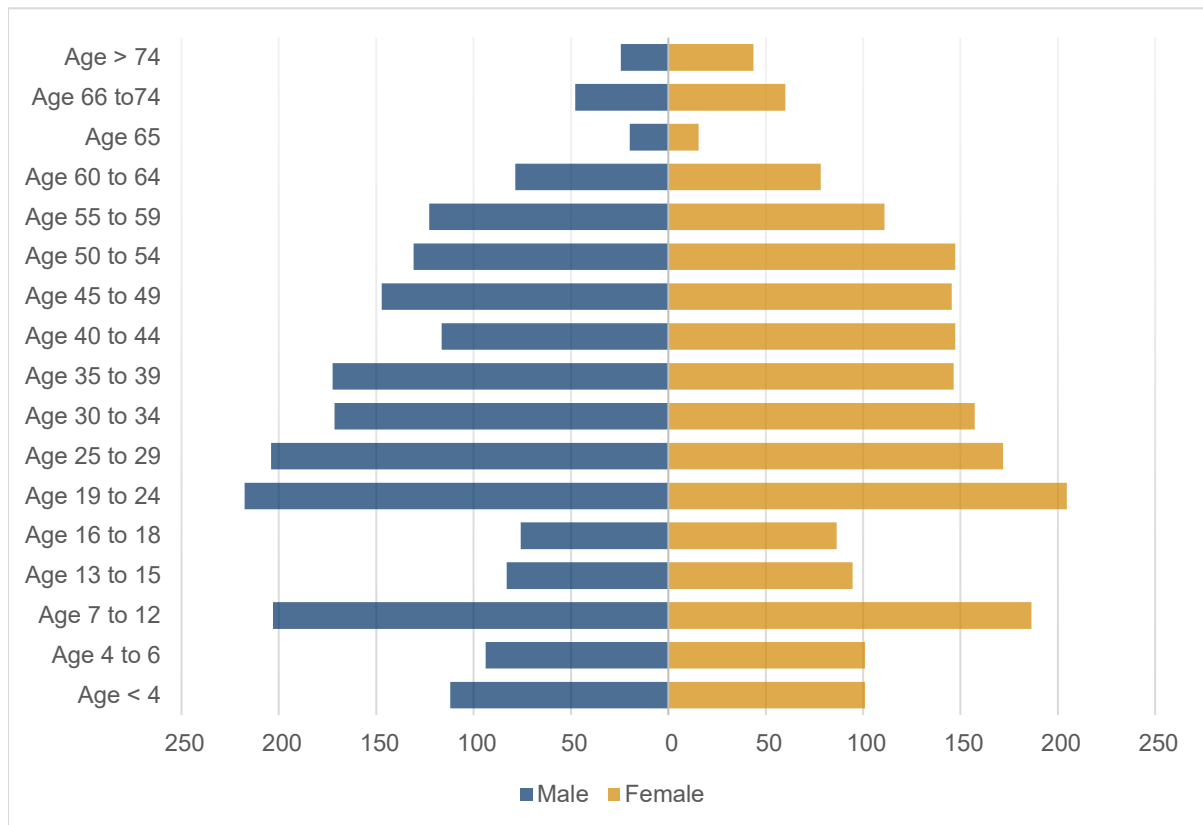
Source: Kaliwungu District in Figures, 2021, Brangsong District in Figures, 2021

4.4.2.2 Age and Gender Distribution

To further inform the age characteristics of the population in the areas surrounding the Project, the district population can be divided into productive age and non-productive age. Refer to the Ministry of Health Decree No. HK.01.07/Menkes/5675/2021 regarding Population Data for the Health Development Target year 2021 – 2025, the population can be divided into productive and non-productive age. The productive age population covers individuals aged between 15 and 64 years old, while the non-productive age population includes individuals aged 0 to 14 years old and above 65 years old. In addition to, according to the Law no. 20 of 1999 regarding Ratification of ILO convention no 138 concerning Minimum Age for Admission to Employment, Indonesia declare minimum age for employment is 15 years old except for type of work with health, safety and moral hazard the minimum age is 18 years. The presence of productive age also shows the number of workforce number where they will search, compete, and available for employment opportunity.

A. Wonorejo Village

The age and gender characteristics of the population in Wonorejo village is illustrated in the **Figure 4.13**.



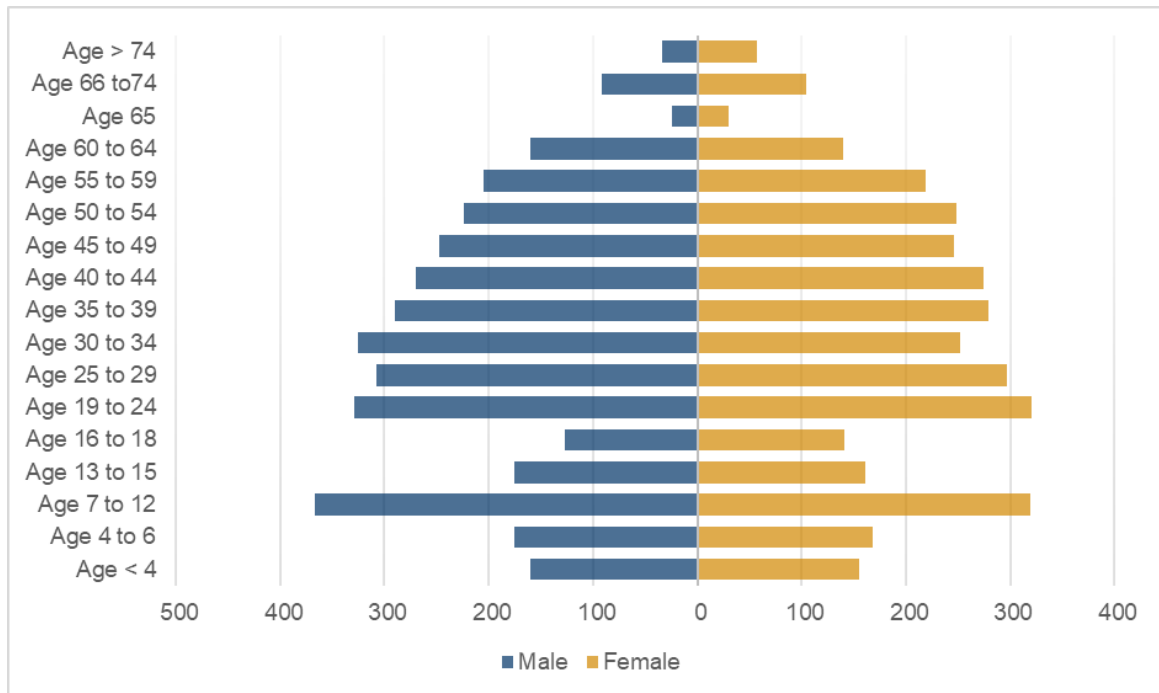
Source: Kaliwungu District in Figures, 2021

Figure 4.13 Gender and Age Structure in Wonorejo Village

As shown above, the age dependency rate for Wonorejo village in 2021 is 42%, indicating that for every 100 people in productive age, there are 42 people who have yet to reach productive age or who are not within productive age anymore while the number of productive age (between 15 and 64 years old) is 2,833 people which shows that they are already employed or available for employment.

B. Monorejo Village

The age and gender characteristics of the population in Monorejo village is illustrated in the **Figure 4.14**.



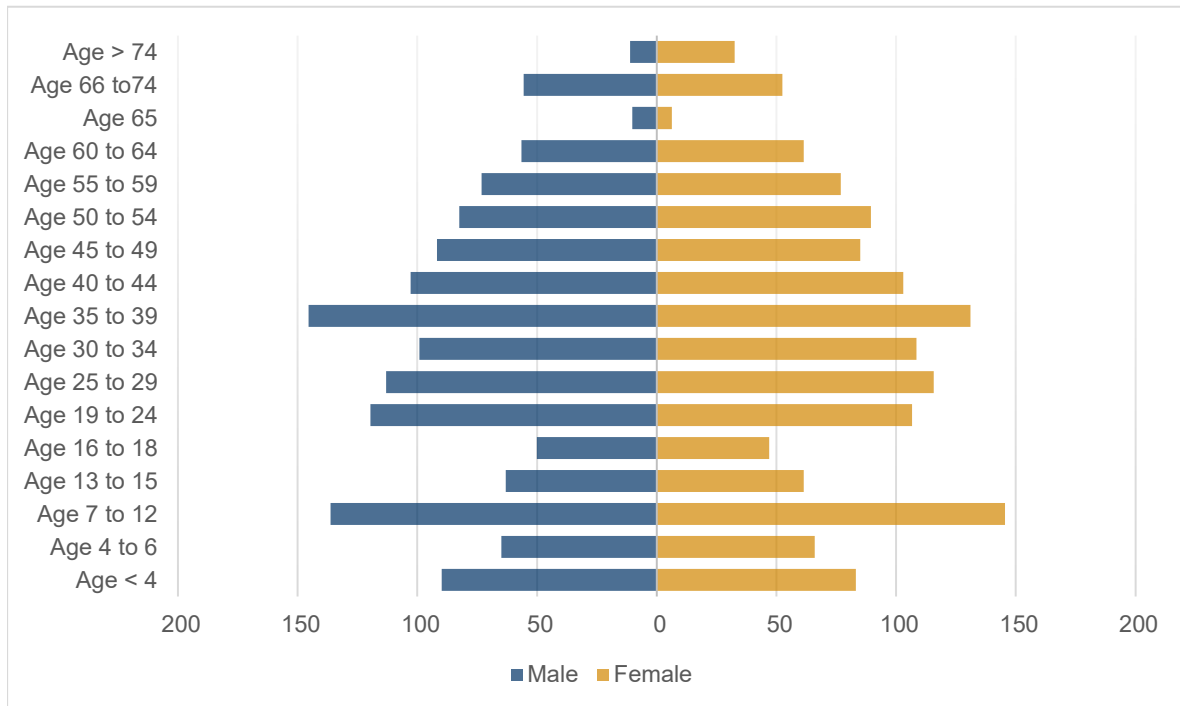
Source: Kaliwungu District in Figures, 2021

Figure 4.14 Gender and Age Structure in Monorejo Village

Based on the figure above, Monorejo Village dependency ratio is 41% indicating that for every 100 productive age people, there are about 41 people who have yet to be productive or have passed productive age and the number of productive age is 4,902 people.

C. Kumpulrejo Village

The age and gender characteristics of the population in Kumpulrejo village is illustrated in the **Figure 4.15**.



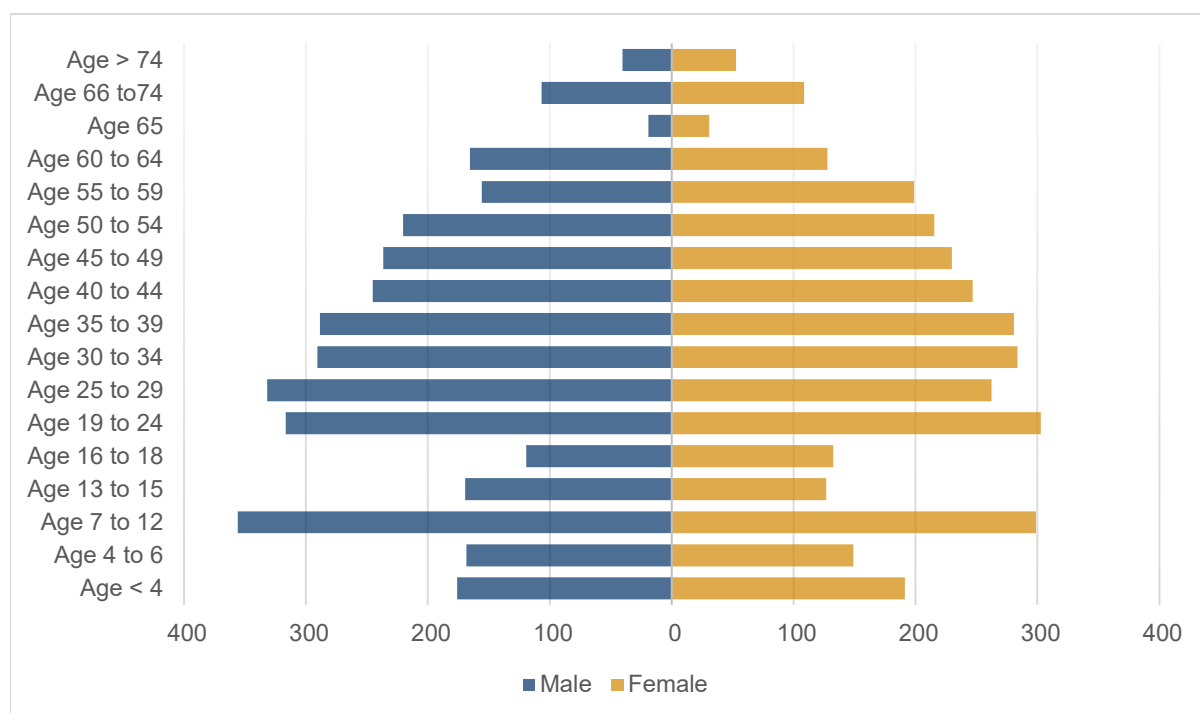
Source: Kaliwungu District in Figures, 2021

Figure 4.15 Gender and Age Structure in Kumpulrejo Village

Based on the figure above, it can be stated that Kumpulrejo Village's dependency ratio is 47% indicating that for every 100 productive age people, there are about 47 people who have yet to be productive or have passed productive age and the number of productive age is 1,859 people.

D. Brangsong Village

The age and gender characteristics of the population in Brangsong village is illustrated in the **Figure 4.16**.



Source: Brangsong District in Figures, 2021

Figure 4.16 Gender and Age Structure in Brangsong Village

Based on the figure above, Brangsong Village’s dependency ratio is 43% indicating that for every 100 productive age people, there are about 43 people who have yet to be productive or passed productive age and the number of productive age is 4,651 people.

4.4.2.3 Gender

Most of the population in study area is male with a gender ratio in Wonorejo village 101.2, Mororejo village 102.9, and Brangsong village 105.2. In another way, the population in Kumpulrejo village is female with a gender ratio 99.5. Based on site visit assessment, the local communities generally follow traditional gender roles. For example, majority of women are housewives and are responsible for domestic aspect of household, while men are income earners working as laborers and village government. However, there is no indication of prohibition against women for employment and education opportunities. The population structure in location of study is presented in further details in **Table 4-14** below.

Table 4.14 Gender Distribution by Village in Kaliwungu and Brangsong Districts

Village	Male		Female		Gender Ratio
	Population	%	Population	%	
Kaliwungu District					
Kumpulrejo *)	1,365	49,9%	1,372	50,1%	99.05
Karangtengah	1,989	50,3%	1,967	49,7%	101.01.
Sarirejo	5,583	50,5%	5,473	49,5%	102.
Kranjankulon	4,907	50,0%	4,909	50,0%	100.00.00
Kutoharjo	5,7	51,0%	5,476	49,0%	104

Village	Male		Female		Gender Ratio
	Population	%	Population	%	
Nolokerto	4,383	50,4%	4,313	49,6%	101
Sumberejo	3,866	49,7%	3,913	50,3%	98
Mororejo ^{*)}	3,511	50,7%	3,411	49,3%	102
Wonorejo ^{*)}	2,021	50,3%	1,998	49,7%	101
Brangsong District					
Tunggulsari	2,376	50,9%	2,291	49,1%	103
Sumur	2,365	50,7%	2,296	49,3%	103
Penjalin	1,021	0,1%	998	99,9%	102
Kertomulyo	2,507	51,4%	2,367	48,6%	105
Blorok	1,218	47,8%	1,328	52,2%	91
Sidorejo	2,899	49,5%	2,958	50,5%	98
Tosari	2,012	50,0%	2,013	50,0%	100
Rejosari	2,381	50,7%	2,316	49,3%	102
Turunrejo	2,184	51,6%	2,049	48,4%	106
Purwokerto	1,98	50,4%	1,947	49,6%	101
Brangsong ^{*)}	3,406	51,3%	3,239	48,7%	105
Kebonadem	1,284	50,4%	1,266	49,6%	101

^{*)} Project affected villages

Source: Kaliwungu District in Figures, 2021, Brangsong District in Figures, 2021

4.4.3 Education

4.4.3.1 Level of Education

The literacy rate is the proportion of people aged 15 and above who can read and write and is an important indicator to assess how open a society is to education. The mean year of schooling is the average number of completed years of education of a country's population aged 15 years and older, excluding years spent repeating individual grades. A higher rate means a higher education level has been attained. This rate is highly linked to the school participation rate, an indicator used to measure students' access to educational facilities. A higher rate of school participation means greater opportunity to access education. The literacy rate, mean years of schooling, and the school participation rate and gender of the community in the study area are presented in **Table 4-15**.

Table 4.15 Literacy Rate, Mean Years of Schooling, and School Participation Rate

Location	Literacy Rate	Mean Years of Schooling	School Participation Rate
Kendal Regency	92.9%	7.46	<ul style="list-style-type: none"> ■ Age 7-12: 99.35%; ■ Age 13-15: 95.73%;

Location	Literacy Rate	Mean Years of Schooling	School Participation Rate
			■ Age 16-18: 72.19%.
Total number of students*		Male	Female
191,133 (100%)		99,8484 (52.24%)	22,633 (47.76%)
Level of formal education		Male	Female
Kindergarten		11,551	11,112
Elementary school		41,000	37,594
Junior High school		18,700	17,479
Senior High school		5,834	8,179
Vocational school		14,034	9,895
Other form of education		Male	Female
Islamic religious centre		147	123
Family planning school		4,367	4,209
Special education school for special needs children		832	578
Community learning centre		3,138	1,923
Language proficiency centre		175	193

Source: Regional Statistic of Kendal Regency, 2022; *: second term of 2022/2023 - Education agency of Kendal Regency

4.4.3.2 Education infrastructure

Education infrastructure is one of the main elements to support the delivery of good education in an area. Data from the report “Kendal in Figures” (2022) shows a total of 1,472 school facilities in Kendal Regency. The number of education facilities in the affected villages is presented in the **Table 4-16** below.

Table 4.16 Education Infrastructure in Study Area

Village	Primary	Junior High	Senior High	University/Academy
Kaliwungu District				
Kumpulrejo	1	N/A	N/A	N/A
Mororejo	2	1	1	N/A
Wonorejo	1	1	1	1
Brangsong District				
Brangsong	3	1	2	N/A

Source: Kaliwungu District in Figures, 2021, Brangsong District in Figures, 2021

4.4.4 Economic Profile and Livelihood

The majority of people within KIP area work as informal workers, merchant & entrepreneurship, private sector employee, and daily labour. Detail information on main occupation is shown in **Table 4-17** below.

Table 4.17 Main Occupations

Occupation	Kaliwungu District			Brangsong District
	Wonorejo	Mororejo	Kumpulrejo	Brangsong
Informal Workers	1,274	2,110	786	1,730
Merchant & Entrepreneurship	1,152	1,374	563	695
Farmer	391	511	79	211
Fishers	15	821	0	3
Daily Labour	193	330	235	1,075
Private Sector Employee	352	821	459	1,026
Public Employee & Officers	13	38	19	79

Source: Kaliwungu District in Figures, 2021, Brangsong District in Figures, 2021, Population Data and Civil Registration Of Kendal District, Semester II, 2021

The minimum monthly wage for Kendal Regency in 2022 has been fixed at IDR 2,340,312, making it the 3rd highest in Central Java province, after Semarang in IDR 2,835,021 and Demak Regency in IDR 2,513,005.

- The fish pond owners (land owner) with a size of 3.5 ha earn income from land lease around IDR 20,000,000 per year or around IDR 1,600,000/month. The land owner of these ponds usually have more than one pond in several locations.
- A fishpond tenant able to generate a net income of at least IDR. 5,000,0000 - 8,000,000 every month with a pond area of 2.5 ha. The amount of income varies greatly because it depends on the yields obtained
- A pond manager as the employer by the lessee or owner of the pond. Assigned to manage and maintain the pond every day can have an income of around IDR 1,500,000 – 2,500,000 depending on the harvest obtained.
- Informal workers in pond and pond maintenance workers can earn Rp. 70.000 – Rp. 100,000 while fish and crab hunters can earn 200,000 – Rp. 300,000 per day. Those two type of workers usually have more than one job and have uncertain incomes.

4.4.4.1 Agriculture

Agriculture activities are the business sector for some residents in Kaliwungu and Brangsong districts. Generally, the main crops are rice, secondary crops, maize, sweet potatoes and peanuts. Meanwhile, in the study area, there is only rice or paddy field farming.

The harvested area of paddy field in 2020 in Kaliwungu district is 1,163 hectares, while in Brangsong district is 2,173 hectares. The comparison of the harvested area and planted area per annum at the study location is presented in the **Table 4-18** below.

Table 4.18 Production and Production Value of Paddy Field Farming

Villages	Harvested Area (hectare)	Planted Area (hectare)	Production (ton/year) ¹⁴	Production Value (billion/year) ¹⁵
Kaliwungu District				
Kumpulrejo	91	93	518.7	2.52
Mororejo	54	55	307.8	1.50
Wonorejo	44	45	250.8	1.22
Brangsong District				
Brangsong	369	466	2,103.3	10.23

Notes: Average production per hectare is 5,7 ton, average price of rice is 4.865 per Kg
Source: Kaliwungu District in Figures, 2021, Brangsong District in Figures, 2021

4.4.4.2 Fisheries

The fishery activity is a business sector in great demand by most of the population in the study area. Generally, the production of aquaculture (in form of fish and shrimp pond and seaweed farming) in the Kaliwungu district is 7,175.9 tons/year with a production value of Rp. 195.62 billion/year. While Brangsong district is 1,685.86 tons/year with a production value of Rp. 38.33 billion/year. The production and production value in detail by the commodity is presented in the **Table 4-19** below.

Table 4.19 Production and Production Value by Commodity

Commodity	Kaliwungu District		Brangsong District	
	Production (ton/year)	Production Value (billion/year)	Production (ton/year)	Production Value (billion rupiah/year)
Milkfish	5,091.9	84.85	1,289.5	21.43
Tiger shrimp	192.8	12.15	33.5	2.12
Vannamei shrimp	1,489.0	96.88	104.9	7.31
Another shrimp	0	0	230.8	6.94
Nile tilapia	81.1	1.58	27.1	0.53
Seaweed	321.1	0.16	0	0

Source: Kaliwungu District in Figures, 2021, Brangsong District in Figures, 2021

4.4.4.3 Minimum Wage

Provincial and regency/city minimum wage is regulated through Government Regulation No. 36 of 2021 on wages. The provincial and regency/ city minimum wage is determined by few contributing economic factors such as purchasing power parity, employment, wages, economic growth and inflation. It is stated under the regulation that regency/city minimum wage must be higher than the provincial minimum wage.

The provincial government of Central Java has determined the provincial minimum wage for Central Java Province in accordance with the Governor of Central Decree No. 561/39 of 2021. The provincial

¹⁴ Secretariat General of the House of Representatives (2022), Budget Issue Brief: Industry & Development.

¹⁵ Merdeka (2022). Data BPS: Harga Beras Naik di Agustus 2022. Retrieved from: <https://www.merdeka.com/uang/data-bps-harga-beras-naik-di-agustus-2022.html> [Accessed September 2022]

minimum wage in 2022 is IDR 1,813,011, while the provincial minimum wage for Central Java in 2021 was IDR 1,798,979¹⁶, showing an increase of 0.8% in the current year.

The minimum wage for Kendal Regency in 2022 has been fixed at IDR 2,340,312, making it the 3rd highest in Central Java province, after by Semarang City in IDR 2,835,021 and Demak Regency in IDR 2,513,005.

The minimum wage in Central Java Province and Kendal Regency is presented in **Figure 4.17** below.

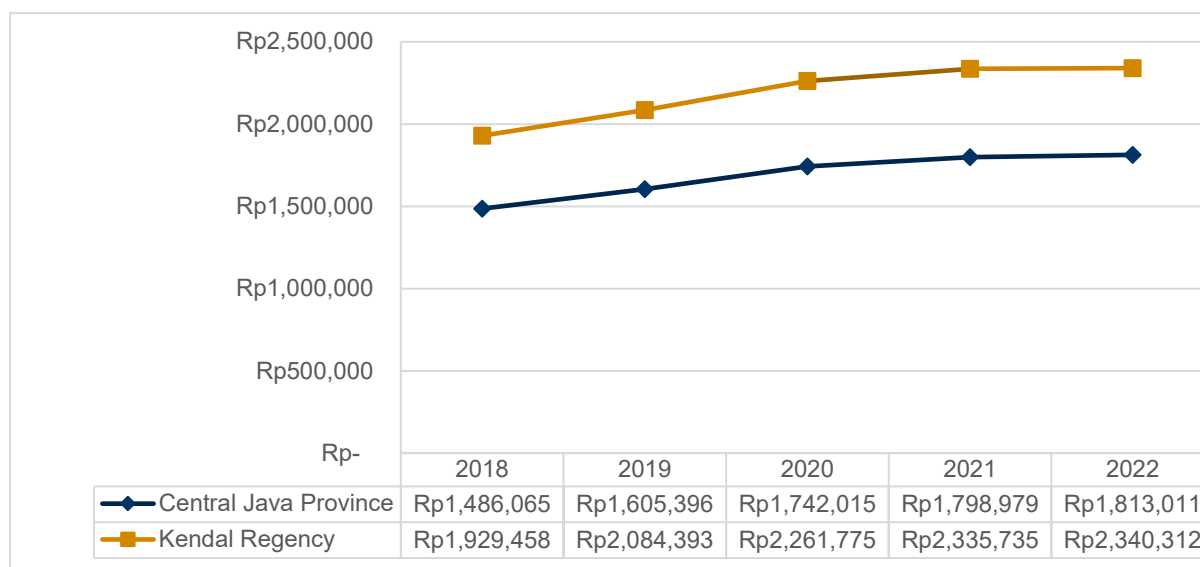


Figure 4.17 Minimum Wage of Central Java Province and Kendal Regency in 2018-2022

4.4.4.4 Income

Most of the community's income in the AoI depend on the formal sector which comes from factory workers with a minimum monthly income as per the minimum wage in Kendal Regency at the moment. **Table 4-20** below provides an overview of the average income for informal sectors. The highest average income is earned by shrimp-pond farming, followed by paddy field farming, factory workers and fish-pond farming.

Table 4.20 Income of Community in Study Area

Activity	Production cost (IDR per hectare)	Income (IDR per hectare)	Production period (month)
Fish-pond farming	8,000,000	16,000,000	5
Monthly		3,200,000	
Daily		106,667	
Shrimp-pond farming	400,000,000	900,000,000	3.5
Monthly		257,142,857	
Daily		8,571,429	

Source: Local community interview, 2022

¹⁶ Kompas. (2021). Daftar Lengkap Rincian UMK di 35 Kabupaten Kota Se-Jawa Tengah di 2021.. Retrieved from: [Daftar Lengkap Rincian UMK di 35 Kabupaten Kota Se-Jawa Tengah di 2021 Halaman all - Kompas.com](https://www.kompas.com) [Accessed September 2022]

4.4.4.5 Poverty

According to the National Statistic Agency, poverty define as the inadequate economic ability to fulfil the basic needs including food measured by the expenditure as a benchmark. Individual or the household fall under the category of a poor if the expenditure below the poverty line or equal to 2100 kilocalories and minimum needs for housing, clothing, education, and health per capita per day.

The poverty line in the Kendal Regency is slightly similar with the provincial and national standard (See **Table 4-21**). The percentage of poor household in the project Aol approximately reach 8-15% from its total population. According to the Kendal Statistic Agency data in 2019, total number of household categorized as poor household in Kaliwungu District is 1.684 and Brangsong District is 2,712 household.

Table 4.21 Poverty Line and Number of Poor in Central Java Province and Kendal Regency

Location (s)	Poverty Line (IDR/Capita/Month)			Number of Poor People					
				Total Headcount			Percentage (%)		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
Indonesia	440,538	458,947	486,168	24.79 M	27.5 M	26.5 M	9.22	10.19	9.71
Central Java Province	369,385	395,407	409,193	3.74 M	3.98 M	4.10 M	10.80	11.41	11.79
Kendal Regency	369,769	396,691	407,387	91,200	97,490	100.000	9.41	9.99	10.24

Source: Statistic data of Indonesia, 2021, Central Java in Figures, 2022

There is no exact number of the poor household has been identified at the village level. However, the cash assistance program to the vulnerable groups from central government can be referred to as the source to approximate the number of poor household and the vulnerable groups.

Ministry of Social Affairs has implemented cash assistance program (PKH). The Social Protection Program, also known internationally as Conditional Cash Transfers (CCT), has proven to be quite successful in tackling the poverty faced in these countries, especially the problem of chronic poverty. Through the program, low-income families are encouraged to have access to and take advantage of essential social services in health, education, food and nutrition, care, and assistance, including access to various other social protection programs, which are complementary programs on an ongoing basis. The detail of implemented program is presented in **Table 4-22** below.

Table 4.22 Beneficiaries of PKH Program

Village	Stage 1		Stage 2		Stage 3		Stage 4	
	Number of beneficiaries	Amount of fund	Number of beneficiaries	Amount of fund	Number of beneficiaries	Amount of fund	Number of beneficiaries	Amount of fund
Kaliwungu District								
Kumpulrejo	76	35 M	76	38 M	77	38 M	69	34 M
Mororejo	282	130 M	273	128 M	281	132 M	272	136 M
Wonorejo	373	180 M	375	194 M	385	190 M	355	178 M
Brangsong District								
Brangsong	422	203 M	394	199 M	375	191 M	346	178 M

Source: Kaliwungu District in Figures, 2021, Brangsong District in Figures, 2021

4.4.5 Ethnicity, Religion, and Cultural Values

4.4.5.1 Ethnicity and Local Language

In general, people within the study belong to the Javanese ethnic group. Based on the observation and community interviews during the site visit, local communities use Javanese language and Bahasa Indonesia for daily communication. According to the research by Lestari (2017) there are several Javanese dialects in Kendal Regency depending on the location: Semarsuradipati dialect for the east, Pekalongan dialect for the west, and Wonosobo dialect for the south¹⁷.

4.4.5.2 Religion

The Central Bureau of statistics has classified religions into six (6) categories; Islam, Christianity, Catholicism, Buddhism, Hinduism, Konghucu, and others¹⁸. Though secondary data collection and key informant interviews, ERM identified that people residing within the study area are predominantly Muslim, with a small percentage of Christians, Catholics, Buddhists, and Hindus. **Table 4-23** below presents the detailed number of people and the religion in study area. According to the data, around 99.95% of the residents in the study area are Moslem.

Table 4.23 Number of People and Religion in Study Area

Village	Islam	Christianity	Catholicism	Buddhism	Hinduism	Konghucu	Other
Kaliwungu District							
Kumpulrejo	2,928	0	0	0	0	0	3
Mororejo	7,102	3	2	0	0	0	0
Wonorejo	4,343	2	0	0	0	0	0
Brangsong District							
Brangsong	6,833	0	1	0	0	0	0

Source: Kaliwungu District in Figures, 2021, Brangsong District in Figures, 2021

Detail on the number of worship facilities is presented in **Table 4-24** below.

Table 4.24 Place of Worship in Study Area

Village	Mosque	Mushola	Church	Buddhism	Vihara	Temple
Kaliwungu District						
Kumpulrejo	2	12	0	0	0	0
Mororejo	5	18	0	0	0	0
Wonorejo	3	16	0	0	0	0
Brangsong District						
Brangsong	3	26	0	0	0	0

Source: Kaliwungu District in Figures, 2021, Brangsong District in Figures, 2021

¹⁷ Menik Lestari (2017). Varieties of Java's Dialect om Lemda; Regency: Dialectology Research. Thesis. University Indonesia.



¹⁸ Central Bureau of Statistics. Glossary. Retrieved from: https://www.bps.go.id/istilah/index.html?Istilah_sort=keyword_ind [Accessed September 2022]

4.4.5.3 Cultural Resources and Practices

The influence of Islam is very strong in Kendal Regency. One of the indications for this are that many Islamic boarding schools are in this area, which caused Kendal Regency to be known as the *Santri City*. Kaliwungu District is one of the locations known for the *haul* tradition which is held annually (a week after the Eid Al Fitri) at the grave of the religion figure K.H. Asy'ari or *Kyai Guru*. The haul is a pilgrimage tradition of Islam-Java. This tradition can be recognized as a potential intangible cultural heritage.

Based on preliminary study in the Project area, two potential tangible cultural heritage sites were identified in the surrounding area which marked with *haul* as form of cultural practice. Potential cultural heritage sites in the study area are presented in the **Table 4-25** below.

Table 4.25 Cultural Heritage Around the Project Area

Name	Location	Picture
Nyai Ageng Dewi Rosowati or Nyai Markam	<p>Village: Wonorejo village</p> <p>District: Kaliwungu district</p> <p>Coordinate: 6°55'55.0"S 110°15'19.2"E</p> <p>Distance to the Project location: 2,49 km</p>	
Mbah Cokro	<p>Village: Kumpulrejo village</p> <p>District: Kaliwungu district</p> <p>Coordinate: 6°57'10.0"S 110°13'36.5"E</p> <p>Distance to the Project location: 6,36 km</p>	

Source: Field observation, 2022

4.4.6 Social Infrastructure and Services

4.4.6.1 Healthcare Services

Health facilities in the study area include maternity hospitals, community health centres, integrated healthcare centres, pharmacy, and clinics. The number of health facilities in villages of Kaliwungu and Brangsong districts is presented in **Table 4-26** below.

Table 4.26 Health Facility in Study Area

Village	Hospital	Community Health Centre	Maternity Hospital	Clinic	Integrated Healthcare Centre	Village Health Centre	Pharmacy
Kaliwungu District							
Kumpulrejo	0	0	0	0	4	1	0

Village	Hospital	Community Health Centre	Maternity Hospital	Clinic	Integrated Healthcare Centre	Village Health Centre	Pharmacy
Mororejo	0	0	0	0	7	1	0
Wonorejo	0	0	0	0	6	1	0
Brangsong District							
Brangsong	0	1	0	0	8	1	0

Source: Kaliwungu District in Figures, 2021, Brangsong District in Figures, 2021

According to data obtained, as of 2022, a total of 5 health facilities existed in Kumpulrejo area, 8 health facilities in Mororejo area, 7 health facilities in Wonorejo and 10 health facilities in Brangsong area.

The presence of professional health practitioners in health facilities is also an important indicator of communities' access services as it will directly affect the accessibility, reactivity, and costliness of such services. **Table 4-27** below presents the number of health personnel in study area.

Table 4.27 Health Practitioners in the Study Area

Village	Doctor	Nurse	Midwife
Kaliwungu District			
Kumpulrejo	2	7	3
Mororejo	2	8	2
Wonorejo	0	0	3
Brangsong District			
Brangsong	0	2	1

Source: Kaliwungu District in Figures, 2021, Brangsong District in Figures, 2021

4.4.6.2 Community health

Life expectancy can be used to gauge the community health status. The life expectancy of the population within the Project Area based on statistic record is presented in **Table 4-28**.

Table 4.28 Life Expectancy of Population in the Study Area

Location	Life Expectancy (Years) in 2020
Indonesia	73,5
Central Java Province ¹⁹	74,6
Kendal Regency	74,4

Source: Statistic of Indonesia, 2021 and Kendal Regency in Figure, 2021

The life expectancy in Kendal Regency is similar to the overall life expectancy of Central Java Province. Low life expectancy is usually linked with the condition of public health and nutritional adequacy of the community. The Health Profile of Cilegon City report (2019) also recorded the pattern of the 10 most common diseases in patients at the community health centre shows that cases of

¹⁹ ANTARA (2021). BPS: Angka Harapan Hidup Penduduk Jawa Tengah Capai 74,57 Tahun. Retrieved from [BPS: Angka harapan hidup penduduk Jawa Tengah capai 74,57 tahun - ANTARA Jateng \(antaranews.com\)](https://www.antaranews.com/berita/1107666/angka-harapan-hidup-penduduk-jawa-tengah-capai-74-57-tahun). [Accesed September 2022]

Upper Respiratory Tract Infection (ISPA) are still the highest in Kendal Regency with 140,305 sufferers. **Table 4-29** below provides overview of the top 10 diseases in the Kendal Regency.

Table 4.29 Top 10 Diseases Recorded in Kendal Regency in 2018

Disease	Total Cases
Acute upper respiratory infections of multiple and unspecified sites	140,305
Hypertension	41,787
Influenza	37,966
Cough	34,858
Dermatitis & Eczema	23,738
Arthritis	21,850
Cephalgia	20,045
Diarhea & other intestinal bacterial infections	18,758
Diabetes mellitus	17,497
Stomach disease dan duodenum	16,112

Source: Health Agency of Kendal Regency, 2019

Based on the data in Health Profile of Kendal Regency (2019), several diseases have been observed in the area categorized as infectious diseases (i.e., tuberculosis, pneumonia, HIV-AIDS, and leprosy). For specific cases of Tuberculosis, the Case Notification Rate (CNR) in 2018 was 107.8 per 100,000 population, a decrease compared to 2017 which was 118.0 per 100,000 population.

Findings of HIV cases in Kendal Regency were 59 cases. As for AIDS cases, there were around 60 cases, up from 2017 as many as 59 cases, and cases of deaths caused by HIV/AIDS increased in 2017 from 40 cases to 44 cases in 2018. Mostly HIV/AIDS sufferers are of productive age.

Populations that are susceptible to pneumonia are children aged less than 2 years, the elderly and people who have health problems. Based on the record of finding pneumonia under five in Kendal Regency for 2018 there was a significant downward trend compared to 2017, down to 10.69% in 2018 from 41.42% in 2017.

STAKEHOLDER ENGAGEMENT

This section provides a comprehensive stakeholder engagement and grievance redressal plan that can be used as reference for the Client to develop such plan for the Project. A simpler version of the plan is still considered appropriate for the Project taking into account that it is located in the industrial park.

5.1 Introduction

This section serves as a stakeholder engagement living document to undertake preliminary stakeholder identification and analysis with stakeholder mapping. It will provide guideline to manage effective and meaningful engagement with stakeholders. It is focused on guiding interaction and communication with international, national, regional, and local stakeholders concerned about the development of the Project and related studies, interested in the Project, and potentially affected by the Project, while setting the stage for future engagement during the subsequent development, operation, and closure phases.

Refer to the ALBA Group's Stakeholder Engagement Plan Document, 'Stakeholders' can be defined as persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholders may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests, the academic community, or other businesses.

Stakeholder mapping and analysis shall continue to be reviewed and refined as a better understanding of key influential and interested stakeholders is achieved and new stakeholders are identified during the process of project refurbishment and operations in Kendal.

5.1.1 Objectives

The Project team shall be committed to undertaking a process that delivers an inclusive dialogue with Project stakeholders. The objectives of the Stakeholder Engagement include:

- Assist the Project in developing a stakeholder engagement strategy that complies with national and international requirements including undertaking meaningful consultation with all key stakeholders to discuss relevant project information and seek timely feedback;
- To identify and map key project stakeholders and understand issues/concerns including NGO and community opinions and suggestions;
- Assist the Client in managing stakeholder risks (such as community misperceptions or concerns), demonstrating meaningful engagement in terms of building and maintaining stakeholder relationships and providing a two-way channel for information sharing and communication; and
- Establishing and implementing an effective grievance redress mechanism for the impacted communities and broader stakeholders that ensure the timely response and close out of genuine grievances.

5.2 Regulations and Requirements

The Project shall be committed to upholding all applicable laws and regulations of the Government of Indonesia as well as international regulations. The applicable regulations for stakeholder engagement and disclosure activities are summarized below.

5.2.1 National Law and Regulation

The Indonesian regulatory standards detailed in **Table 5-1** are applicable to developing an ESIA/AMDAL for a Project. According to GR No. 22 of 2021 Article 10, KIP, as the industrial park, holds the responsibility to develop ESIA; tenants of the industrial park are required to submit Detailed

Environmental Management and Monitoring Plan (*RKL-RPL Rinci*) referring to the ESIA/AMDAL of the industrial park. ALBA activity plans are categorized as ESIA/ AMDAL exception as they are in an industrial park and Special Economic Zone.

Table 5.1 National Regulation Framework for Stakeholder Consultation and Information Disclosure

Regulation	Content	Source
Law No 32 of 2009 about “Environmental Protection and Management.”	Chapter XI details expectations associated with community participation. The community has equal rights and opportunities to actively participate in and protect the environment as well as part of the planning and implementation of environmental protection and management.	Articles No. 70 Paragraph 1
Law No. 11 of 2020	There have been several updates of environmental regulations during the period of 2020-2021 following the issuance of Act no 11 of 2020 on Job Creation, one of the key updates were the issuance of Government regulation no 22 of 2021 on the implementation of environmental protection and management. Regarding affected community involvement during EIA study describe in article 26 paragraph 3 with further explanation in Government Regulation No. 22 of 2021.	Article 26 Paragraph 3
<i>Government Regulation No. 22 of 2021</i> on implementation of protection and environmental management	<ul style="list-style-type: none"> ■ Development of ESIA/AMDAL is exempted for business and/or activity plans located in a regulated industrial area instead it is required to develop detailed RKL-RPL with reference to the EIA and Environmental Approval of Industrial Area; <p>In preparing the Regulatory EIA / AMDAL, the Project Initiator should include the following parties in the process:</p> <ol style="list-style-type: none"> 1. Affected communities; and 2. Environment observer, researcher, and NGOs²⁰. <p>The affected communities including vulnerable group, indigenous people, and consideration of gender representative;</p> <p>Community / public participation as intended in above paragraph are done through announcement of Business and / or activity plan and public consultation;</p> <p>Community / public participation shall be made before the preparation of EIA / AMDAL Term of Reference; and</p> <p>The community shall be entitled to submit suggestions, opinions, and responses to the business and / or activity plan within 10 working days since the announcement as referred to point no 2 above.</p>	Article 10 Article No. 28 Paragraph 1 - 7 Article No. 29 Paragraph 1 – 2 Article 32

²⁰ Defined as the individual or group who have concern with the environmental impact and communities affected by the project

Regulation	Content	Source
<p>Regulation of the State Minister for Environment No. 17/2012 regarding Guidelines for Community Involvement in the Process of Environmental Impact Assessment and Environmental Permit</p>	<p>This regulation acts as guarantee and guideline for the implementation of community involvement in the process of environmental impact assessment and environmental permit;</p> <p>Stated that the mandatory notification should be using 2 mandatory media i.e.:</p> <ol style="list-style-type: none"> 1. Printed media such as local newspaper and/ or national newspaper (if required by EIA assessment authority; and 2. Bulletin board which is easily accessible to the affected communities. <p>In addition to mandatory media as mentioned above, the Project could use other supporting media to undertake notification such as:</p> <ol style="list-style-type: none"> 1. Printed media such as brochures, pamphlet, or banner; 1. Electronic media such as television, website, social network, short message service (SMS), and/ or radio; 2. Bulletin board in environmental agencies and relevant government agencies in national, province and regency level; and 3. Other media which can be used. <p>In addition, this regulation also mention that the notification should be conveyed through multimedia which is effectively accessible to the community such as website and bulletin board in the Project plan location which easily to reach by the affected community.</p>	<p>Chapter II: Part B, point b</p> <p>Chapter III: Part B, point 1.b</p>
	<p>Guidance of community involvement in the process of environmental impact and environmental permit analysis is intended as a reference:</p> <ol style="list-style-type: none"> 1. The implementation of community involvement in the environmental impact analysis process; and 2. Implementation of community involvement in the environmental permit process. <p>Implementation of community involvement in the EIA and Environmental Permit Process shall be based on the following basic principles:</p> <ol style="list-style-type: none"> 3. Providing transparent and complete information; 4. Equality of positions among the parties involved; 5. Fair and wise problem solving; and 6. Coordination, communication and cooperation among the parties concerned / involved. 	<p>Article No 1 and 2</p>
<p>Regulation of the Minister of Industry</p>	<p>Community socialisation regarding project planning</p>	<p>Attachment: Letter A-2</p>

Regulation	Content	Source
of the Republic of Indonesia No. 1 of 2020 concerning Development of a Detailed Environmental Management Plan and Environmental Monitoring Plan for Industrial Companies that are or will be located in Industrial Area		

5.2.2 International Standard

Project is assessed against the following standards and guidelines, in addition to the applicable Indonesian and local legislation, regulations and standards:

- World Bank Group/IFC EHS as well as the applicable sector specific Guidelines
- International Covenant on Economic, Cultural and Social Rights and relevant ILO Core Labour Standards Conventions; and
- Other relevant good industry practice guidelines and related documents.

5.3 Project Stakeholders

The stakeholder identification and analysis process will form the foundation for planning and designing of subsequent stakeholder engagement activities. The Project's stakeholders and analysis will be reviewed and refined regularly as the Project become more detailed and definite.

A stakeholder is defined as individuals, communities, groups and institutions who:

- Are most likely to experience, at significant levels, any potential negative and / or positive impacts of the proposed Project;
- Have the mandate over the various elements of the project's activities (such as Government institutions, NGOs, etc.); and
- Are considered vulnerable members of the community within the proposed project area.

The Project stakeholders were determined during Social Compliance Audit and socio-economic baseline study. Qualitative research approaches (interviews with key informants) were used to collect data on relevant stakeholder / stakeholder groups and their associated issues and perceptions on the Project.

5.3.1 Overview of Project Impacts

An overview of significant adverse impacts anticipated include:

- Potential negative impacts on the physical environment, particularly air quality and noise impacts during construction and operation of the Project facilities;
- Disturbance to local traffic resulting in an increased risk for community safety, associated with the Project construction's mobilisation of vehicles and heavy equipment, as well as waste supplies trucks during operation which may traverse settlement areas along local roads; and

- Impacts on community perceptions due to high concern and expectations from local communities and stakeholders, while lack of knowledge regarding the Project efforts in managing potential adverse impacts as well as its benefits for waste management in Kendal. This may also result in disturbance to community security e.g., tension leading to public protest or demonstrations.

5.3.2 Preliminary Stakeholder Identification and Analysis

The following section presents preliminary stakeholder identification and analysis. **Table 5-2** shows the mapping matrix; a dynamic tool that should be periodically updated as and when interest and/or influences of each stakeholder changes over the Project implementation period. The stakeholder influence and interest level can be used to determine what type of engagement the project would need to approach.

The stakeholders are prioritized based on the following analysis:

- Influence:** this refers to the power stakeholders have over the Project, including the ability to affect or influence decisions and facilitate its implementation
- Importance:** this refers to the priority given by the Company considering and accommodating the stakeholders' needs and interest; and
- Attitude or Perception:** this refers to the attitude or perception of the stakeholders towards the project ie. Opposed, neutral or positive

Figure 5.1 below illustrates the stakeholder engagement approach based on influence and importance level with reference to ALBA Group Stakeholder Engagement Plan document .

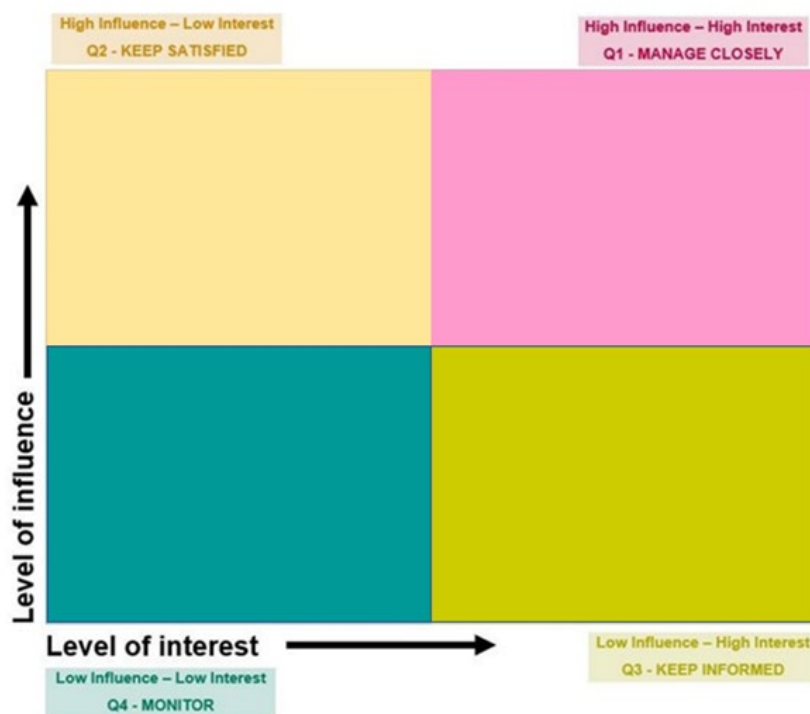


Figure 5.1 Stakeholder Engagement Approach

Based on Figure 5-1, there will be four (4) different approach for the identified stakeholder based on the level of prioritisation process where it will determine the level of engagement with each stakeholder based on their position in the quadrant:

1. **Q4 – Partner/ Manage Closely:** This approach is applied for the stakeholder with a high influence and high importance. For example, the impacted community/vulnerable groups that need to be involved and partner with the project given the potential level of impact and risk. If stakeholder's expectation e.g., related to work opportunity are not met, social unrest/project delays may occur. Therefore, these stakeholders should be consulted with regularly and in a variety of different ways.
2. **Q3 – Consult/ Keep Satisfied:** this approach is applied to stakeholders with medium to high influence and importance. The project is required to consult with these stakeholders through regular engagement on issues of interest and possibly seek consent. The frequency would be determined by the stakeholder and project progress.
3. **Q2 – Involve/Engage – Keep Informed:** this approach is applied to stakeholders with high importance but low to medium influence. In addition to seeking stakeholder consent, the project is to involve this stakeholder throughout the project development phase. The level of involvement will focus on key interest area should be consulted. For example, the regional government/agency has a high influence due to its legal and formal position in the Provincial Government/agency level. However, these stakeholders do not hold a high importance through the project, except only during approvals. Nonetheless, they need to be kept informed on the progress of the project.
4. **Q1 – Inform/Monitor** – this approach is used for stakeholders who have a low to medium influence with low to medium importance. These stakeholders will need to be informed on the activities of the project (e.g., via email/website, media); unlikely to seek/require their consent to progress with the project.

Table 5.2 Preliminary Stakeholder Identification and Analysis

No.	Stakeholder Group	Stakeholder Identification	Importance	Power of Influence	Perception
1	Developers and Industrial Park	<ul style="list-style-type: none"> ■ PT Jababeka Tbk ■ Sembcorp Development Ltd. (Singapore) ■ Kendal Industrial Park 	<p>High Importance Project to contribute to growth and economic development of KIP and local regency.</p>	<p>High Influence As the developers of KIP and the industrial park, they have high influence over their tenants.</p>	<p>Positive Supportive, the Project will contribute to KIP objectives as a regional development program. As long as the Project is well communicated and meets the regulations, it will bring economic development for the local area.</p>
2	Neighbouring Industries	<p>Neighbouring industries within Kendal Industrial Park include:</p> <ul style="list-style-type: none"> ■ PT Solunova Alami Indonesia ■ PT Nusa Raya Cipta ■ PT Goldensnack Mas Sejahtera ■ PT Rumah Masa Depan ■ PT BSN Technologies Indonesia 	<p>Medium Importance Environmental protection Health and safety aspects</p>	<p>Medium Influence Neighbouring industries could be affected during Project development phase i.e. construction, as well as access road during operations.</p>	<p>Neutral to Positive Supportive to the Project as long as they will not be negatively impacted e.g., access road and operation of respective companies.</p>
3	Direct Community Representatives	<ul style="list-style-type: none"> ■ Youth Organisation (Karang Taruna) ■ Women's Group (<i>Pemberdayaan Kesejahteraan Keluarga</i> PKK) 	<p>Medium Importance Project to contribute to the local / village social and economic development through providing opportunity for local workforce and social investment Programs.</p>	<p>Medium Influence Formal position as government-affiliated groups and usually engaged by the Project in relation to social investment, labour issues and general community engagement.</p>	<p>Positive Supportive, the Project will contribute to KIP objectives as a regional development program. As long as the Project is well communicated and meets the regulations, it will bring economic development for the local area.</p>
4	Local Communities	<p>Residential villages are identified around the industrial park.</p> <ul style="list-style-type: none"> ■ Kaliwungu District <ul style="list-style-type: none"> ■ Wonorejo Village 	<p>High Importance Employment Environmental protection Health and safety aspects</p>	<p>Medium Influence This stakeholder group is wide encompassing a broad range of people</p>	<p>Neutral Supportive to the Project as long as they can receive benefits. Otherwise, communities tend to oppose the Project.</p>

No.	Stakeholder Group	Stakeholder Identification	Importance	Power of Influence	Perception
		<ul style="list-style-type: none"> ■ Monorejo Village ■ Kumpulrejo Village ■ Krajankulon Village ■ Sarirejo Village ■ Karangtengah Village ■ Brangsong District <ul style="list-style-type: none"> ■ Brangsong Village ■ Purwokerto Village 		<p>largely those residing near the KIP area. However, these communities might experience negative impacts that include disturbance to community e.g., due to increased traffic and use of public roads. Potential impact also includes minor dust, foul odour and noise disturbance.</p>	
5	Vulnerable Groups	<ul style="list-style-type: none"> ■ Workers of Third Parties Supplier ■ Affected Persons ■ Women headed household (HH) ■ Women from low income HH ■ Elderly households with no economic support ■ Children and youth ■ Disabled ■ HH with income below poverty line 	<p>High Importance</p> <ul style="list-style-type: none"> ■ High expectation on the resettlement and compensation process ■ High expectation on the employment opportunity 	<p>High Influence</p> <p>If resettlement compensation issues occur, they could lead to social unrest and may delay the Project's construction.</p>	<p>Positive</p> <p>Supportive towards the Project as long as the particular community are well consulted, received fair compensation from the Project.</p> <p>However, this may change if communication is unclear and fair compensation is not provided.</p>
6	Third Party Suppliers	<p>Project operations will require third-party supplier for provision of recycling material (i.e. plastic). Identified suppliers so far include:</p> <ul style="list-style-type: none"> ■ Supplier A ■ Supplier B ■ Supplier C ■ Supplier D 	<p>High Importance</p> <ul style="list-style-type: none"> ■ Employment ■ Environmental protection ■ Health and safety aspects 	<p>High Influence</p> <p>All Third-Party Suppliers will be supporting the supply chain of the ALBA-Tridi facility, Quality, quantity, and continuity of plastic waste supply from suppliers can</p>	<p>Positive</p> <p>Supportive towards the project and will be focusing more on the operational agreement between the Client and suppliers based on Supplier Code of Conduct.</p>

No.	Stakeholder Group	Stakeholder Identification	Importance	Power of Influence	Perception
		The Project has identified 22 suppliers at the moment, however this could increase based on further development of the facility.		affect the production capacity of the Client	
7	Central Government	<ul style="list-style-type: none"> ■ Ministry of Environment and Forestry ■ Ministry of Investment 	<p>Medium Importance</p> <ul style="list-style-type: none"> ■ To become an ad-hoc partner for the Project to fulfil government requirements on administration and RKL-RPL reporting ■ Project to contribute in the development of local economy whilst adequately managing its environmental and social issues. 	<p>High Influence</p> <p>Legal and formal position in the Central Government level.</p> <p>Through the Environmental Agency, they have the authority to monitor Project environmental and social performance based on RKL-RPL. Should any non-compliance occur the Government has the authority to stop all activities related to the Project.</p>	<p>Positive</p> <p>Supportive, the Project will contribute to KIP objectives as a regional development program. As long as the Project is well communicated and meets the regulations, it will bring economic development for the local area.</p>
8	Provincial/ Municipality Government and Agency	<ul style="list-style-type: none"> ■ Provincial Government of Central Java Province ■ Environmental Agency (DLHK) of Central Java Province ■ Investment Board One-Stop Service (DPMPTSP) of Central Java Province 	<p>Medium Importance</p> <ul style="list-style-type: none"> ■ To become an ad-hoc partner for the Project to fulfil government requirements on administration and RKL-RPL reporting ■ Project to contribute in the development of local economy whilst adequately managing its environmental and social issues. 	<p>High Influence</p> <p>Legal and formal position in the Central Government level.</p> <p>Through the Environmental Agency, they have the authority to monitor Project environmental and social</p>	<p>Positive</p> <p>Supportive, the Project will contribute to KIP objectives as a regional development program. As long as the Project is well communicated and meets the regulations, it will bring economic development for the local area.</p>

No.	Stakeholder Group	Stakeholder Identification	Importance	Power of Influence	Perception
				performance based on RKL-RPL. Should any non-compliance occur the Government has the authority to stop all activities related to the Project.	
9	Local Government Agencies	<ul style="list-style-type: none"> ■ Environmental Agency (DLH) of Kendal Regency ■ Investment Board One-Stop Service (DPMPTSP) of Kendal Regency <p>Kaliwungu District</p> <ul style="list-style-type: none"> ■ Wonorejo Village Government ■ Monorejo Village Government ■ Kumpulrejo Village Government ■ Krajankulon Village Government ■ Sarirejo Village Government ■ Karangtengah Village Government <p>Brangsong District</p> <ul style="list-style-type: none"> ■ Brangsong Village Government ■ Purwokerto Village Government 	<p>High Importance</p> <ul style="list-style-type: none"> ■ To become an ad-hoc partner for the Project to fulfil government requirements on administration and RKL-RPL reporting ■ Project to contribute in the development of local economy whilst adequately managing its environmental and social issues. 	<p>High Influence</p> <p>Legal and formal position in the Central Government level.</p> <p>Through the Environmental Agency, they have the authority to monitor Project environmental and social performance based on RKL-RPL. Should any non-compliance occur the Government has the authority to stop all activities related to the Project.</p>	<p>Positive</p> <p>Supportive, the Project will contribute to KIP objectives as a regional development program. As long as the Project is well communicated and meets the regulations, it will bring economic development for the local area.</p>

No.	Stakeholder Group	Stakeholder Identification	Importance	Power of Influence	Perception
10	Local Level Non-Governmental Organisation	NGO United Coalition of Kendal JARAK	<p>High Importance</p> <ul style="list-style-type: none"> ■ Expectation that the project will prioritize local employment; ■ Proportional division of opportunities (such as security force labour and community development program) between local youth and opportunities for NGOs and CSOs to participate in the project as organization ■ Concern regarding environmental impacts ■ Suggestion for involvement of NGOs and CSOs from surrounding areas 	<p>High Influence</p> <p>Local organizations are quite active in the sub-district in their respective activities. These organizations have a large potential to influence youth or other communities' attitude towards the project.</p>	<p>Conditional</p> <p>Supportive to the Project as long as they can see that the Project benefit surrounding community and pay serious attention to environment. Otherwise, they might influence communities to oppose the Project.</p>
11	International Organisations	<ul style="list-style-type: none"> ■ International Labour Organisation (ILO) ■ International Organisation of Migration (IOM) 	<p>Medium Importance</p> <ul style="list-style-type: none"> ■ Expectation that the project will prioritize local employment and comply with all applicable labour regulations 	<p>Medium Influence</p>	<p>Positive</p> <p>Supportive to the Project as long as all labour standards are complied with.</p>
12	Labour Union	<ul style="list-style-type: none"> ■ <i>Serikat Buruh Sejahtera Indonesia</i> (Indonesian Welfare Labour Union/ SBSI) ■ <i>Serikat Pekerja Seluruh Indonesia</i> (All Indonesia Trade Union/ SPSI) ■ APINDO Kendal Regency (Indonesian Employers Association) 	<p>Medium Importance</p> <ul style="list-style-type: none"> ■ Expectation that the project will prioritize local employment ■ Concern regarding environmental impacts 	<p>Medium Influence</p> <p>KIP has not established their own labour union, and not many workers in the area are part of a labour union. These unions would have a large potential to influence youth or other communities' attitude towards the Project, as</p>	<p>Positive</p> <p>Supportive towards the Project as long as workers are provided with the expected treatment and benefits according to national regulations.</p>

No.	Stakeholder Group	Stakeholder Identification	Importance	Power of Influence	Perception
				well as provide support for workers to know and exercise their rights.	

5.3.3 Identification of Vulnerable Groups

Stakeholder identification and engagement also seeks to identify any potentially vulnerable or disadvantaged individuals and groups in the impacted communities. Vulnerable groups are those who may be differently or disproportionately affected by the Project, or whose situation may mean that special care is needed to engage them in consultation and disclosure activities.

Based on the site survey at Project location, the following categories have been identified as vulnerable as shown in the **Table 5-3** below.

Table 5.3 Identification of Vulnerable Groups

Stakeholder	Description
Workers of Third Parties Supplier	Elderly workers in the third-party supplier
Affected Persons	Informal workers of Fish-Shrimp Pond Fish-Crab Catcher
Women	Most vulnerable women include: <ul style="list-style-type: none"> ■ Women headed household (HH); and ■ Women from low income HH
Elderly	HHs of elderly above 65 with no economic support
Children & Youth	They are vulnerable due to lack of their ability to influence decisions affecting their lives
Disabled	They are vulnerable due to lack of their physical ability to access services and opportunities
Poor HHs	Poor HHs are defined by the Government as those who have an average monthly per capita expenditure below the poverty line. Poor HHs could be identified from the cash assistance program beneficiaries by Village Government

It should be anticipated that the industrial park and/or the Project may have further adverse impacts on vulnerable groups. Women-headed household, elderly and illiterate people may have more difficulties in taking part in relevant discussions and processes during the stakeholder engagement activities. Furthermore, they are more prone to be taken advantage of by opportunistic people during the expropriation process. In addition, it may be harder for vulnerable groups to restore their livelihood after loss of lands, especially when they are depended on the land as their main source of livelihood generation.

For the third-party suppliers, vulnerability issues will mainly be focused more on the potential involvement of any child and forced labour, and also elderly workers along the supply chain from the smallest scale waste picker/scavengers until the operational flow of the supplier facility. Involvement of such vulnerable groups could happen due to socio-economic condition and education level of household.

5.3.4 Stakeholder Mapping

In order to clearly develop a systematic and effective means of engagement, stakeholders are mapped. Once identified, stakeholders are assessed based on their anticipated degree and topics of interest, as well as their role in processes which may affect activities. Their feedback is then analysed to understand their key issues, comments and concerns about the Project.

To support the analysis of stakeholders and help develop an appropriate approach for engagement, the following additional information was recorded, and stakeholders are mapped based upon:

- **Influence** on the Project (high, medium, low); and
- **Importance for and impact** on the Project (high, medium, low).

Influence refers to the power that the stakeholders have in relation to decisions either taken by or affecting the Project. This power may be in the form of stakeholders that have formal control over the decision-making process, or it can be informal in the sense of protesting against, blocking or allowing Project operations to continue.

It is also important to map those stakeholders whose interests determine them as stakeholders, i.e., may be directly involved with the Project or have something to either gain or lose because of Project implementation. Understanding stakeholder level of interest can help clarify the motivations of different actors and the ways in which they might be able to influence the Project.

Impact refers to the consequences for the stakeholder of undertaking the Project in relation to their environment, socio-economic and cultural context. The level of impact also influences affected stakeholder's interest in the Project; the higher the level of impact, the higher the interest in the way impacts are being addressed.

It should be noted that the positions of stakeholders may change over time as the Project progresses and that the stakeholder map should be reviewed and updated as appropriate. In addition, any new stakeholders identified should be added into the map.

Based on the preliminary identification of key stakeholders, the stakeholder mapping results is presented in **Figure 5.2** below.

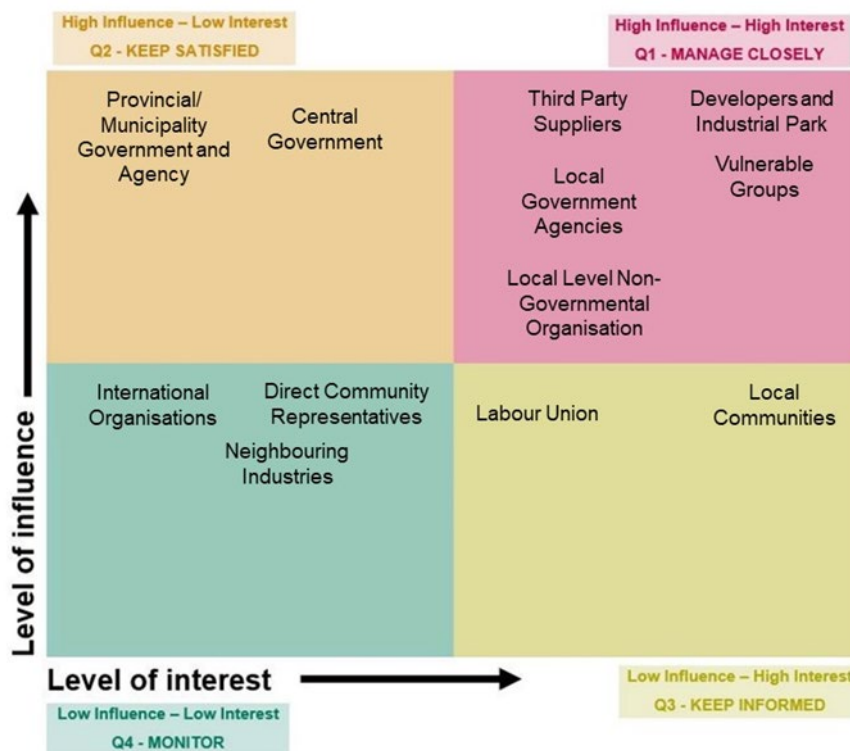


Figure 5.2 Stakeholder Mapping Results

5.4 Key Findings and Strategies

5.4.1 Stakeholder Engagement Key Findings

Table 5-4 summarises the key questions raised during site surveys. These can be considered for future engagements and programs.

Table 5.4 Summary of Key Question during site survey

Topics	Concerns
Employment Potential	Concerns were raised related to employment and training opportunities for local communities, in which village government at times were not aware such things were available.
Stakeholder engagement	Concerns were raised related to timely processes for KIP to respond to community grievances
Social investment/ CSR program	Concerns were raised related to the reach, relevancy and maintenance of CSR programs.
Community health and safety	Concerns were raised by the community related to coastal flooding issues that impacted community health and activity in general
Community grievance	Community grievances are normally related to employment opportunities and coastal flooding issues
Third Party Supplier	Concerns related to business and operational agreement with ALBA-Tridi includes capacity required, material required, payment mechanism, and compliance to supplier code of conduct for labour and working condition

A Project specific Stakeholder Engagement Plan (SEP) document will be developed as part of the Project's specific ESMS and will be implemented on the Project activities as required by AGA Corporate ESMS. The Project specific SEP will be readily available prior to the commencement of construction activities. The suggested step and approach to develop Project's information disclosure planning and communication procedure is depicted in **Appendix E**.

5.5 Grievance Redress Mechanism

An effective stakeholder engagement process can help to prevent grievances. However, projects with any potential for environmental and social impacts to occur, often result in grievances from stakeholders.

This section provides a framework for the grievance redress mechanism (GRM) that will be used to identify, track, and manage grievances raised by external Project stakeholders. The GRM applies to potential impact related with, but not limited to land acquisition and/or community engagement related grievances (construction disturbance, odour, noise, waste transportation, and water damage). A separate grievance mechanism will be developed to address internal grievances relating to employment matters.

The GRM will be refined during SEP development and be maintained throughout the Project lifecycle, to ensure that grievances are promptly heard, analysed and, to the extent possible, resolved.

The main objective of the grievance mechanism is:

- To address grievances promptly and effectively, in a transparent manner resulting in fair, effective and lasting outcomes
- To provide a grievance management process that is culturally appropriate and readily accessible to all Project affected parties
- To build trust as an integral component of the Project community relations activities
- To enable a systematic identification of emerging issues facilitating correcting actions and pre-emptive engagement.

Grievance Redress Mechanism specific for the Project will be developed based on the ALBA's ESMS as well as ALBA's document no 04 – Staff Grievance Mechanism Rev 2.0 and document no 30 – External Grievance Redress Procedure Rev 2.0.

The proposed method and approach for Grievance Procedure is described in **Appendix F**.

5.6 Stakeholder Engagement Database

Implementation of the SEP will adopt the established Stakeholder Engagement Plan. The system is a tool that can be used to track stakeholder activities and grievances and report on them. The system will help track the following information:

- The stakeholder – i.e., an organisation or individual
- A contact person's name and position or title
- Contact details (address, telephone, email, website)
- Stakeholder group(s)
- Stakeholder analysis results including potential impacts by the Project, level of stakeholder importance, influence, key interests etc
- Details of engagement activities – i.e., date, location, attendees and key issues raised – and responses/actions agreed
- Grievances and how the Project has responded to them including responses, corrective actions, responsibilities, final decision, communication on proposed resolution and agreement, due dates, closed dates, etc.

The outputs from the stakeholder mapping process (Sub Section 5.3.4) will be captured in the stakeholder database as well as the outputs from the engagement activities described above. This will help ensure that issues and concerns are captured and can be fed into decision-making process and that commitments tracked over time ensuring that they are met.

5.7 Monitoring Procedure and Assessment Reporting

5.7.1 Monitoring of Stakeholder Engagement Activities

Monitoring the stakeholder engagement activities is important to ensure that consultation and information disclosure efforts are effective, and in particular, that stakeholders have been meaningfully consulted throughout the process. Monitoring also allows the Project to improve its strategies by using rigorous information acquired from the monitoring activities.

The Project will implement an Environmental and Social Management Plan (ESMP); this will be used as a platform to monitor the stakeholder engagement activities, particularly the following items:

- The implementation of this SEP;
- Consultation activities conducted with all groups of stakeholders;
- The effectiveness of the engagement processes in managing impacts and expectations by tracking feedback received from engagement activities; and
- Number of grievances received.
- Performance will be reviewed regularly against the SEP by tracking the following indicators:
 - Materials disseminated; type, frequency, and location;
 - Place and time of formal engagement events and level of participation by specific stakeholder categories and groups;
 - Number of comments by issue/ topic and type of stakeholder, and details of feedback provided;
 - Number and types of grievances and the nature and timing of their resolution;
 - Recording and tracking commitments made to stakeholders; and

- Community attitudes and perceptions towards the Project based on media reports and stakeholder feedback.

5.7.2 Data Gathering and Tracking

Stakeholder consultation activities conducted throughout all the phases of the Project and grievance submitted by any relevant external parties will be properly recorded and documented. This will enable the Project to track the consultation activities and to determine whether any issue or concern expressed by the stakeholder needs to be addressed and acted upon immediately. Particularly with respect to grievance management, it will also provide information whether the grievance has been partially or fully addressed. A stakeholder and grievance database are proposed will require populating on a regular by Project Stakeholder Management officer subsequent to each stakeholder engagement event undertaken or after receiving any grievances from external parties.

5.7.3 Reporting

The Project will develop regular reports (bi-annually during the construction and annually during operations) to present all activities for the period and summarized raised issues. This report should be developed from the data analysis of the stakeholder and grievance database managed by the Project. The report will also detail the measures taken to address the issues, timeline of responses, as well as corrective and mitigation measures to address grievances, and analysis of trends. It will be supported by records of engagement activities, grievances submitted and minutes of key meetings.

The report will particularly highlight the following aspects:

- Total number of stakeholders engaged according to stakeholder category;
- Number of comments and queries received according by topic and responses given;
- Issues raised and levels of support for and opposition to the Project;
- Numbers of grievances logged; and
- Time to resolution of grievances.

SEP should be considered as a live document, as such must be regularly updated to reflect Project and stakeholder changes.

5.7.4 Roles, Responsibilities, and Resources

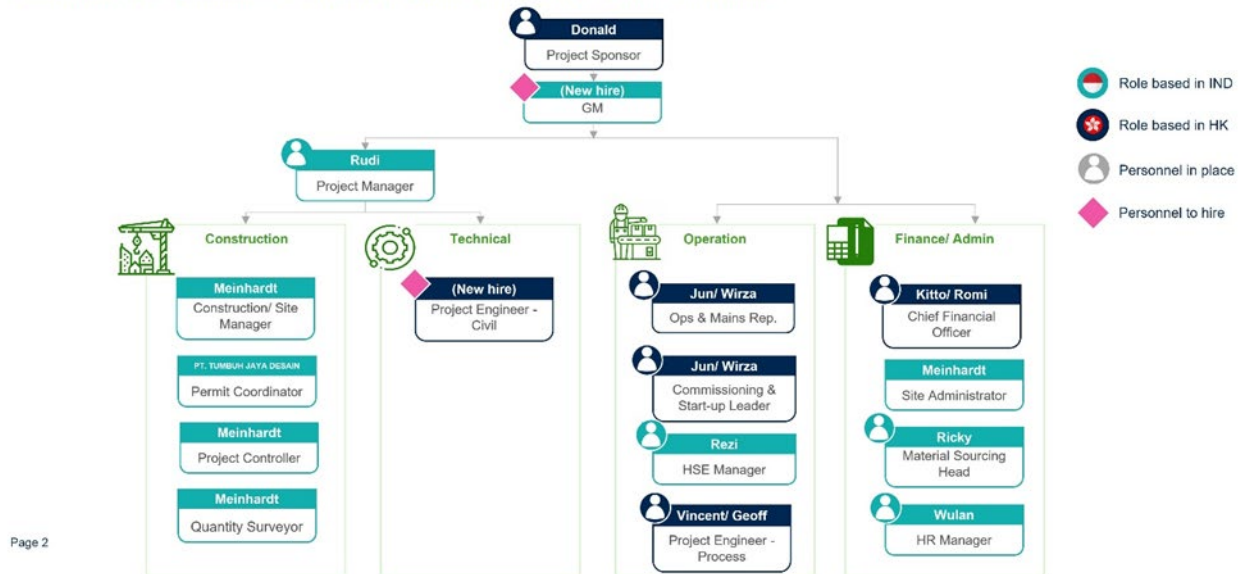
The Stakeholder Engagement Plan (SEP) will be effective if adequate resources – people, systems and processes, and associated financial resources – are assigned to implementation, and if responsibilities are clearly defined. Stakeholder engagement management should be recognized as a business function with clearly defined objectives, assigned responsibilities, timelines, budget, senior management oversight, and regular reporting.

It is understood that the Project has established an organizational structure to be applied during construction and operation phase which involve a range of roles and responsibilities of departments and divisions. However, as part of the recommendation under the Environmental and Social Management Plan, additional staff / unit are proposed particularly in the aspect of Health, Safety and Environment and Stakeholder Engagement.

Figure 5.4 and **Figure 5.5** presents the Project organization arrangement for construction and operation phase. Specifically, SPV personnel should be responsible for the receipt of grievances, investigation and close out and reporting.

Organizational chart for Construction Phase

Distribution of responsibilities between HK-based functions and on-site individual.

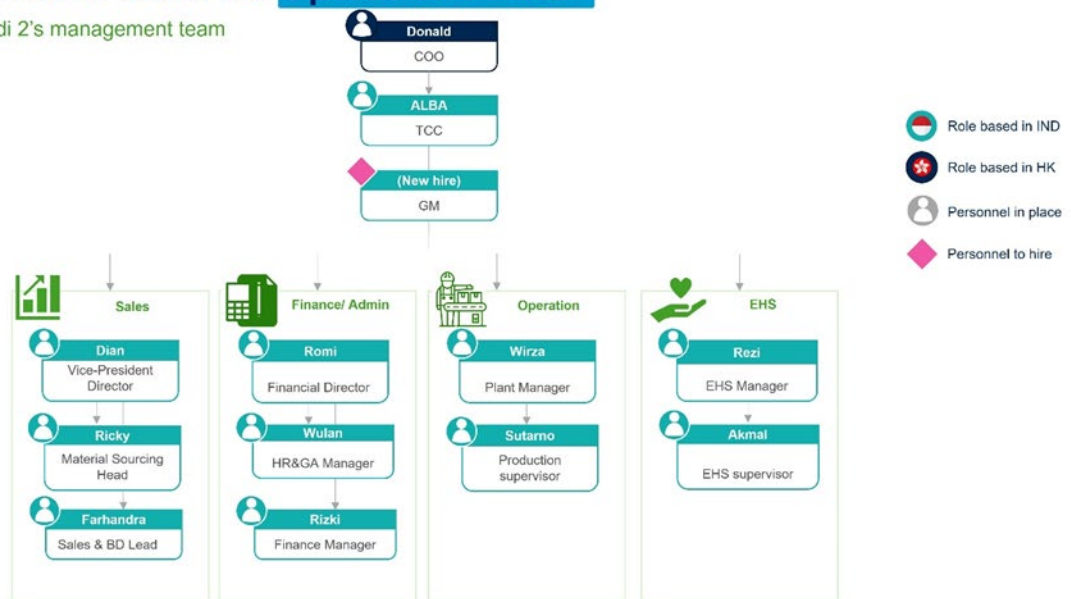


Page 2

Figure 5.4 Organization chart for the Project's Construction Phase

Organizational chart for Operation Phase

Overview of Tridi 2's management team



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Figure 5.5 Organizational Chart for the Project's Operation Phase

5.8 Third party supplier assessment

To support the operationalization of the PET Bottle Recycling Facility in Kendal Industrial Park, Project Company will work with third-party suppliers who will provide the Project with plastic bottle waste. It is to ERM's understanding based on the data provided by ALBA that there are currently 22 suppliers registered with the Client (PT Tridi Oasis Group) and located in the surrounding of the Project site. Each supplier has a different capacity to supply PET bottles ranging from 12 tons to 300 tons per annum.

During the site visit, ERM with assistance from ALBA and Tridi was able to conduct labor and working condition assessments on 4 selected representative suppliers from the total of 22 suppliers considered for the Project, which three (3) of them located in Semarang; and another one (1) located in Demak Regency. The selection of suppliers' representative were based on their high supply capacity and the proximity of the location to the Project site (travel time). The list of selected suppliers can be seen in **Table 5-5** below.

Table 5.5 Selected Suppliers

No	Name	Capacity (ton/annum)		
1	A	300		
2	B	250		
3	C	50		
4	D	250		

This section will further describe ERM findings on the labor and working conditions of each supplier based on the reference framework stated in the previous section. **Table 5-6** presents the labour and working condition of selected supplier visited during the field survey.

Table 5.6 Labour and Working Conditions of Suppliers

Supplier		Pressing Machines	Number of Workers **	Working Days/Week	Working Hours/Day	Social Insurance	HR Policy	Workers Contract	HSE Policy	HSE Practice	Grievance Mechanism	Prevention of Child and Forced Labor
A		5	50	6	8	All Registered	None	None	None	Safety briefing each month	The established grievance mechanism is informally conducted through Chief of Production and not systematically documented.	Screening using ID Card
B		2	23	5	9	5 of 23 Registered	None	None	None	Collaborated with YPCII for HSE Induction and Training	The established grievance mechanism is informally conducted through admin and not systematically documented.	Screening using ID Card Collaborated with JARAK for Child Labor Prevention through awareness training including risk identification.
C		2	16	6	7	None	None	None	None	None	The established grievance mechanism is informally conducted through admin and not systematically documented.	Screening using ID Card
D		2	15	5	7	None	None	None	None	None	The established grievance mechanism is informally conducted through Warehouse Chief of Production and not systematically documented.	None

** No workers database available to breakdown gender proportion of all facilities, but it is noted that most of workers are women; except for machine operators and waste pick-up driver

5.8.2 Employment Practices

- Supplier A: This facility has 50 workers, which mainly come from the surrounding community. Supplier A seeks to empower surrounding vulnerable groups, such as elderly women, widows, out-of-school youth groups, and other who had difficulties in seeking formal jobs. All of the workers have been registered into social insurance and paid by the facility. Currently, there are no formal HR policies and working hours in this facility is 8 hours per day from Monday to Friday. Supplier A has established wage structure based on worker's position as described below:
 - Plastic Waste Sorter: IDR 500/kg; each worker averaging 10 kgs/day and received approx. IDR 50,000/day; equivalent to \$3.35 USD/day
 - Others (Machine Operator, Plastic Weighing, Driver): IDR 1,500,000/month plus attendance allowance of IDR 260,000/month; in total equivalent to \$117.82 USD/month
- Supplier B: This facility has 23 workers, which mainly come from the surrounding community. A small number of workers came from Temanggung and Demak (approx. 2 hours driving from Semarang). Most of the workers are elderly women for sorting parts and men for press and shredder machine operators. Supplier B provides a worker's camp close to the facility to accommodate workers from outside Semarang. Only 5 out of 23 workers have been registered into social insurance and paid by the facility, which refers to Supplier B' assessment of potential risk that maybe occurred during work. Currently, there are no formal HR policies and working hours in this facility are 9 hours per day from Monday to Thursday, and Saturday. Supplier A has established a wage structure based on worker's position as described below:
 - Plastic Waste Sorter: IDR 700/kg; each worker averaging 10 kgs/day approx. IDR 70,000/day; equivalent to \$4.69 USD/day

- Others (Machine Operator, Plastic Weighing, Driver): IDR 1,400,000/month; equivalent to \$93.72 USD/month
- Supplier C: This facility has 16 workers, which mainly come from the surrounding community. None of the workers have been registered in social insurance. Currently, there are no formal HR policies and working hours in this facility are 8 hours per day from Monday to Saturday. Supplier C has established a wage structure based on worker's position as described below:
 - Plastic Waste Sorter: IDR 500/kg; each worker averaging 10 kgs/day approx. IDR 50,000/day; equivalent to \$3.35 USD/day
 - Others (Machine Operator, Plastic Weighing, Driver): IDR 1,000,000 – 1,500,000/month; equivalent to \$66.94 – 93.72 USD/month
- Supplier D: This facility has 15 workers, which mainly come from the surrounding community. None of the workers have been registered in social insurance. Currently, there are no formal HR policies and working hours in this facility are 8 hours per day from Monday to Saturday. Supplier D has established a wage structure based on worker's position as described below:
 - Plastic Waste Sorter: IDR 500/kg; each worker averaging 10 kgs/day approx. IDR 50,000/day; equivalent to \$3.35 USD/day
 - Pressing Machine Operator: IDR 200/kg;
 - Waste Pick-Up and Delivery: IDR 150/kg plus transportation allowance of IDR 250/kg;

It is from ERM review on Central Java Governor's Decree Number 561/62 Year 2020 that minimum wage for Semarang and Demak, respectively are Rp 2,810,025 (\$185.17) and Rp 2,511,256 (\$165.49) per month. Hence, all selected suppliers still have not met this minimum wage requirement.

5.8.3 Safe Working Conditions

During the site visit, ERM observed several Occupational Health and Safety hazards in the workplaces including poorly designed and operated wastes handling equipment. In general, workers at all the supplier facilities do not use adequate PPE in processing plastic bottles. Basic PPE such as gloves, masks, vests, and helmets are not used by workers. Related to the use of pressing machines, it is noted that all suppliers still do not have adequate procedures for safety equipment handling such as safe operating procedures, press machine inspection, safety information, and training on safe use of machine. It is also confirmed that there has been no HSE induction and training, except for Supplier A Facility that held a safety briefing led by Chief of Production each month and at Supplier B Facility which have been collaborated with local NGO (YPCII), No specific health and safety prevention measures have been applied at all supplier's facility and no fire-drill emergency have been conducted. Some keys findings are highlighted in the **Table 5-7** below.

Table 5.7 Third-Party Photo and Documentation

Documentation

Supplier: Supplier A



Plastic bottle waste sorter do not wear any PPE



Pressing machine operator do not wear any PPE

Supplier: Supplier B



Shredder Machine operator do not wear any PPE



Facility located under 150 Kv High Voltage Electric Tower, which do not meet Horizontal Clearance Minimum standard required by Ministry of Energy and Mineral Resources Regulation No. 13 Year 2021

Supplier: Supplier C



Plastic bottle waste sorting activity is located under temporary facility



Plastic bottle waste do not properly store in storage facility

Supplier: Supplier D

Documentation



Plastic bottle waste has not been stored properly and blocked entrance to the storage



Pressing machine operator does not wear any PPE

5.8.4 Prevention of Child and Forced Labour

During the site visit, ERM found that no formal policies and procedures have been implemented by the suppliers related to prevention of child and forced labour at all suppliers' facility. However, it is confirmed that Supplier A, Supplier B, and Supplier C use National ID Card to screen for potential child labour for their facility's workers. Suppliers also made periodic informal visit to smaller-scale waste collectors which supplies plastic bottle waste to them to re-check any involvement of child and forced labour. No child and forced labour were found at the four suppliers' facility during site visit. However, potential risk of child and forced labour will get higher if the number of demands increased and required new smaller supplier.

Interview with management of each supplier as well as an inpromptu interview with suppliers' employee was carried out to obtain information about forced labour. It is found that only Supplier A has automated system (finger print) to record working hours of his employees. The rest are still using log book to manually record their employees working hours in a day. ERM review the log book and informed that salary payment is made based on the working hours record. There were no contract and pay slip for salary payment at all visited suppliers. Hence, the Project need to support the supplier to develop a dedicated and systematic grievance mechanism including its monitoring in order to address child and force labour risk.

5.8.5 Grievance Mechanism

During the site visit, ERM found that no formal policies and procedures have been implemented related to industrial relations and grievance mechanism processes at all of the reviewed supplier facilities. However, workers could raise their concerns related to employment practices to facility owner. According to the interview with the owner, the resolution of the worker solved by informal approach with practical solution. For instance, the payment system was adjusted based on the plastic weight after get complaint by the workers. It was also noted that no labour union or worker's representatives is found during site visit and no restriction to the worker to bargain collectively. In order to mitigate child or forced labour practice in the suppliers' activities, hence the Project need to support establishment of the system to do age check, development of proper contracts with working hours and salary payment, paid leave, and provide labour rights awareness training.

IMPACT ASSESSMENT AND PROJECT CATEGORY

This section presents the environmental and social impacts that may occur from the Project. The impact includes both positive and negative for potential direct and indirect impacts as well as assessing cumulative impacts to the physical, biological, socioeconomic, and cultural resources located within the Project’s Area of Influence (AoI). The AoI includes the Project site, surrounding tenants, and road access from the industrial complex entrance to the Project site. This section includes mitigation measures aimed to avoid, reduce, mitigate, or compensate for the potential adverse environmental and social impacts mentioned above.

6.1 Determination on the Degree of Impact Significance

Degree of significance of impact from the Project activities to the environment and also on social aspect is determined with reference to **Table 6-1**.

Table 6.1 Degree of Impact Significance

Degree of Significance	Description
Negligible	An impact of negligible significance is one where a resource/receptor (including people) essentially not be affected in any way by a particular activity, or the predicted effect is deemed “imperceptible” or is indistinguishable from natural background variations.
Minor	An impact of minor significance is one where a resource/receptor to experience a noticeable effect, but the impact magnitude is sufficiently small and/or the resource/receptor is of low sensitivity/vulnerability/importance; and
Moderate	An impact of moderate significance has an impact magnitude that is within applicable standards but falls somewhere in the range from a threshold below which the impact is minor, up to a level that might be just short of breaching a legal limit. This does not necessarily mean that impacts of moderate significance have to be reduced to minor, but that moderate impacts are being managed effectively and efficiently.
Major	An impact of major significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors).

Identification of potential impact and determination of significance of each identified impact is detailed below.

6.2 Impacts During Pre-Construction and Construction

6.2.1 Land Acquisition

It is obtained during the site visit that the land acquisition process for KIP is done by PT Graha Buana Cikarang (‘PT GBC’) which is a subsidiary of PT Jababeka, one of the KIP’s shareholders. PT GBC bought the land directly to the land owner or through intermediaries. However, the project site land status is guaranteed by KIP as “Hak Guna Bangunan” which means the right ownership of use has been obtained according to the Indonesian laws and regulations, endorsed by “Badan Pertanahan Nasional” / National Land Agency. Furthermore, the SPV is finalizing the land purchase of the Project site as of March 2023. The project site was also known as shrimp pond hence no physical displacement (relocation, home/shelter) was expected for the Project site. Hence, no significant impact is expected from these activities (**Degree of significance: Minor**).

6.2.2 Economic Displacement

The main source of local livelihood in the surrounding village of KIP area is by working as labourer/ employee, fish-shrimp pond worker, and farming. The Project site used to be a shrimp pond. Those in the tenure system of the shrimp/ fish pond are the affected persons by land acquisition of KIP development. No information was available on where those people went or did after the land acquisition process though there is possibility that they bought another pond with the compensation money. The Project site was reportedly usually used for recreational fishing only prior to the reclamation process and none dependent upon fishing in the Project site for their livelihood. Thus, no economic displacement impact is expected from the Project (**Degree of Significance: Minor**).

6.2.3 Economic Opportunities

The total area of the proposed project location is 25,669 square meters ~ 25.7 hectares equal to 0.12% of the total KIP 2,200 hectares area. The project site was a shrimp pond owned by three landowners and refer to further verbal information obtained during the site visit, the owner of the pond had most likely bought another pond in another location using money from the sold land. The compensation provided was reported to be sufficient to purchase another shrimp pond. However, concerns on replacement cost cannot be fully addressed due to the absence of evidence or documentation. With respect to prior use of the ponds for recreational fishing by passer by, it is considered that no economic opportunities were provided from the occasional fishing activities (**Degree of Significance: Minor**).

6.2.4 Land Clearing and Reclamation

Most of the KIP land area has been reclaimed/filled/levelled. The Project area within KIP is partially filled/partially pond area. During a recent site visit (conducted in December 2022), site clearing, and filling were not identified as an issue of concern by stakeholders.

The land reclamation activities pose potential impact on soil and groundwater quality from the possibility that soil procurement for land reclamation may have been sourced from illegal mining in the region with unknown source and soil quality that potentially contaminated. To get more information on the potential contamination of the soil and groundwater, a soil and groundwater sampling and analysis has been done prior to construction to prevent any adverse impact in the future. The parameters analyzed for the soil and groundwater refer to the applicable USEPA for VOCs, SVOCs, Total Petroleum Hydrocarbon (TPH), and Pollutant Heavy Metals and the result is compared with the Government Regulation no 22 of 2021 for contaminated land. The result shows that:

- According to the Government Regulation no 22 of 2021, the concentration of Contaminant of Potential Concern (COPC) ie. Barium, Beryllium, and Copper concentration at soil samples collected at three sampling point (SB-1, SB-2, and SB-3) should be equal or less than Level C standard values when the soil is used as base soil or backfilling material;
- Eight other heavy metals, namely antimony, arsenic, cadmium, lead, mercury, nickel, and zinc were detected at various concentrations across all the soil samples collected but none were above any of the Tier 1 Screening Criteria considered.

Therefore, the impact of land reclamation is not expected to be significant (**Degree of Significance: Minor**).

6.2.5 Land Use

The Project Site occupies only 0.001% (2.57 ha out of 2,200 ha) of the KIP. Refer to Figure 4.12, there is no mangrove in the Project's site boundary. Moreover, the whole area (including the remaining mangrove habitat along the shoreline) will be subjected to the development of the KIP master plan. There were also no indication of the endemic bird species in the Project area and its

surrounding from the site visit from 30 August to 2 Sept 2022. Therefore, the impact of the Project on local land uses in KIP is not considered to be significant (**Degree of Significance: Minor**).

6.2.6 Water Management

During the pre-construction and construction period, several civil works had been and will take place, including land clearing, backfilling, levelling, and grading. This will modify the landscape and change on-site drainage patterns. The result will likely be an increase in the run-off to nearby drainage, which may result in an increase in sedimentation. To minimize the potential impacts, a settling pond or silt fences should be constructed on-site that is designed to accommodate run-off from the site and minimize impacts. The size and dimensions of the pond should be based on local rainfall data and site topography.

There will also be risk on water contamination from the spill of fuel and other material used during the construction stage such as lubricant (new and used) as well as other hazardous substances. Impermeable secondary containment with 110% capacity of fuel tank provided onsite will be constructed where the containment will be completed with sump pit and spill clean up equipment. The new and used hazardous material will be stored in dedicated area supplemented with adequate clean up spill equipment to prevent surface water contamination.

Risks associated with water management are considered to be low, therefore no significant impact is anticipated from the use of water during the pre-construction and construction stage (**Degree of Significance: Minor**).

6.2.7 Traffic Management

Materials, goods, and workers will be transported to and from the Project site via KIP main access roads. Main roads (Jalan Raya Arteri) and Highway access become congested during peak periods (e.g. at the start and end of the work day around 8 AM and 5 PM daily). There are safety concerns along the local roads and Highways such as the poor condition of the road and illegal roadblocks "Pungutan Liar". To mitigate this issue, drivers will be briefed according to ALBA and KIP's health and safety procedures.

There is also potential for the Project to further exacerbate the current congestion experienced along the main road and Highway and contribute to degradation of the main road (that will be utilized). However, due to the short duration of the construction phase and the relatively small scale of the construction, it is not anticipated that these impacts will be significant (**Degree of Significance: Minor**).

6.2.8 Ambient Air Quality

Air quality can be affected by construction activities. Construction and traffic movements along unsealed roads can generate dust (or particulate matter), while the exhaust gases generated from vehicle movements and generators (such as Carbon Dioxide – CO₂) can result in pollution. Construction activities will also generate a range of noise. However, given the duration of the project construction period (± 24 months), relatively small scale of the Project and the temporary nature of the construction activities, the impacts associated with air and noise emissions are not expected to be significant. Mitigation measures, such as dust suppression, provision of vehicle's tyre cleaning pit, and minimization of traffic movements, will be specified in the construction contracts and managed on site (**Degree of Significance: Minor**).

6.2.9 Waste Management

- Construction activities will generate range of solid waste both non-hazardous and hazardous. KIP will provide non-hazardous waste services. General Contractor (GC) for construction and its subcontractor will work with KIP to manage non-hazardous waste management. Materials deemed to be recyclable will be sold to vendors provided by KIP if the tenant does not have a contract in place. These measures will eliminate any potential impact on the nearby environment.

- Generation of waste also potentially affect surface and ground water. Prior to disposal, the solid waste will be stored in dedicated storage area with a leak-proof cover designed to protect from rainwater.
- Hazardous waste (solid and liquid) generated from construction activities potentially affect soil, groundwater and surface water (if enter drainage system). Hence, those waste will be stored in dedicated temporary storage area where the design will follow the applicable Indonesia regulation. A log book will be provided to record the volume of the waste. The waste then will be handed over to the certified hazardous waste management company for further treatment and disposal. Manifest for every waste transfer will be recorded and stored on-site
- Black and gray water generated from domestic activities of construction workers' and site office potentially affect surface and groundwater. A temporary toilet will be constructed along with septic tanks (bio-septic tank) to collect and treat domestic wastewater. The treated wastewater will be regularly collected by a registered domestic waste treatment company (using truck) for further treatment or connected to KIP's manhole for treatment at KIP's WWTP.

Considering the short duration of the construction (± 24 months) and that generated waste will be managed in accordance with the Project's specific Environmental Management Plan, the impacts associated with waste generated from construction activities are not expected to be significant. **(Degree of Significance: Minor)**.

6.2.10 Occupational Health and Safety

Dynamic construction activities as well as the operation of construction site office potentially generate occupational health and safety issue. Occupational hazard such as heat stroke, heavy lifting, slip trip and fall, dehydration, may occur during construction stage. Unsupervised and working long hours may occur during the construction stage due to contractors sub-contracting works. A construction health and safety policy and plan for the construction will be prepared and implemented by the contractors. High risk construction activities will be identified, and actions taken to mitigate them as part of the construction management process. The SPV and its contractors (General Contractor and subcontractor) will ensure the implementation of H&S Policy and Plan through different methods eg. Tool box meeting, H&S campaign etc including mandatory requirement to wear proper Personal Protective Equipment (PPE), such as hard hats, safety gloves, hearing protection, and safety boots.

With all those measures, the impact on occupational health and safety during construction are not considered to be significant **(Degree of Significance: Moderate)**.

6.2.11 Community Health and Safety

There are several potential impacts on the community health and safety associated with the construction includes increased risk of accident and injuries with the materials, goods, and workers to and from the Project site (due to an increase in the amount of traffic on roads, increasing dust and sediments along the road to the project sites to transport materials and workers via Arteri road, and the unauthorized entry of community members into the Project area). Considering that the Project site is located within an industrial estate, unauthorized entry of community member to the Project area should be limited. However, a fence will be established around the Project site and the site provided with 24-hour security to minimize any potential unauthorized entry. Signage will be erected at the site outlining the potential health and safety risks to the community. Engagement with relevant stakeholders to ensure that they are aware of the potential health and safety risks associated with the Project will be in place and done in regular basis. In addition to, the presence of migrant workers from other city/regency or Province might pose risk to local community health and safety as well as security because those workers will stay in the surrounding residential areas during the construction stage. However, there were and are ongoing construction in the KIP which most likely also utilize migrant workers who stayed in the surrounding community's residential area (eg. rented house) hence the community has been fully aware of the risk on their health and security with the temporary presence of migrant worker during construction stage.

As such, impact of the construction activities to the community health and safety is not expected to be significant (**Degree of Significance: Minor**).

6.2.12 Employment

Positive impact potentially generated from the Construction activities from the range of employment opportunities, including several low-skilled construction roles. It is expected that most of the workers will come from the local area (ie. nearby villages and towns), and several skilled workers will be brought in to support the construction of the Project. However, the presence of skilled workers from outside of the area might create a friction with the low-skilled construction workers. To anticipate that, the Project will develop and implement document to mitigate this. As such, the impact on employment will be more on the positive side rather on negative. Nevertheless, the impact on employment on the Project's construction activities for local people in large degree might be limited to low-skilled construction roles and in short duration. As such, the impacts are not considered to be significant (**Degree of Significance: Minor**).

6.2.13 Energy

- Construction activities will require the use of energy to power the heavy equipment and machinery for construction as well as to generate electricity for both construction and site offices. Diesel generator only be used during the construction period before the permanent power supply from PLN is available. Emission from the generator may impact the surrounding environment. To mitigate the issue, regular maintenance of machinery and / or heavy equipment as well as emission quality will be checked to ensure the emission quality meet applicable national and KIP regulations for mobile sources.
- The usage of diesel generator and diesel fire pump will require the provision of diesel storage tanks that potentially contaminate soil as well as groundwater and surface water from any leakage or spillage. The refuelling of generator also potentially results in spillage. In addition, mobilization of diesel fuel in small container for refuelling also has potential spill during transportation. To prevent spillage or leakage from diesel fuel storage tank, it will be completed with impermeable secondary containment with 110% of tank capacity. Spillage from the refuelling of generators will be prevented from going into soil by providing drip pan to collect any spill and providing secondary containment or sump pit for the generators. As for mitigation of spillage of diesel fuel in small container, it will be placed in container with tight cap and equipped with drip pan or absorbent material such as sand. The contaminated sand will be treated as hazardous waste.

With all those approaches, the impact from energy usage during construction are not expected to be significant (**Degree of Significance: Minor**).

6.2.14 Noise

Increase in noise level coming from both construction and traffic (mobilization of equipment and materials) are expected to occur during the construction period. This may impact the surrounding tenant and the environment along the access to the project site. To minimize the noise impact to the surrounding of the Project area, the project team will continuously monitor the noise level at the boundary of the project area. While to minimize impact from traffic to transport equipment, materials, and logistics to the Project site, the Project team will ensure that the transport will only occurs during business hours. Impacts from noise are therefore not considered to be significant.

Noise impacts generated from construction activities may cause displacement of species during construction. Bird species in the Project area are fairly common, tolerant of a level of disturbance. However, they are only likely to suffer limited temporary displacement or behavioural impacts from project construction noise and disturbance due to short term of construction activities (\pm 24 months) and the fact that area within KIP has been modified. As such, no significant impact is expected from

the noise generated during construction to the wildlife in the Project site particularly for bird species (**Degree of Significance: Minor**).

6.2.15 Climate Change

The Project site is located in KIP where KIP is in the shoreline of Java Sea and previously was in form of fish / shrimp pond and mangrove forest. The opening of the area, clearing of the remaining mangrove, and the backfill of the fish / shrimp pond to be ready for construction activities by KIP has made the Project site more prone to the climate change physical risk as described in detail in **Section 6.5**. The risk from climate change is estimated from flooding and sea level rise particularly for construction activities. KIP informed that they have installed barriers, drainage channels and water pumps to mitigate flooding in the area. However, considering that flooding due to high tide and heavy rainfall in the Semarang area which is relative close to the KIP is relatively frequent, potential impacts are expected from the physical climate change risk to the KIP in general. Nonetheless, due to the short duration of construction and the mitigation measures being applied by KIP, the impact is expected not significant (**Degree of Significant: Moderate**).

6.3 Impacts During Operations

6.3.1 Water Management

The Project will approximately use 200,000 liters of fresh water per day. All wastewater will be first treated by the onsite Project wastewater treatment plant (WWTP). The industrial process is expected to produce effluent with a high concentration of suspended particles, as indicated by high suspended solid, and high levels of organic pollutants, as indicated by high COD and BOD. To address this, the project will established an onsite wastewater treatment plant (WWTP) that utilizes biological treatment process consisting of anaerobic and aerobic systems. Specifically, the WWTP will use UASB and activated sludge unit processes for anaerobic and aerobic treatment, respectively. After treatment, 70% of the WWTP effluent will be directed to the KIP WWTP for further treatment before being discharged into the environment. The remaining 30% will undergo further treatment onsite to produce recovered water using MBR technology and re-used by the Project facility.

Currently all fresh water supply in KIP's tenants is sourced from four (4) deep groundwater wells (aquifer) that has been treated. During the drought season, the operation maybe impacted by the lower volume of water supply from KIP. The Project site will continue to maximize water recycling system while in addition, KIP is currently also constructing Water Treatment Plant (WTP) to source water from the Blorong River to provide additional water supply security to its tenants where the newly construct WTP is planned to start operating in Q2/Q3-2023. It is said by KIP that local people use shallow groundwater for their daily uses, therefore there is no impact between the extraction of deep ground water for KIP's use and those in shallow ground water for community use. Impacts from water management are therefore not anticipated (**Degree of Significance: Minor**).

6.3.2 Air Emission

Air emissions is expected to occur during the extrusion process that will approximately produce; (1) Dust content: < 5 mg/Nm³ and (2) Volatile Organic Compound VOC content: < 15 mg/Nm. The approximate output exceeded the KIP regulation (Dust content: < 0.2 mg/Nm³). To reduce the dust content of emissions, an additional filtering system with HEPA technology will be installed. HEPA technology uses a dense layer of fine mesh fibers to remove airborne contaminants from the air through mechanical filtration, thereby lowering the dust content and other emissions. Acetaldehyde, Limonene, Benzene, and Toluene are the typical volatile organic compounds (VOCs) that are emitted from the production process of recycled polyethylene terephthalate (rPET). The activated carbon filters will be installed to mitigate any potential VOC emissions ie. Acetaldehyde, Limonene, Benzene, and Toluene from the extrusion/SSP plant exhaust. These filters have proven to be highly effective in

removing VOCs from exhaust air, thus ensuring that the plant remains compliant with regulations and environmental standards.

The Project site will also have back up diesel generator (700KVA) in case of electricity cut off. The operation of generator will generate emission although only temporarily. Regular maintenance of the generator is required while monitoring of its emission needs to be done in accordance with the applicable National and KIP regulation. The Project will apply a high standard of housekeeping throughout its operations to prevent the release of fugitive dust emissions. This will be monitored through the ESMS. Impacts from air emissions are therefore not considered to be significant (**Degree of Significance: Moderate**).

6.3.3 Odour

Supplier of plastic bottle will be sourced from tens of parties around the region. Based on the site visit to four (4) selected suppliers, the level of hygienic vary from one supplier to another. The impact here would be odour leakage that may disturb the surrounding tenant and other during the transport of the feedstock supply, although PET feedstock is not typically odourous. To ensure feedstock is not odourous, a detailed allowable contaminant specification has been developed and will be imposed. To mitigate the potential odour issue, should specific suppliers prove to supply feedstock that is off-spec, or tends to be odourous, the suppliers will be put on notice, and off-spec materials will be returned. Environmental impacts from odour are therefore not anticipated (**Degree of Significance: Minor**).

6.3.4 Scattered Plastic Bottle

The process of transporting plastic bale from the third party supplier location to the Project site might cause some littering of the waste along the road and lead to used plastic to go into water stream. In addition to, removal of unfit PET bottle from manual selection might cause those bottles improperly dispose of and scattered in the surrounding area. An SOP will be developed for third party supplier to ensure that all transport truck have proper containment and will not be overloaded to prevent spillage or loss of materials in transportation. Regular inspection on the implementation of the SOP will take place and as part of ESMP. Similarly the Project will put in place housekeeping procedures at the facility to prevent accidental release of materials within and outside of the site boundary. Regular daily housekeeping inspections will be undertaken as part of the ESMP to prevent impacts from materials or wastes. Environmental impacts from plastic bottles are therefore not anticipated (**Degree of Significance: Minor**).

6.3.5 Noise

The Project is expected to produce high decibels in specific areas alongside machinery which may reach (85dB) within indoor areas. KIP applies a noise limit of (70dB) at the site boundary. Appropriate PPE will be provided to workers active within high noise areas. All noisy machinery will be housed within the main building structure thereby minimising risk of outdoor noise exceedances. Although noise level in outdoor are predicted to meet the threshold for industrial area as per the applicable regulation, a regular noise level measurement will be part of environmental management and monitoring plan (*RKL – RPL Rinci*) of the Project. Environmental impacts due to noise are therefore not considered to be significant (**Degree of Significance: Minor**).

6.3.6 Waste Management

In terms of liquid waste, the Project will be equipped with onsite WWTP to recycle (re-use) and treat both domestic and process wastewater to meet KIP wastewater quality standard (see Table 3.4) prior to the discharge into the KIP wastewater piping system to be further treated in the KIP's WWTP. One of the potential issues here is that leakage may occur due to wear and tear. Regular monitoring of the internal piping system will be established as part of the ESMP.

Considering that is no monitoring parameter for microplastics in the KIP's effluent quality standard, the Project Company will carry out regular monitoring on the presence of microplastics in the treated wastewater prior to entering KIP's wastewater channel. The proposed analytical methods for testing and reporting microplastics in the treated wastewater will be using Raman spectroscopy and infrared spectroscopy.

Non-hazardous waste will be stored in an enclosed manner to be later transported by the KIP service. Those will include waste generated from manual sorting of bottle after bale breaking as well as separation of cap -ring in washing plant and removal of non-melt solid contaminant in the Extrusion and SSP plant in addition to other solid waste resulted from the Project's activities.

The potential impact on solid waste would be the approximate general impurities coming from the washing line (expected to produce over 20 ton of waste per day). Sending this waste to the landfill would further exacerbate the environmental condition hence a vendor with valid licensed to manage the type of waste will be appointed to avoid the disposal of the waste to public landfill and to recycle or to reuse it to utmost possible. As for valuable waste (Metals, dust, and plastic flakes impurities – expected to produce over 7 ton of waste per day) will be sold to vendors for re-purposing.

Hazardous waste such as used lube oil from the machinery maintenance, oil contaminated rugs, empty containers of chemicals will be stored in a dedicated temporary storage for hazardous waste onsite. The temporary storage area will be developed in according with local regulation prior to transporting it to the licensed hazardous waste management contractor. The temporary storage will be designed to prevent leakage or spillage of hazardous waste into soil and water (groundwater and surface water). The potential impact here would occur from the third-party service that ranges from leakage during the transport. Regular monitoring of the third-party hazardous waste management will be included as part of the ESMP to prevent leakage or spillage and to effectively response to a spillage should there be an accident. Environmental impacts due to wastes management are therefore not considered to be significant (**Degree of Significance: Minor**).

6.3.7 Soil and Groundwater

Due to the presence of diesel generator as an electricity back up, a diesel fuel storage tank with 2,000 liter capacity or bigger will be built onsite. This storage tank potentially impact soil, groundwater and surface water from any leakage or spillage. To prevent that, the storage tank will be completed with impermeable secondary containment with 110% of its capacity where the secondary containment design also prevent any water contaminated oil to go into drainage. All areas of the site used for operations will be paved and the Project will provide spill containment and spill response kits to respond to any spillages on site. Environmental impacts due to soil and groundwater contamination are therefore not considered to be significant (**Degree of Significance: Minor**).

6.3.8 Occupational Health and Safety

A health and safety policy specific for the Project will be prepared and implemented for all workers. This will include regular fire emergency drill as the project is expected to process over 100 ton of plastic bottle per day. Fire is one of the major impacts and to minimize this risk the project will have water sprinkler throughout the facility. Emergency drill will also be conducted in a regular manner. The second major OHS matter is working with crushers. To minimize the impact that may occur during handling and maintaining the plastic crusher device, certain area will be restricted and equipped with remote emergency stop. Worker will also be refreshed on handling and maintaining of the device as part of the ESMP.

Another concern generally raise from the plastic recycling process is exposure of workers to indoor air pollutant during plastics' washing and melting potentially contain VOC, fine particles, and other chemical additives in plastics. To reduce the dust content of emissions, an additional filtering system with HEPA technology will be installed. The activated carbon filters also are considered to be installed to mitigate any potential VOC emissions from the Extrusion and SSP plant exhaust. Specific Policy

and Standard Operating Procedure will be prepared for the whole process and requirement on PPE for all workers to be put on while working. Regular indoor air quality monitoring will be done as part of ESMP.

High-risk work will be taking place periodically in the Project area and could cause a risk of injury without the presence of appropriate measures to review and monitor workers' performance, including their competence to perform specific high-risk works. Policy and SOP to ensure workers' competency to work in all position in the Project site (processing plant and office) will be developed, implemented, and reviewed regularly as part of OHS MS.

Workers in washing plant as well as Extrusion and SSP plant might pose risk from being exposed to significant level of noise from operating equipment or working within area with high noise level machinery although it will be limited to eight hours a day. Regular maintenance of equipment or machinery to ensure that the indoor noise level not exceed 85dB as required by the regulation as well as regular monitoring of indoor noise level and mandatory requirement for employees working in high noise level area to put on proper identified PPE will be enforced.

Exposure to extreme heat for workers while working in the washing line and Extrusion and SSP plant due to the use of hot water and melting machine with high temperature, respectively will be mitigated through development of OHS Policy and specific SOP for all workers to obey. Regular monitoring on OHS will take place as part of OHSMS and ESMP to minimise the health and safety risks to workers.

With all of those measures in place, impacts on occupational health and safety are therefore not expected to be significant (**Degree of Significance: Moderate**).

6.3.9 Community Health and Safety

Potential impact for the surrounding community's health and safety is from the odour and emission from the plastic recycling process. However, the Project site location inside KIP is not within the vicinity of the KIP boundary nor with residential or community areas. The potential impact might be for the neighbouring industrial facility. Respective impact on air emission, odour, and noise will be managed as per section 6.3.2, 6.3.3 and 6.3.5 above to minimise the risks of impacts to surrounding industrial neighbours. As such, no significant impact is anticipated on the community health and safety (**Degree of Significance: Minor**).

6.3.10 Third Party Supplier Occupational Health and Safety

Potential of Occupational Health and Safety issues regarding process safety for machinery equipment, including pressing, shredding, and sorting phase of supplier's operational activity are identified. In addition to, potential involvement of child and forced labour along the smallest scale supply chain beyond supplier's ability to screen without any formal procedure in place that might pose of health and safety risk during the waste collection process is also noted. The SPV will establish a SOP regarding Occupational Health and Safety for their third party supplier and implement regular training, capacity building, and audit program to minimize occupational health and safety risk on their third party supplier site where all of those will be part of their OHS MS. Plan – Do – Check – Act approach will be encouraged. Nevertheless, the encouragement and outreach to minimize risk of occupational health and safety might unable to reach the lowest level of supply chain, impacts might be considered to be significant (**Degree of Significance: Major**).

6.3.11 Employment

The operation of PET recycling facility at the KIP by the SPV potentially provide employment opportunity for the local people. As stated in the local newspaper in December 2022²¹, the number of local workforce employed by 82 companies that has been in operation within KIP reached about 17,650 employees where 1,857 of them were graduated from vocational school in Central Java

²¹ <https://jatengreport.com/bacaberita/991/kawasan-industri-kendal-mampu-serap-tenaga-kerja-lokal-dengan-gaji-di-atas-umk>

Province. The government of Kendal Regency as well as Central Java Province expect that more people will be hired to work in KIP along the year. The required employee for the Project's operation stage will need certain skill and competency for it will involve work with machine. The employee selection and recruitment will follow the applicable national regulation for those who meet the qualification and need of the Project. There is possibility that only few local people will be employed by the project as the professional worker due to the lack of competency where majority will be employed as low-skilled workers. This employment might bring limited positive impact to the local people but to certain degree lower the number of unemployment in the area. Nevertheless, potential friction might exist between local people and workers from outside of the area. Therefore, recruitment process will be done transparently and ensure equity between workers. The SPV will coordinate and socialize the employee need with the KIP and local labour agency to identify presence of qualified local people to be prioritized for the selection process. Negative impacts on the employment is not expected to be significant (**Degree of Significance: Minor**).

6.3.12 Public Perception

The operation of the Project although is inside KIP and relatively far from the nearby residential areas as the sensitive receptor (no direct boundary with residential area and the remaining residential area within KIP in the acquisition process is not adjacent to the project site) still pose risk to negative public perception from the incoming and storage of used PET bottle in form of plastic bale up to to the process in washing plant as well as extrusion and SSP Plant to generate rPET flakes and pellets that potentially generate odour, air emission, risk to occupational health and safety (eg. Heat, release of chemical content in the plastic, effect of contaminant in the wastewater to endocryn system etc). All those concern might disrupt the Project operation. In order to properly record and follow up any concern that lead to negative public perception, a Project specific grievance mechanism will be established, implemented, and regularly monitored. Any grievance will be dealt with properly and the record will be stored. To prevent any negative perception, information on the Project activities will be disclose in the SPV website or any other communication mechanism to provide clear and correct information about the Project and all necessary precaution that has been taken to mitigate any adverse impact to environment and the community. Impact from the misguided information by the public is not expected to be significant (**Degree of Significance: Moderate**).

6.3.13 Climate Change

The operation of PET recycling facility by the Project Company in the KIP potentially expose to the climate change physical risk as described in Section 6.3.5 of this report in form of water stress/drought, extreme heat, flooding, sea level rise, and strong wind/cyclone. The impact from climate change not only on the operational of the plant and its supply chain but also to the workers as they need to commute to the plant from their home and vice versa. The operation of the plant will take into account impact of climate change and it will be incorporated into the Project's Emergency Response Plan (ERP).

In regards to the climate change's transition risk as described in Section 6.3.5, the Project will consider its GHG Emission reduction plan along with the operational activities at the later stage of the operations such as the installation of solar PV or installation of electric generator with battery back up.

Considering the Project location and the mitigation action that will be taken by the Project Company, the impact of climate change is not expected to be significant (**Degree of Significance: Moderate**).

6.4 Project Category

It is understood that as part of review of environmental and social risks and impacts of a proposed investment, IFC uses a process of environmental and social categorization to reflect magnitude of

risks and impacts²². Refer to the detail description in Section 6.2 and 6.3 above, it can be seen that most of the degree of significance of the assessed environmental and social impacts are Minor. Moderate and Major significance are identified only for:

- Occupational Health and Safety aspect during Construction stage (Moderate)
- Climate change aspect during Construction stage (Moderate)
- Air emission, Occupational Health and Safety, Pulic Perception, and Climate Change during Operation stage (Moderate); and
- Third party supplier Occupational Health and Safety during Operation stage (Major).

Thus, based on those assessment and the mitigation plan in place, it can be concluded that the Project's environmental risk and impacts falls into **Category B** while for social risks and impacts it falls into **Category C** where it will have minimal or no adverse environmental or social risks and/or impacts.

6.5 Climate Impact Assessment

As an archipelago country, cities in Indonesia are mainly located within a 20-30 km radius from the shoreline. Almost 60% of the total population is found on Java Island, and the four main cities themselves (DKI Jakarta, Semarang, Yogya, and Surabaya) are located near the shoreline. Refer to Figure 3.1, it can be seen that the Project site is located near shoreline since KIP location is on the Java Sea coastal area. Hence, the Project site is prone to climate risk.

A report from the recent IPCC AR6 WBIII indicates that Southeast Asia, including Indonesia, is at a higher risk of flood and sea level rise while also experiencing a medium risk of extreme heat, rain, and drought (**Figure 6-1**). These are called physical risks, in addition, there is one other aspect that can be considered both risk and opportunity, this is called transition risks. In summary, climate-related risks can have physical and transition risks as described in the **Table 6-2** and **Table 6-3**, respectively.

²² https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/es-categorization#:~:text=As%20part%20of%20the%20review,magnitude%20of%20risks%20and%20impacts.

Key risks and adaptation options in select cities across Asia



Figure 6.1 Key Risk and Adaptation Option

6.5.1 Physical risk

Physical risk of climate change to the Project is presented in **Table 6-2** below.

Table 6.2 Physical Risk of Climate Change

Climate-related hazard	Data Report	Key Business Implications	Mitigation
Water stress / Drought (3-10 years timeframe)	<ul style="list-style-type: none"> ■ The National Body of Statistics (BPS) recorded 2 periods of drought in Central Java²³ (the province in which KIP is located) that affects; <ul style="list-style-type: none"> ○ 2014: 12,744 hectares ○ 2018: 42,156 hectares ■ Based on BPS record since 2017²⁴, some months shows extreme reduction in rainfall in the past 3 years (2017-2019) June to November, where other months continues to fluctuate. In addition, several areas in Central Java have recorded enduring between 30 to 60 days without any precipitation during the dry season (June and July). 	<ul style="list-style-type: none"> ■ Reduced availability of water for operations. ■ Increased costs toward water sourcing and treatment. ■ Increased water stress may lead to pressure from various stakeholders. ■ Loss of production and supply chain disruptions. 	<ul style="list-style-type: none"> ■ SPV to discuss with KIP and obtain information or document on their water risk assessment and water audit to understand potential risk for the Project's design and activities ■ Explore opportunities for rainwater harvesting at the Site or sea water reverse osmosis (RO) to adapt with possible water supply scarcity ■ Adopt water efficient/ saving technology to reduce water usage ■ Explore opportunities to reuse and recycle wastewater within the plant.
Extreme heat (3-10 years timeframe)	<ul style="list-style-type: none"> ■ The Meteorological, Climatological, and Geophysical Agency (BMKG) show a 0.2 – 1.2°C temperature anomaly above the average temperature²⁵ 	<ul style="list-style-type: none"> ■ Increased energy demand for cooling purposes / air conditioning ■ Increased breakdown of tools and equipment due to overheating ■ Increased risk of heat stress-related illnesses such as heat stroke, heat rash, etc. ■ Increase down time due to damage and maintenance to asset/ infrastructure. ■ Increased cost of repair and replacement of 	<ul style="list-style-type: none"> ■ Consider extreme heat conditions in the emergency response plan ■ Provide training to employees to identify symptoms of heat stress and provide first aid ■ Evaluate existing operational temperature ranges of the tools and equipment against projected extreme temperature

²³ Badan Pusat Statistik Provinsi Jawa Tengah, <https://jateng.bps.go.id/indicator/54/811/1/keadaan-bencana-alam-kekeringan-pada-tanaman-padi-menurut-kabupaten-kota-di-provinsi-jawa-tengah.html>

²⁴ Badan Pusat Statistik Provinsi Jawa Tengah, <https://jateng.bps.go.id/indicator/151/450/1/banyak-curah-hujan-dan-hari-hujan-menurut-bulan-di-provinsi-jawa-tengah.html>

²⁵ Ekstrem Perubahan Iklim, <https://www.bmkg.go.id/iklim/?p=ekstrem-perubahan-iklim>

Climate-related hazard	Data Report	Key Business Implications	Mitigation
		assets, equipment, and infrastructure	
<p>Flooding (3-10 years timeframe)</p>	<ul style="list-style-type: none"> The National Body of Statistics (BPS) indicate an increase frequency of flood occurring in Kendal. Data from 2018-2020 shows increasing case of flood occurring in the Kendal area from 5 cases in 2018 to 9 cases in 2020²⁶. 	<ul style="list-style-type: none"> Increase downtime and reduced revenue. Potential increase in OPEX to replace damaged machinery. Disruption of supply chains. 	<ul style="list-style-type: none"> SPV to discuss with KIP and obtain information or document on their flood (inland and coastal) risk assessment to understand potential risk for the Project's design and activities Design and implement suitable mitigation measures such as increasing the capacity of stormwater drainage or pumping system, construction of flood barriers, etc. Develop an ERP (Emergency Response Plan) system, which covers preparedness, response, mitigation, and recovery. Setting up an Emergency Response Team, periodic emergency drill programs, coordination with external parties, and emergency tools and equipment maintenance
<p>Sea Level Rise (20 years timeframe)</p>	<ul style="list-style-type: none"> IPCC AR6 Working Group II estimate that the Sea Level Rise (SLR) in Southeast Asia is expected to increase between 0.8 – 1.0 cm per year until 2100. In addition, many of the city in Indonesia is already below sea level. Currently, there are limited available public data in relation to sea level statistic in Kendal and Central Java province. 	<ul style="list-style-type: none"> Disruption of supply chains Sea level rise may contaminate coastal aquifers due to saltwater intrusion Permanent loss of land due to inundation and coastal erosion due to sea level rise. 	<ul style="list-style-type: none"> SPV to discuss with KIP and obtain information or document on their sea level rise and land subsidence risk analysis to further understand potential risk for the Project's design and activities

²⁶ Badan Pusat Statistik Provinsi Jawa Tengah, <https://jateng.bps.go.id/indicator/152/511/1/jumlah-kejadian-bencana-alam-menurut-kabupaten-kota-di-provinsi-jawa-tengah.html>

Climate-related hazard	Data Report	Key Business Implications	Mitigation
Wind / cyclones (3-10 years timeframe)	<ul style="list-style-type: none"> ■ Extreme wind (speed exceeding 120km per hour) capable of destroy the roofing of residential housing. ■ The National Board for Disaster Management (BNPB) has recorded an increase of extreme wind in the region of Central Java. In the last 10 years, since 2010, the average occurrence has increased from 100-200 cases each year to 200-300 cases each year²⁷. 	<ul style="list-style-type: none"> ■ Damage to the assets due to high wind speeds ■ Disruption of power supply which may last over a few days to weeks' time interrupting the operations ■ Disruption of supply chains ■ Safety of the employees 	<ul style="list-style-type: none"> ■ Comply with national or international best practices for wind load for design and construction of all structures. ■ Implement/ follow a monitoring mechanism with the national or regional meteorological agencies for an early warning system. ■ Develop a response mechanism to plan operations and take preventive steps to reduce impacts. ■ Include cyclones and wind as one of the hazards in site-level emergency response plans.

6.5.2 Transition Risk

Climate transition risk refers to the financial risks that arise from the transition towards a low-carbon economy that include various component from changes in policy, technology, market, and consumer behavior.

As the world shifts towards a low-carbon economy, companies that produce high levels of greenhouse gas emissions may face significant financial risks. For example, these companies may experience declining demand for their products, increasing regulatory and compliance costs. In addition, transition risk is also associated with a shift towards renewable energy sources and circular economy. Companies that are unable to adapt to this shift may be exposed to financial losses, as well as reputational risks.

In summary, transition risk related to financial risks that arise from the shift towards a low-carbon economy and the potential effects this shift could have on businesses and industries reliant on fossil fuels and significant greenhouse gas emissions.

IEA estimates that by 2040, global carbon emission will need to be net-zero to keep the potential increased of average global temperature below 2 degrees by 2100²⁸. This will require 50% reduction in oil demand compared to 2020. This will also require creative solution towards plastic manufacturing as it relies on oil production.

Risk potentially pose for the Project from transition on climate change risk mitigation is shown in **Table 6-3**.

²⁷ Badan Nasional Penanggulangan Bencana (BNPB), <https://dibi.bnpb.go.id/kbencana/index>

²⁸ <https://www.iea.org/reports/net-zero-by-2050>

Table 6.3 Transition Risk

Scenarios ²⁹	Unit	IEA 2030 (2020 Baseline)	IEA 2040 (2020 Baseline)	Risk	Opportunity
Carbon Pricing	\$/Ton	20-25	125	Cost Risk. Additional cost from carbon capping in industrialization process.	Cost Opportunity. Various of Carbon program available in Indonesia to enter the carbon market ³⁰ . The current carbon project in Indonesia is estimated to generate USD 13 -18 billion per annum.
Recycled Plastic Products	Ton	2.7x	5.0x	Reputational Risk. Indonesia is associated to child labor in relation to waste sectors ³¹ .	Reputational Opportunity. Recycled plastic can support many businesses in achieving circular economy as IEA predicted an increase of plastic products, however, downstream source is required to be constantly monitored.
EV cars	Car sales	17%	50%	Reputational Risk. Rising environmental concern to source EV materials responsibly.	Reputational Opportunity. Recycled plastic can support the responsible source of materials through the circular economy mechanism.

The transition opportunity and implication of climate change impact to the Project is shown in the **Table 6-4**.

Table 6.4 Transition opportunity and implication

Aspect	Transition and Opportunity	Business Implications
Policy and Legal	<ol style="list-style-type: none"> 1. Regulation on the domestic carbon price of approximately USD 2.06/tCO₂e set by the Indonesian government may impose a carbon tax on operations upon implementation. 2. The EU Carbon Border Adjustment Mechanism (CBAM) would face a 	<ol style="list-style-type: none"> I. Restrictive cap and trade policy. II. Carbon taxes. III. Other countries with net zero ambitions and carbon taxes may follow suit.

²⁹ Note: IEA data for ASEAN, unless and until specified, IEA data interpolated or extrapolated where needed
³⁰

https://bangda.kemendagri.go.id/berita/baca_kontent/1063/pengaturan_teknis_tata_kelola_perdagangan_karbon_usung_prinsip_kehati-hatian

³¹ <https://nasional.tempo.co/read/408068/17-juta-anak-bekerja-di-lingkungan-berbahaya>

Aspect	Transition and Opportunity	Business Implications
	carbon levy thus incurring a higher Operational Expenditure (OPEX) for exports into the EU.	
Technology	<ol style="list-style-type: none"> 1. A high Capital Expenditure (CAPEX) may be required for certain technologies. 2. Emerging technologies could contribute to improving circularity, e.g., waste management. 	<ol style="list-style-type: none"> I. Conduct an in-depth feasibility assessment of prioritized mitigation technologies for the company roadmap, and monitor their costs, availability, and changing regulations. II. Develop a technology rollout plan for GHG mitigation.
Market	<ol style="list-style-type: none"> 1. Increase in demand for recycled products 2. Increasing pressure from Investor and external stakeholders on setting Net-Zero target 	<ol style="list-style-type: none"> I. Accelerate investments in lower emissions technology and carbon removal.
Reputation	<ol style="list-style-type: none"> 1. Increased stakeholders concern/negative feedback. 2. Shift in consumer preferences/ Stigmatization of sector 	<ol style="list-style-type: none"> I. Increase in cost of capital, both debt and equity. II. Reputational risks can degrade the intangible value of the company and goodwill.

CUMULATIVE IMPACT ASSESSMENT

7.1 Introduction

Cumulative impacts are “those that result from the successive, incremental, and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones” (IFC, 2013). The multiple and successive environmental and social impacts caused by existing activities or conditions, combined with the possible incremental impacts that could result from future proposed and/or planned projects, can potentially generate greater cumulative impacts than would be expected in the case of a single project (IFC, 2013). According to the IFC, the assessment and management of cumulative impacts is appropriate when there is concern that a project or activity under consideration could contribute to generating cumulative impacts on one or more valued environmental and social component (VEC) (IFC, 2013).

This chapter presents the Cumulative Impact Assessment (CIA) for the Project conducted to evaluate the potential contribution of the Project towards the cumulative impacts on the resources identified as VECs.

Following good international industry practice, this CIA follows the IFC’s Good Practice Handbook—Cumulative Impact Assessment and Management: Guidance for Private Sector in Emerging Markets (the “Handbook”) (IFC, 2013). The Handbook provides a methodology for identifying the most significant cumulative impacts; the methodology includes a desktop review of publicly available information and consultation with key stakeholders.

This methodology focuses on environmental and social components, referred to in the handbook as VECs, which are: (1) rated as “critical” by potential project-affected communities and/or the scientific community; and (2) cumulatively impacted by the project under evaluation, by other projects, and/or by natural environmental and social external drivers (IFC, 2013). The methodology is considered consistent with the IFC Performance Standards (PS), especially PS 1 — Assessment and Management of Environmental and Social Risks and Impacts, PS 3 – Resource Efficiency and Pollution Prevention, and PS 5 – Land acquisition and involuntary resettlement (IFC, 2012).

7.2 Objective and Scope

The overall objective of this CIA is to identify and assess the contribution by the Project to cumulative impacts in the Project Aol. It is based on information presented throughout prior chapters of this ESIA, information provided by the Project Sponsor, and information available in the public domain. The specific objectives are to:

- Identify VECs that could be impacted cumulatively in areas potentially affected by the Project, considering input from stakeholders through the consultation process and the scientific community;
- Identify other existing and planned projects and external environmental and social drivers that could cumulatively impact VECs;
- Undertake a high-level assessment of potential cumulative impacts on VECs, considering the Project and the other identified existing and planned projects and external drivers in the area; and
- Recommend a management framework for the integrated management of potential cumulative impacts.

7.3 Methodology

7.3.1 Definitions of Key Terminology for the CIA

The following are definitions for key terminology used in the CIA (IFC, 2013).

Cumulative Impact: Impacts that result from the successive, incremental, and/or combined effects of an action, project, or activity added to other existing, planned, and/or reasonably anticipated actions, projects, or activities. For practical reasons, the identification, assessment, and management of cumulative impacts are limited to those effects generally recognized as important on the basis of scientific concern and/or concerns of affected communities.

CIA: Process to identify and evaluate cumulative impacts.

Other Projects: Existing, planned, or reasonably expected future developments, projects and/or activities potentially affecting VECs.

External Drivers: Sources or conditions that could affect or cause physical, biological, or social stress on VECs, such as natural environmental and social drivers, human activities, and external stressors. These can include climate change, population influx, natural disasters, or deforestation, among others. These are typically less defined and planned than Other Projects.

VEC: Environmental and social components considered as important by the scientific community and/or project-affected communities. VECs may include:

- Physical features, habitats, wildlife populations (e.g., biodiversity, water supply);
- Ecosystem services (e.g., protection from natural hazards, provision of food);
- Natural processes (e.g., water and nutrient cycles, microclimate);
- Social conditions (e.g., community health, economic conditions); and
- Cultural heritage or cultural resources aspects (e.g., archaeological, historic, or traditional sites).

VECs reflect the public and scientific community's "concern" or special interest about environmental, social, cultural, economic, or aesthetic values. VECs are considered the ultimate recipients of cumulative impacts because they tend to be at the ends of ecological pathways.

7.3.2 Limitations

The limitations applicable to this CIA include: (1) incomplete information about other projects and activities (e.g., the information is not available in the public domain); (2) uncertainty with respect to the implementation of future projects; and (3) difficulty in establishing thresholds or limits of acceptable change for VECs, and therefore the significance of cumulative impacts.

7.4 Determination of Spatial and Temporal Boundaries

Based on the identified Other Projects and VECs for the CIA, it was determined that the Project AoI (a 5 km radius from the Project is sufficient to serve as the spatial boundary of the CIA, in that it covers: (1) the extent of the VECs, and (2) the extent of the potential impacts from the Project, other projects, and external drivers.

Temporal delimitation for a CIA is frequently a challenge due to the uncertainty inherent to potential future projects and activities. For this reason, good international industry practice suggests consideration of a 3-year temporal boundary when conducting a CIA (IFC, 2013).

The CIA used this suggested time horizon for other projects and external drivers due to their uncertainty. As the Project has a greater level of certainty, a 25-year temporal boundary is used with respect to the Project, considering the construction (24 months) and operations (18 years) stages of the Project.

7.5 Identification of Other Projects and External Drivers

7.5.1 Other Projects

Considering that the project is located within the KIP, there are various industry in the area. As of January 2023³², KIP has 66 tenants in which 16 of them are in operation stage and 10 are in construction stage. The percentage type of industry within the KIP is explained in **Table 7-1**.

Table 7.1 Other Projects Within KIP

No	Type of Industry	Percentage (%)
1.	Fashion Industry	27
2.	Electronic	16
3.	Packaging	11
4.	Food & Beverage	11
5.	Furniture	10
6.	ceramic	10
7.	Construction materials	5
8.	Toys & Bicycle Industry	5
9.	Logistic and warehouse	3
10.	Furniture Industry	10
11.	Medical Equipment & Pharmacy	4
12.	Commercial	1
13.	Automotive	1
14.	Chemical	1
15.	Training Centre	1

Source: KIP Website, 2023

In accordance with the development plan of KIP³³, where it consist of Phase 1 Development (1,000 hectares) and Phase 2 Development (1,200 hectares), it can be seen that for Phase 2 development, it will be mixed of development activities ie. industrial area (600 hectares), commercial activities (60 hectares) and residential areas (180 hectares) as shown in **Figure 7.1** below.

³² <https://www.kendalindustrialpark.co.id/page/index/16/progress-business-entities?p=7>. Accessed on 23 January 2023

³³ <https://kendalindustrialpark.co.id/page/index/16/master-plan?p=3> Accessed on 26 April 2023



Source: Kendal Industrial Park website, 2023

Figure 7.1 Kendal Industrial Park (KIP) Master Plan

7.5.2 External Drivers

Regionally present external drivers and stressors were identified through the ESIA, including the following:

- Natural hazards as discussed in **sub section 4.2.7** and Climate risk as discussed in **Section 6.5**.
- Continuous development of the KIP and operation of various industry in the area as well as commercial and residential areas in the future.
- Construction and operation of Kendal Port and New Kendal International Seaport in the future.

7.6 VEC Identification and Selection

7.6.1 Overview

To be included in a CIA, a VEC must first be confirmed to be valued by some identifiable stakeholder group and/or the scientific community. Second, the VEC must be reasonably expected to be affected by both the Project components under evaluation (i.e., operation of PET recycling plant) and some combination of other projects and/or external drivers. Input from stakeholders has been collected as part of the ESIA stakeholder engagement and consultation process.

7.6.2 Selection of VECs

Potentially eligible VECs were analyzed against the following criteria: (1) confirmed to be valued by an identifiable stakeholder group (in the case of local communities, identified by a representative number of communities in the AoI) and/or the scientific community; (2) reasonably expected to be potentially impacted by the Project; and (3) reasonably expected to be potentially impacted by some combination of other projects and/or external drivers. **Table 7-2** summarizes the VEC screening results for this CIA.

Table 7.2 Selected VECs for Inclusion in CIA

VEC	Valued by Stakeholders or Scientific Community	Significantly Affected by the Project*	Potentially Affected by One or More Other Projects	Potentially Affected by One or More External Drivers	VEC Selected for the CIA
Social Economic	Yes	No	Yes	Yes	No
Public perception	Yes	No	Yes	Yes	
Air quality	Yes	Yes	Yes	Yes	Yes
Noise	Yes	No	Yes	Yes	No
Water quality (water body receiving treated wastewater)	Yes	No	Yes	Yes	No
Water quantity (clean water supply)	Yes	No	Yes	Yes	No
Waste volume and management	Yes	No	Yes	Yes	No
Soil	Yes	No	Yes	Yes	No
Land use (changes of landscape)	Yes	No	Yes	Yes	No
Land and Livelihoods	Yes	No	Yes	Yes	No
Biodiversity and ecosystem services	Yes	No	Yes	Yes	No
Community safety and wellbeing	Yes	No	Yes	Yes	No
Operational Health and Safety (in form of Occupational Health and Safety)	Yes	Yes	No	Yes	Yes

CIA = cumulative impact assessment; VEC = valued environmental and social component

* A residual impact significance rating of **Moderate** or above.

Several environmental and social receptors or components were not selected as potentially eligible for the CIA because they were not identified as components of value or concern by stakeholders; not reasonably expected to be significantly impacted by the Project; or not reasonably expected to be potentially impacted by some combination of other projects and/or external drivers.

7.6.3 Description of VEC Conditions

The baseline conditions of the selected VEC (air quality) is summarized in **Sub section 4.2.4**

7.6.4 Assessment of Cumulative Impacts on VECs

The significance of cumulative impacts is not evaluated in terms of the magnitude of change, but instead in terms of VEC response and the resulting condition and sustainability. If cumulative impacts do not

exceed the VEC threshold, the development of the project under assessment is considered acceptable. Given the intrinsic limitations of CIAs carried out by a private developer, the present study was not intended to obtain sufficient baseline information to establish thresholds of the selected VECs and therefore establish the significance of the cumulative impacts. Instead, based on the current project generated information and publicly available information, cumulative impacts were categorized by priority using the following definitions:

- **High Priority:** The VEC is expected to be or is currently being adversely impacted by other projects and/or external drivers and the future addition of the Project could incrementally contribute to the potential adverse impact. Actions should be implemented in the short term to mitigate potential adverse cumulative impacts on the VEC.
- **Medium Priority:** The VEC could potentially be impacted by other projects and/or external drivers, and the Project could potentially incrementally contribute to the adverse impact. Actions should be implemented in the medium term to mitigate potential adverse cumulative impacts on the VEC.
- **Low Priority:** The VEC is not expected to be potentially impacted by other projects and/or external drivers, and therefore the Project impacts would not be expected to contribute to an adverse cumulative impact. No actions are required to mitigate potential adverse cumulative impacts on the VEC beyond Project mitigation measures.

Table 7-3 summarizes the assessment of cumulative impacts for the VECs identified for the CIA.

Table 7.3 Cumulative Impact Assessment

VEC	Potential Impacts from the Project	Potential Impacts from Other Projects	Potential Impacts from External Drivers	Cumulative Impact	Priority
Air quality	<ul style="list-style-type: none"> Air emissions (dust content and VOC) are expected to occur during the operational activities. 	<ul style="list-style-type: none"> Other industries within KIP could result in ambient air pollution during the construction and operational phase. 	<ul style="list-style-type: none"> The area is located adjacent to the shoreline and mangrove previously presence was gradually cleared. This might affect the ambient air quality. 	<ul style="list-style-type: none"> Impacts would put additional stress on the existing ambient air quality in Project Aol. 	Medium Priority
Operational Health and Safety	<ul style="list-style-type: none"> Operational activity, specifically the plastic recycling process, is expected to increase workers' exposure to indoor air pollutants during plastics' washing and melting, potentially containing VOC, fine particles, and other chemical additives in plastics. Workers will also expose to hot equipment or machinery and working in a room with high temperature 	<ul style="list-style-type: none"> Direct potential impact from other Project is not expected although personal experience of workers joining from other project or company might create biases or affect compliance with the Project's OHS Policy and SOP 	<ul style="list-style-type: none"> Workers might loss their concentration or focus at work while operating machine due to personal issue or external drivers eg. climate change physical risk (extreme heat, flood, sea level rise) that might lead to occupational incident. 	<ul style="list-style-type: none"> Impacts would put additional stress on the existing operational health and safety. This could result in an increase in health hazards for the workers. 	Medium Priority

7.6.5 Cumulative Impact Management

Project design features and management measures included in the current ESIA provide a means to mitigate the specific contributions of the Project to effects on VECs, following the mitigation hierarchy. At the Project level, these measures are considered sufficient to address the contributions of the Project to cumulative impacts.

Ultimately, the management of cumulative impacts is the responsibility of government and regional planners. However, it is considered best international practice that private-sector developers make best efforts to engage relevant stakeholders and promote management of cumulative impacts in their project areas (IFC, 2013; Franks et al., 2010).

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

8.1 Environmental and Social Management Plan (ESMP)

An Environmental and Social Management Plan (ESMP) has been developed in **Table 8-1** below to provide recommendations to close the identified potential impacts and gaps.

Table 8.1 Environmental and Social Management Plan

Environmental/ Social Parameters/ Project Activities	Potential Impact	Mitigation Measures/ Corrective Action	Responsible Party on Mitigation Implementation	Means of Verification that Mitigation is Met	Monitoring Measures and Monitoring Locations	Time and Frequency of Monitoring	Monitoring Responsibil ity	Suggested Timeline for Completion	Staffing and Training Requirement s	Indicativ e Cost Estimate
Pre-Construction										
Socio-economic and Cultural Component										
Land acquisition	Complain from the heir of previous land owner of Project site	<ul style="list-style-type: none"> Legal document checking on the land status prior to finalizing purchasing process of the land to ensure no legal issue in the future 	SPV	<ul style="list-style-type: none"> No outstanding issue on the land status No complaint from local community claiming to be the heir of the land owner 	Final check of land status during purchasing process	During land purchasing process	SPV	Prior to the signing of land purchasing document	Legal team	No cost
Land use	Disruption to Project planning	<ul style="list-style-type: none"> Availability and socialization of community grievance management. Disclose the relevant information of the Project development plan the project stakeholders including KIP management Prepare Stakeholder Engagement Plan (SEP) to promote and consult with regards to the Project to cover construction and operations stage. The document will provide the basis on which engagement should be undertaken eg. by whom, with which (according the stakeholder mapping result), how frequent, for which event/ process, in what format, and what would be the record keeping 	SPV Stakeholder Engagement	<ul style="list-style-type: none"> Timely resolution of grievances received from the community. Availability of SEP and its implementation as per plan Proper record on stakeholder engagement activities 	Project site or any other location depend on the requirement	Throughout the planning stage.	SPV	Conducted throughout the planning stage	Stakeholder Engagement Team	No cost
Land clearing and reclamation	Soil pollutant / contaminant	<ul style="list-style-type: none"> Carry out soil and groundwater sampling and analysis at the Project site 	SPV	Phase II EBA for the soil and groundwater analysis will refer to applicable USEPA Standards for VOCs, SVOCs, Total Petroleum Hydrocarbon, and Pollutant Heavy Metals	<ul style="list-style-type: none"> Engage consultant or directly appoint subcontractor to carry out soil and groundwater analysis at the Project site 	One (1) time after the reclamation prior to construction	SPV	Prior to the construction activities	Stakeholder Engagement	Subject to quotation from laboratory subcontractor
Economic displacement	Loss of livelihood of the landowners	<ul style="list-style-type: none"> Cross check with KIP Management on the land acquisition process of the Project site to verify its 	SPV	<ul style="list-style-type: none"> No sign of loss of livelihood of previous landowners based on confirmation from KIP Management 	<ul style="list-style-type: none"> Discussion with KIP management 	During land purchasing process	SPV	Prior to the construction activities	Legal and Stakeholder	No cost

Environmental/ Social Parameters/ Project Activities	Potential Impact	Mitigation Measures/ Corrective Action	Responsible Party on Mitigation Implementation	Means of Verification that Mitigation is Met	Monitoring Measures and Monitoring Locations	Time and Frequency of Monitoring	Monitoring Responsibility	Suggested Timeline for Completion	Staffing and Training Requirements	Indicative Cost Estimates
		legality and confirm the form / condition of the project site prior to finalizing land purchasing process		<ul style="list-style-type: none"> Visual observation and confirmation on the utilization of the proposed project site after being acquired by KIP and prior to land purchase finalization 	<ul style="list-style-type: none"> Direct observation of the Project site 				engagement team	
Economic opportunities	Increased income or livelihood of the previous landowners from land compensation	<ul style="list-style-type: none"> Discussion with KIP management on the land acquisition process and obtain information on any indication that the previous landowners gained benefit from land compensation payment 	SPV	<ul style="list-style-type: none"> Information obtained from the KIP on the previous landowners and land acquisition process of the Project site 	<ul style="list-style-type: none"> Discussion with KIP management 	During land purchasing process	SPV	Prior to the construction activities	Legal and Stakeholder engagement team	No cost

Environmental/ Social Parameters/ Project Activities	Potential Impact	Mitigation Measures/ Corrective Action	Responsible Party on Mitigation Implementation	Means of Verification that Mitigation is Met	Monitoring Measures and Monitoring Locations	Time and Frequency of Monitoring	Monitoring Responsibility	Suggested Timeline for Completion	Staffing and Training Requirements	Indicative Cost Estimates
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Construction

Socio-economic and Cultural Component

Employment	Increased job opportunities	<ul style="list-style-type: none"> Develop Labor Management Plan (LMP) that will outline measures to mitigate labor risks and impacts during project construction. LMP may cover worker demobilization during transition from construction to operation. Transparent recruitment and integrated socialization by Project, industrial park, and contractors; Prioritize recruitment of local workers, based on the availability of qualified staff with acceptable skills in the construction phase; and Follow applicable national laws on labor recruitment. 	<ul style="list-style-type: none"> SPV Contractor Management KIP 	A certain percentage of workers are absorbed from local communities.	<ul style="list-style-type: none"> SPV KIP Local government 	During the construction stage, particularly at the recruitment stage.	SPV	Conducted throughout the construction stage	Human Resource and Labour Management	Subject to the human resource requirement.
Community Health and Safety	<ul style="list-style-type: none"> Increased risk of accident and injuries with the materials, goods, and workers to and from the Project site 	<ul style="list-style-type: none"> Put up a fence around the Project site and the site provided with 24-hour security to minimize any potential unauthorized entry. Signage will be erected at the site outlining the potential health and safety risks to the community Engagement with relevant stakeholders to ensure that they are aware of the 	<ul style="list-style-type: none"> SPV General contractors (GC) and subcontractors 	<ul style="list-style-type: none"> No unregistered entry to the project site during construction site No project related incident involving local community No health and safety issue from the workers of the Project construction with the local community No social friction between migrant workers with local community Regular report on the labor management 	<ul style="list-style-type: none"> Monitoring measures: weekly check on H&S record and grievance record, monthly review on the labour management plan implementation, and weekly 	Every six months during the construction stage	SPV General Contractors and subcontractors	Construction stage	<ul style="list-style-type: none"> Labour management Grievance report 	Subject to the human resource requirement and agreement with GC

Environmental/ Social Parameters/ Project Activities	Potential Impact	Mitigation Measures/ Corrective Action	Responsible Party on Mitigation Implementation	Means of Verification that Mitigation is Met	Monitoring Measures and Monitoring Locations	Time and Frequency of Monitoring	Monitoring Responsibility	Suggested Timeline for Completion	Staffing and Training Requirements	Indicative Cost Estimate
	<ul style="list-style-type: none"> Health and safety risk from unauthorized entry of community members into the Project area) 	<ul style="list-style-type: none"> potential health and safety risks associated with the Project will be in place and done in regular basis Regular discussion with GC to monitor any health, safety, and security issue with the workers as well as social friction with local people for migrant workers during the construction stage Develop and implement Labour Management Plan 			<ul style="list-style-type: none"> discussion with GC on this matter Monitoring location: Construction site and surrounding community area where construction workers stays 					
Environmental Component										
Water Management	Decrease surface water quality due to increasing sedimentation	<ul style="list-style-type: none"> Develop ESMS document specific for the Kendal Project site from construction to operation stage in conformance with ALBA Group ESMS document Develop local-level SOP on water management that provides mitigation action from the identified risk on run off water during construction stage; Establish effective E&S management staff on Site level to ensure effective implementation of SOP for surface water; Develop indicators/KPIs and monitoring system to keep track of performance on the water management at the site level; Alignment with KIP Construction Policy; Construction of settling pond and/or silt fences designed to accommodate run-off from the site; and Strict compliance supervision for the General Contractor during construction activities 	<ul style="list-style-type: none"> SPV General Contractors and subcontractors 	<ul style="list-style-type: none"> Site HSE & Social team is established to ensure implementation of the SOP Performance indicator / KPI and monitoring system for the project site is developed and implemented No complaint from KIP regarding surface water management or drainage water quality during construction: Compliance with applicable regulations and KIP Policy; Regular sampling and No unfiltered surface water disposal to a drainage ditch. 	<ul style="list-style-type: none"> Monitoring measures: Daily visual observation on the run off water condition to KIP's drainage ditch and weekly TSS sampling on the surface water discharge point. The TSS analysis result comply with KIP's standard Monitoring locations: Project site 	Throughout construction stage with frequency of monitoring as defined in the <i>RKL – RPL Rinci</i> (Detail RKL – RPL) of the Project or on daily basis for visual check of the sedimentation pond/silt fences and the KIP's drainage condition	SPV, General Contractors and subcontract	Subject to the completion time.	On-site environmental personnel	Subject to the agreement with the contractors.
Traffic Management	Traffic/ Navigation	<ul style="list-style-type: none"> Mobilization to be done outside peak hours (7-9 am, and 4-6 pm) and in communication with the KIP Management Develop <i>RKL – RPL Rinci</i> (Detail Environmental Management and Monitoring Plan) to comply with the applicable national law and regulation and align with the 	<ul style="list-style-type: none"> SPV General Contractors and subcontractors 	<ul style="list-style-type: none"> Site HSE & Social team is established to ensure implementation of the SOP Performance indicator / KPI and monitoring system for the project site is developed and implemented Comply with ALBA's Supplier Code of Conduct and Contractor Management Procedure; and 	Visual observation for any traffic impact and log book completion if there are any report on traffic	Throughout construction stage with frequency of monitoring as defined in the <i>RKL – RPL Rinci</i> (Detail RKL – RPL) of the Project or at least once every six	SPV, General Contractors and subcontract	Subject to the completion time.	On-site environmental personnel	n/a

Environmental/ Social Parameters/ Project Activities	Potential Impact	Mitigation Measures/ Corrective Action	Responsible Party on Mitigation Implementation	Means of Verification that Mitigation is Met	Monitoring Measures and Monitoring Locations	Time and Frequency of Monitoring	Monitoring Responsibility	Suggested Timeline for Completion	Staffing and Training Requirements	Indicative Cost Estimate
		KIP's AMDAL. The document should cover mitigation action from traffic impact		<ul style="list-style-type: none"> No issue with traffic and no complaint related to vehicles mobilization during construction activities. 		months during the construction stage				
Ambient Air Quality	Decreasing air quality from mobilization of equipment and materials	<ul style="list-style-type: none"> Develop ESMS document specific for the Kendal Project site from construction to operation stage in conformance with ALBA Group ESMS document Develop local-level SOP on Ambient Air Quality that provides mitigation action from the identified risk during construction stage; Transporting truck is covered with a tarpaulin to prevent dust during soil transportation from flying on the road; Dust suppression through regular watering of the road; Provision of vehicle's tyre cleaning pit in the Project site; Comply with KIP regulations on Air Pollution; and Taking the ambient air sample using a gas sampler, then the ambient air sample is analyzed in the laboratory. 	<ul style="list-style-type: none"> Relevant Contractor/ Supplier SPV HSE Department 	<ul style="list-style-type: none"> Site HSE & Social team is established to ensure implementation of the SOP Performance indicator / KPI and monitoring system for the project site is developed and implemented No dust flows into the air from the material transporting vehicle; and No mud is generated from the vehicle's tires during the transportation of materials. 	<ul style="list-style-type: none"> Ambient air quality monitoring in the defined monitoring point refer to the baseline data collection ; Analysis of ambient air quality result not to exceed threshold for ambient air quality as defined in the Government Regulation no 22 of 2021 	Throughout construction stage with frequency of monitoring as defined in the <i>RKL – RPL Rinci</i> (Detail RKL – RPL) of the Project or at least once a month	SPV	Subject to the completion time.	On-site environmental personnel during construction Good training on EMP	Subject to the agreement with the contractors.
Waste management	Generation of solid waste (non-hazardous and hazardous) and liquid waste potentially affect soil, surface, and groundwater quality	<ul style="list-style-type: none"> Develop ESMS document specific for the Kendal Project site from construction to operation stage in conformance with ALBA Group ESMS document Develop local-level SOP on waste that provides mitigation action from the identified risk during construction stage; General Contractor (GC) for construction and its subcontractor will work with KIP to manage non-hazardous waste management. Materials deemed to be recyclable will be sold to vendors provided by KIP if the tenant does not have a contract in place Solid waste will be stored in dedicated storage area with a leak-proof cover designed to protect from rain and contamination of surface water as well as to prevent 	<ul style="list-style-type: none"> SPV Relevant contractor 	<ul style="list-style-type: none"> Site HSE & Social team is established to ensure implementation of the SOP Performance indicator / KPI and monitoring system for the project site is developed and implemented Reporting of solid waste generated volume covering non-hazardous and hazardous waste Record of manifest for hazardous waste transfer Waste is segregated according to its characteristic and managed properly Presence of temporary storage for hazardous waste that comply with applicable regulation No contamination of soil, surface and groundwater from the generation of waste 	<ul style="list-style-type: none"> Agreement with 3rd party for bio-septic tank cleaning Data are described descriptively and compared with quality standards/ applicable regulation provisions; Logbook is available to record the generated waste; Temporary storage for hazardous 	Throughout construction stage with frequency of monitoring as defined in the <i>RKL – RPL Rinci</i> (Detail RKL – RPL) of the Project or at least weekly internal audit is done on waste management implementation	SPV	Subject to the completion time	<ul style="list-style-type: none"> On-site environmental personnel during construction Good training on EMP and H&S management 	Part of the construction budget

Environmental/ Social Parameters/ Project Activities	Potential Impact	Mitigation Measures/ Corrective Action	Responsible Party on Mitigation Implementation	Means of Verification that Mitigation is Met	Monitoring Measures and Monitoring Locations	Time and Frequency of Monitoring	Monitoring Responsibil ity	Suggested Timeline for Completion	Staffing and Training Requirement s	Indicativ e Cost Estimate
		<p>solid waste from entering water stream</p> <ul style="list-style-type: none"> ■ Provision of temporary toilet along with bio-septic tanks to collect and treat domestic wastewater. The treated wastewater will be regularly collected by a registered domestic waste treatment company (using truck) for further treatment or connected to KIP's manhole for treatment at KIP's WWTP ■ Implement waste segregation policy on the construction site; ■ Hazardous waste will be stored in dedicated temporary storage area where the design will follow the applicable Indonesia regulation. A log book will be provided to record the volume of the waste. Later, the will be handed over to the certified hazardous waste management company for futher treatment and disposal. Manifest for every waste transfer will be recorded and stored on-site 			<p>waste is in place and met the Minister of Environment and Forestry regulation no 6 of 2021 requirement;</p> <ul style="list-style-type: none"> ■ Monitoring location: Project site. 					
Occupational Health and Safety	Occupational risk and hazard from the construction activities	<ul style="list-style-type: none"> ■ A construction health and safety policy and plan for the construction will be prepared and implemented by the contractors. ■ High risk construction activities will be identified, and actions taken to mitigate them as part of the construction management process. The SPV and its contractors (General Contractor and subcontractor) will ensure the implementation of H&S Policy and Plan through different methods eg. Tool box meeting, H&S campaign etc including mandatory requirement to wear proper Personal Protective Equipment (PPE), such as hard hats, safety gloves, hearing protection, and safety bootsFor high risk work ■ Compliance with KIP Regulation or Policy on Construction 	<ul style="list-style-type: none"> ■ SPV ■ HSE Department 	<ul style="list-style-type: none"> ■ No incident related occupational health and safety during construction stage ■ Construction employees fully undertand and comply with the OHS Policy 	Project site boundary	Throughout construction stage with frequency of monitoring to be determined in the Project OHSMS	SPV	Subject to the completion time	Environmental Management	Subject to the agreement with the contractors.

Environmental/ Social Parameters/ Project Activities	Potential Impact	Mitigation Measures/ Corrective Action	Responsible Party on Mitigation Implementation	Means of Verification that Mitigation is Met	Monitoring Measures and Monitoring Locations	Time and Frequency of Monitoring	Monitoring Responsibility	Suggested Timeline for Completion	Staffing and Training Requirements	Indicative Cost Estimate
Energy	Use of energy to generate power to move heavy equipment / machinery and electricity that will emit emission to air and the presence of fuel storage tank potentially impact soil, ground and surface water	<ul style="list-style-type: none"> ■ Diesel generator only be used during the construction period before the permanent power supply from PLN is available. Emission from the generator may impact the surrounding environment. Regular maintenance of machinery and / or heavy equipment as well as emission quality will be checked to ensure the emission quality meet applicable national and KIP regulations for mobile sources ■ Diesel fuel storage tank will be completed with impermeable secondary containment with 110% of tank capacity. ■ Spillage or leakage from Spillage from the refueling of generators will be prevented from going into soil by providing drip pan to collect any spill ■ Mobilization of diesel fuel in small container for refueling has potential of spillage during transportation. That will be prevented by putting the fuel in container with tight cap and equipped with drip pan or absorbent material such as sand. The contaminated sand will be treated as hazardous waste ■ The refueling of generator also potentially results in spillage. It will be prevented from going into soil by providing drip pan to collect any spill and providing secondary containment or sump pit for the generators 	<ul style="list-style-type: none"> ■ SPV ■ HSE Department 	<ul style="list-style-type: none"> ■ No contamination of soil, surface and groundwater from the spillage of diesel fuel use / storage during construction ■ Any diesel fuel contaminated material is treated as hazardous waste and manage accordingly 	<ul style="list-style-type: none"> ■ Daily check on the diesel fuel storage area to identify any leakage or spillage ■ Regular check on the secondary containment ■ Regular check on the soil and surface water to identify any trace of oil ■ Impromptu audit on the diesel fuel management ■ Record any oil spill or leakage ■ Monitoring locations: construction site and diesel storage area 	Throughout construction stage with frequency of monitoring in daily basis through visual observation	SPV	Subject to the completion time	Environmental Management	Subject to the agreement with the contractors.
Noise	Disruption to the surrounding environment	<ul style="list-style-type: none"> ■ Comply with KIP regulation on noise level (along the boundary fence around 70dB(A)) by providing sound barrier (engineering / technical approach) ■ Regularly monitor the noise level at the boundary of the project area to ensure it does not exceed the threshold and if so, analyze the cause and 	SPV HSE Department	<ul style="list-style-type: none"> ■ Measuring the noise level using a noise level meter; and ■ The data collected is tabulated and then compared with the quality standards set by Kep.50/MENLH/11/1996. 	Project site boundary	Throughout construction stage with minimum once a month of noise monitoring in one sampling point. The monitoring will follow Minister of Environment	SPV	Subject to the completion time	Environmental Management	Subject to the agreement with the contractors.

Environmental/ Social Parameters/ Project Activities	Potential Impact	Mitigation Measures/ Corrective Action	Responsible Party on Mitigation Implementation	Means of Verification that Mitigation is Met	Monitoring Measures and Monitoring Locations	Time and Frequency of Monitoring	Monitoring Responsibility	Suggested Timeline for Completion	Staffing and Training Requirements	Indicative Cost Estimate
		take immediate action to improve it				regulation no 48 of 1996				
Climate Change	Floods (high tide), sea level rise, extreme rain, strong wind / cyclone, land subsidence	<ul style="list-style-type: none"> ■ SPV to discuss with KIP and obtain information or document on their flood (inland and coastal) risk assessment to understand potential risk for the Project's design and activities ■ SPV to refer to KIP's soil condition and land filling method for Project's construction ■ Construction activities to consider the impact of floods from high tide and extreme rain to project timeline and the workers condition in the short term such as design and implement suitable mitigation measures such as increasing the capacity of stormwater drainage or pumping system, construction of flood barriers, etc. ■ Construction activities to take into account the possibility of sea level rise as long term impact of climate change in the plant's design ■ Comply with national or international best practices for wind load for design and construction of all structures. ■ Implement/ follow a monitoring mechanism with the national or regional meteorological agencies for an early warning system. ■ Develop a response mechanism to plan operations and take preventive steps to reduce impacts. ■ Include cyclones and wind as one of the hazards in site-level emergency response plans. 	SPV HSE Department	<ul style="list-style-type: none"> ■ The Project's plant design has incorporated climate change physical risk in the area ■ The Project's time line has considered the impact of climate change into the project's timeline as well as on the construction workers 	Project site boundary	Prior to the construction stage for the plant design and during the construction stage for the review of project timeline	SPV	Subject to the construction's start and completion target	Environmental Management	Subject to the agreement with the contractors.

Operations

Socio-economic and Cultural Component

Employment	Job opportunities from employment	<ul style="list-style-type: none"> ■ Operation stage will need certain skill and competency for it will involve work with machine. The employee 	<ul style="list-style-type: none"> ■ SPV ■ HR Department 	<ul style="list-style-type: none"> ■ Hiring procedure and standard is developed and implemented 	Regular review on the hiring procedure implementation and on the composition	Throughout operation stage and the review is taken annually	SPV	Throughout operation stage	Human Resources Policy	Subject to internal budgeting
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Environmental/ Social Parameters/ Project Activities	Potential Impact	Mitigation Measures/ Corrective Action	Responsible Party on Mitigation Implementation	Means of Verification that Mitigation is Met	Monitoring Measures and Monitoring Locations	Time and Frequency of Monitoring	Monitoring Responsibil ity	Suggested Timeline for Completion	Staffing and Training Requirement s	Indicativ e Cost Estimate
	with the Project for local people	<p>selection and recruitment will follow the applicable national regulation for those who meet the qualification and need of the Project.</p> <ul style="list-style-type: none"> There is possibility that only few local people will be employed by the project as the professional worker due to the lack of competency where majority will be employed as low-skilled workers. This employment might bring limited positive impact to the local people but to certain degree lower the number of unemployment in the area. Potential friction between local people and workers from outside of the area will be managed by transparent recruitment process. The SPV will coordinate and socialize the employee need with the KIP and local labour agency to identify presence of qualified local people to be prioritized for the selection process. Transparent employee recruitment process to mitigate any friction and ensure equity between employee 		<ul style="list-style-type: none"> Document and record on the employment process is established and implemented No protest or complaint from local people on the employee selection and recruitment process No friction between employee of the Project site 	of the employee at the Project site office					
Public perception	Disruption to Project operations from negative publication for the Project generated by misinformed and misjudged public perception	<ul style="list-style-type: none"> The SPV to develop implement grievance redress mechanism according to ALBA's SOP and monitor the implementation Prepare Project Disclosure Plan document and disclose the relevant information of the Project development plan to the identified project's stakeholders including KIP management To properly record and follow up any concern that lead to negative public perception, a Project specific grievance mechanism will be established, implemented, and regularly monitored. Any grievance will be dealt with properly and the record will be stored To prevent any negative perception, information on the Project activities will be disclose in the SPV website 	<ul style="list-style-type: none"> SPV Public relations department 	<ul style="list-style-type: none"> Grievance mechanism document for the Projec is established, implemented and regularly monitored Correct and adequate information on the Project activities are provided for public and easily accessible Timely resolution of grievances received from the community. Supporting document on the implementation of project disclosure plan / stakeholder engagement plan No negative public perception towards the project 	<ul style="list-style-type: none"> Review of recorded grievance and close out of any report at the Project site Monitoring location: Project site 	Monthly review	SPV	Throughout operation stage	Communication management	Subject to internal budgeting

Environmental/ Social Parameters/ Project Activities	Potential Impact	Mitigation Measures/ Corrective Action	Responsible Party on Mitigation Implementation	Means of Verification that Mitigation is Met	Monitoring Measures and Monitoring Locations	Time and Frequency of Monitoring	Monitoring Responsibil ity	Suggested Timeline for Completion	Staffing and Training Requirement s	Indicativ e Cost Estimate
		<p>or any other communication mechanism to provide clear and correct information about the Project and all necessary precaution that has been taken to mitigate any adverse impact to environment and the community</p> <ul style="list-style-type: none"> ■ Include and incorporate gender inclusive and responsive aspect including women participation in meaningful consultation procedure as a stakeholder engagement management 								
Third-Party Suppliers	Ethical Practices	Ensuring that suppliers adhere to the Code of Conduct (CoC) where the CoC will follow ALBA Tridi 1 Plastic Recycling project	<ul style="list-style-type: none"> ■ SPV Suppliers 	<ul style="list-style-type: none"> ■ Regular monitoring of the suppliers with no violation of the code of conduct; and ■ Comply with ALBA's Supplier Code of Conduct and Contractor Management Procedure. 	Suppliers' Facility	Every six (6) months	Sourcing and Supplier Management Manager	Review every six (6) months	Human Resources	Subject to the frequency of the monitoring program.
	Disruption to safe working conditions	<ul style="list-style-type: none"> ■ Periodic monitoring of HSE policies and implementation at the suppliers' level by the SPV as part of SPV's HSE enhancement program for its suppliers; ■ Provision of adequate PPE (vest, helmet, gloves, mask) by suppliers' owner with direction from SPV that also consider climate change impact such as extreme heat for the PPE material; ■ Conduct HSE Induction and Training, including fire drill; and ■ Register all workers to social healthcare insurance 	<ul style="list-style-type: none"> ■ SPV ■ Suppliers 	<ul style="list-style-type: none"> ■ PPE checklist prior to work; and ■ Updated data on Social Insurance registration for all workers 	Suppliers' Facility	Every six (6) months	Sourcing and Supplier Management Manager	Review every six (6) months	Health and Safety Team	Subject to the agreement with the suppliers
	Involvement of Child and Forced Labor	<ul style="list-style-type: none"> ■ Ensure suppliers have formal policies and procedures for the prevention of Child and Forced Labor that comply with the existing National law and regulation and is incorporated in the contract with their workers stating working hours, allocated leave, payment method and frequency. ■ Monitoring on the suppliers' operation to identify no child labour from the lower level suppliers 	<ul style="list-style-type: none"> ■ SPV ■ Suppliers 	<ul style="list-style-type: none"> ■ Submission of Supplier manpower/workers report; ■ Development of Child and Forced Labor Prevention Policies; and ■ Report on the monitoring of suppliers' contract agreement with its workers and prevention of no child labour in the lower level supplier 	Suppliers' Facility	Every six (6) months	Sourcing and Supplier Management Manager	Review every six (6) months	Human Resources	No Cost

Environmental Component

Environmental/ Social Parameters/ Project Activities	Potential Impact	Mitigation Measures/ Corrective Action	Responsible Party on Mitigation Implementation	Means of Verification that Mitigation is Met	Monitoring Measures and Monitoring Locations	Time and Frequency of Monitoring	Monitoring Responsibility	Suggested Timeline for Completion	Staffing and Training Requirements	Indicative Cost Estimate
Water Management	Less availability of groundwater well supply for local people usage to meet the Project's clean water need	The Project will approximately use 200,000 liters of fresh water per day. During the drought season, the operation maybe impacted by the lower volume of water supply because currently KIP still sourced its clean water from four (4) deep aquifer wells while in parallel constructing Water Treatment Plant utilizing Blorong river water. To prevent the impact, following mitigation will take place: <ul style="list-style-type: none"> Compliance with the Estate agreement on water supply volume. Optimize the use of onsite recycled water for the processing Ahead planning of higher water supply requirement (if applicable from changes in process) and communicate it with KIP Management 	<ul style="list-style-type: none"> SPV 	<ul style="list-style-type: none"> Reporting of water flow rate and volume of recycled water to be used for operations Record of changes on the Project's process potentially increase water usage volume and early communication with KIP on this matter 	Project site	Throughout operation stage	SPV	Review every month	Environmental Management	Subject to the price of purchased water per cubic meter and source of the raw water
Air emission	Dust and VOC potentially generated during extrusion process and the operation of diesel generator as electricity back up	<ul style="list-style-type: none"> To address the issue of 1) Dust content: < 5 mg/Nm³ and (2) Volatile Organic Compound VOC content: < 15 mg/Nm at the Extrusion and SSP Plant, additional filtering system with HEPA technology will be installed. HEPA technology uses a dense layer of fine mesh fibres to remove airborne contaminants from the air through mechanical filtration. Acetaldehyde, Limonene, Benzene, and Toluene are the typical volatile organic compounds (VOCs) that are emitted from the production process of recycled polyethylene terephthalate (rPET). The activated carbon filters will be installed to mitigate any potential VOC emissions from the extrusion/SSP plant exhaust. These filters have proven to be highly effective in removing VOCs from exhaust air, thus ensuring that the plant remains compliant with regulations and environmental standards Regular maintenance of the generator and monitoring of its emission will be done in accordance with the applicable 	<ul style="list-style-type: none"> SPV HSE Department 	<ul style="list-style-type: none"> Concentration of dust and VOC comply with the applicable regulation on ambient air and also indoor air quality Emission monitoring for the diesel generator is done regularly according to the applicable regulation. Record of the monitoring is properly stored and no exceedance of emission concentration during operation stage 	<ul style="list-style-type: none"> Provision of sampling point at the diesel generator, taking of sampling and analysis of the samples. Ambient and indoor air quality sampling and analysis that includes dust and VOC and compare it with applicable regulation Monitoring to be done at the Project site 	Throughout production activities with frequency of monitoring follow Detail RKL – RPL (RKL – RPL Rinci) for ambient air and Occupational H&S MS for indoor air quality or at least once every six months with the monitoring parameter refers to the Ministry of Environment and Forestry Regulation no. 11 of 2021 for internal combustion emission. Monitoring parameter for ambient air quality refer to the Government Regulation no 22 of 2021 while indoor air quality will refer to the Minister of Manpower Regulation no 5 of	SPV	Review Quarterly	Environmental Management	Subject to the internal and external (subcon) cost

Environmental/ Social Parameters/ Project Activities	Potential Impact	Mitigation Measures/ Corrective Action	Responsible Party on Mitigation Implementation	Means of Verification that Mitigation is Met	Monitoring Measures and Monitoring Locations	Time and Frequency of Monitoring	Monitoring Responsibility	Suggested Timeline for Completion	Staffing and Training Requirements	Indicative Cost Estimate
		National and KIP regulation. The Project will apply a high standard of housekeeping throughout its operations to prevent the release of fugitive dust emissions. This will be monitored through the Project's specific ESMS document				2018. Another reference is WHO Global Air Quality guidelines for the ambient air quality threshold.				
Odour	Foul odour generated from transportation and storage of used PET plastic bottle in the Project area	<ul style="list-style-type: none"> To ensure feedstock is not odorous, a detailed allowable contaminant specification has been developed and will be imposed. To mitigate the potential odour issue, should specific suppliers prove to supply feedstock that is off-spec, or tends to be odorous, the suppliers will be put on notice, and off-spec materials will be returned Dedicated area with proper air circulation to temporarily store the feedstock at the Project's site will be established. Regular sanitary check will be done to ensure cleanliness 	<ul style="list-style-type: none"> SPV HSE Department General Affair 	<ul style="list-style-type: none"> No complaint from the nearby tenant on foul odour from the Project site Inspection as well as monitoring of third party supplier working condition take place regularly to ensure the hygiene and cleanliness of the sorted PET as feedstock for the Project activities 	<ul style="list-style-type: none"> Regular odour monitoring at the boundary of the Project site 	Throughout production stage with frequency of monitoring follow Detail RKL – RPL (<i>RKL – RPL Rinci</i>) of the Project or at least once every six months following the Minister of Environment Regulation no. 50 of 1996	SPV	Review Quarterly	Environmental Management	Subject to the internal and external (subcon) cost
Scattered plastic bottle	Used plastic to go into water stream from transportation from third party supplier location to the Project site and from selected unfit plastic bottle from manual selection for further process	<ul style="list-style-type: none"> An SOP will be developed for third party supplier to ensure that all transport truck have proper containment and will not be overloaded to prevent spillage or loss of materials in transportation. Regular inspection on the implementation of the SOP at the third party suppliers' work area. The Project will put in place housekeeping procedures at the facility to prevent accidental release of materials within and outside of the site boundary. Regular daily housekeeping inspections will be undertaken to prevent unexpected impacts from unused plastic bottle or other materials or wastes 	<ul style="list-style-type: none"> SPV HSE Department General Affair 	<ul style="list-style-type: none"> No scattered used plastic during transportation from third party supplier to the Project site and at the Project site 	<ul style="list-style-type: none"> Spot check on the transportation vehicle on its loaded material containment for transportation Regular check on the Project site condition to ensure proper management and disposal of unused plastic bottle 	Throughout operation stage on daily basis through visual observation	SPV	During operation stage	General affair	n/a
Noise	Generation of high decibel from machinery operations disrupt the surrounding environment	<ul style="list-style-type: none"> All noisy machinery will be housed within the main building structure to minimise risk of outdoor noise exceedances with threshold of 70 dBA as per KIP and applicable national regulation 	<ul style="list-style-type: none"> SPV HSE Department 	<ul style="list-style-type: none"> Noise level monitoring result comply with the regulation 	<ul style="list-style-type: none"> Regular measurement of the noise level using a noise level meter; 	Throughout operation stage with frequency of monitoring to follow Detail RKL – RPL (<i>RKL – RPL Rinci</i>) of the	SPV	Review Quarterly	Environmental Management	Subject to the internal and external (subcon) cost

Environmental/ Social Parameters/ Project Activities	Potential Impact	Mitigation Measures/ Corrective Action	Responsible Party on Mitigation Implementation	Means of Verification that Mitigation is Met	Monitoring Measures and Monitoring Locations	Time and Frequency of Monitoring	Monitoring Responsibility	Suggested Timeline for Completion	Staffing and Training Requirements	Indicative Cost Estimate
		<ul style="list-style-type: none"> Regular noise level measurement will be part of environmental management and monitoring plan (RKL – RPL Rinci) of the Project 			<ul style="list-style-type: none"> The data collected is tabulated and compared with the quality standards set by the applicable regulation. Monitoring to take place in the ALBA site boundary 	Project or at least every six months. The monitoring will follow Minister of Environment regulation no 48 of 1996				
Waste Management	Generation of solid waste (non-hazardous and hazardous) and liquid waste potentially affect soil, surface, and groundwater quality	<ul style="list-style-type: none"> Onsite WWTP to recycle (re-use) and treat water will be constructed to treat the generated wastewater (from domestic and plant activities) prior to the discharge into the KIP wastewater piping system to be further treated in the KIP's WWTP. The onsite WWTP will treat the generated liquid waste to meet KIP wastewater quality standard (see Table 3.4) Sampling and analysis on treated wastewater from the Project's WWTP for microplastic using Raman spectroscopy and infrared spectroscopy Potential leakage may occur due to wear and tear. Regular monitoring of the internal piping system will be done for early identification of pipeline's wear and tear Process is carried out in the fully enclosed Extrusion Building. Meshes will be installed on all floor drains to prevent the materials to enter the drainage General impurities coming from the washing line (Expected to produce over 20 ton of waste per day). A licensed waste vendor will be appointed to manage the waste to avoid sending this waste to the landfill which would further exacerbate the environmental condition hence. Valuable waste (Metals, dust, and plastic flakes impurities – expected to produce over 7 ton of waste per day) will be 	<ul style="list-style-type: none"> SPV HSE Department General Affairs 	<ul style="list-style-type: none"> Onsite WWTP is operated well 24/7 and the quality of treated wastewater meet the KIP regulation SOP to carry out regular check on the wastewater pipeline condition is in place, implemented properly completed with supporting document on the record of undertaken check Licensed waste vendor is identified, contract is in place and work in progress audit take place to ensure compliance and integrity of the vendor Proper vendor to re-use the valuable waste is identified, contract in place, work in progress audit take place to ensure compliance and integrity of the vendor The microplastics analysis result from the treated wastewater to be compared with microplastics analysis result of clean water supplied by KIP because there is no national or international standard for microplastic in treated wastewater 	<ul style="list-style-type: none"> Monitoring of liquid waste will follow requirement in the Detail RKL – RPL but in minimum should cover daily flow rate, pH, temperature, TSS and weekly/monthly check on the treated wastewater quality Project site area following KIP parameter 	Throughout operation stage with weekly check on the pipeline condition and annual work in progress audit for respective vendor; bi-annual monitoring of microplastic in the clean water supply and treated wastewater from the Project's site	SPV	Review annually	Environmental Management	Subject to the internal and external (subcon) cost

Environmental/ Social Parameters/ Project Activities	Potential Impact	Mitigation Measures/ Corrective Action	Responsible Party on Mitigation Implementation	Means of Verification that Mitigation is Met	Monitoring Measures and Monitoring Locations	Time and Frequency of Monitoring	Monitoring Responsibil ity	Suggested Timeline for Completion	Staffing and Training Requirement s	Indicativ e Cost Estimate
		sold to vendors for re-purposing								
Soil and groundwater	Contamination of soil and groundwater due to the spillage of diesel fuel from 2,000 liter storage tank	<ul style="list-style-type: none"> The storage tank will be completed with impermeable secondary containment with 110% of its capacity where the secondary containment design also prevent any water contaminated oil to go into drainage. All areas of the site used for operations will be paved and the Project will provide spill containment and spill response kits to respond to any spillages on site 	<ul style="list-style-type: none"> SPV HSE Department General Affairs 	<ul style="list-style-type: none"> No contamination of soil, surface and groundwater from the spillage of diesel fuel use / storage during operation 	<ul style="list-style-type: none"> Visual observation on any spillage or leakage on soil, facility's floor, and presence of oil sheen on water surface Monitoring to be done at the diesel fuel storage tank area and other area that used diesel fuel 	Visual observation on any spill on soil to take place in daily basis during operation stage. Analysis of soil and groundwater will depend on the visual observation record	<ul style="list-style-type: none"> SPV 	Throughout operation stage	Environmental management	Subject to the internal and external (subcon) cost
Occupational Health and Safety	Incident to workers related to the occupational health and safety	<ul style="list-style-type: none"> A health and safety policy specific for the Project will be prepared and implemented for all workers. Policy and SOP to ensure workers' competency to work in all position in the Project site (processing plant and office) will be developed, implemented, and reviewed regularly as part of OHS MS Risk from handling and maintaining the plastic crusher device, will be prevented by imposing restriction to certain area and equipped the area with remote emergency stop. Worker will also be refreshed on handling and maintaining of the device as part of the Project's HSE MS and SOP on Rotating and Crushing equipment Exposure of workers to indoor air pollutant during plastics' washing and melting potentially contain VOC, fine particles, and other chemical additives in plastics will be mitigated by installing adequate air filter or purifier system to maintain healthy indoor air quality. Specific Policy and Standard Operating Procedure will be prepared for the whole process and requirement on PPE for all workers to be put on while working. Regular indoor air quality monitoring will be done as part of the 	<ul style="list-style-type: none"> SPV HSE Department 	<ul style="list-style-type: none"> No incident caused by occupational health and safety Implement temperature stress management to reduce impact to workers in Extrusion and SSP Plant Regular monitoring on OHS is being taken as part of OHSMS and ESMP to minimise the health and safety risks to workers Regular review on the future need of PPE that is appropriate for possibility of greater extreme of heat (combination of the climate change risk and working condition) Presence and establishment of Emergency Response Team with sufficient training as per Project company policy and the Government's regulations as well as establishment of certified first aider team in alignment with the number of employees in one shift Presence and operation of Project's site clinic to manage treatable case or collaboration with nearby clinic or hospital for medical emergency 	<ul style="list-style-type: none"> Monthly discussion on the OHS aspect between Management, EHS Department, and representative for other department to review HSE (including OHS) performance, continuous improvement program and HSE awareness Regular OHS audit Proper record and follow up on any corrective action related to OHS from the OHS audit 	Throughout operation stage with monthly meeting on HSE Performance	<ul style="list-style-type: none"> SPV 	Throughout operation stage	OHS Management	Subject to the internal cost

Environmental/ Social Parameters/ Project Activities	Potential Impact	Mitigation Measures/ Corrective Action	Responsible Party on Mitigation Implementation	Means of Verification that Mitigation is Met	Monitoring Measures and Monitoring Locations	Time and Frequency of Monitoring	Monitoring Responsibility	Suggested Timeline for Completion	Staffing and Training Requirements	Indicative Cost Estimate
		<p>Projects's OHS MS and SOP on Indoor air quality</p> <ul style="list-style-type: none"> ■ Workers in washing plant as well as Extrusion and SSP plant might pose risk from being exposed to significant level of noise from operating equipment or working within area with high noise level machinery. The risk will be mitigated through Regular maintenance of equipment or machinery to ensure that the indoor noise level not exceed 85dB as required by the regulation as well as regular monitoring of indoor noise level and mandatory requirement for employees working in high noise level area to put on proper identified PPE will be enforced. ■ Exposure to extreme heat for workers while working in the washing line and Extrusion and SSP plant due to the use of hot water and melting machine with high temperature, respectively will be mitigated through development of OHS Policy and specific SOP for all workers to obey. ■ Provision of reachable drinking water stations in the operation area ■ Appointment of HSE representative from each department to form HSE Committee to increase awareness that HSE is responsibility of everyone and not only HSE Dept. 								
Community Health and Safety	Health and safety impact to community as a result of the Project activities	<ul style="list-style-type: none"> ■ Project site location inside KIP is not within the vicinity of the KIP boundary nor with residential or community areas. The potential impact might be for the neighbouring industrial facility. Impact on air emission and odour and noise will be managed as per section 10.2.2 and 10.2.3 above, respectively 	<ul style="list-style-type: none"> ■ SPV ■ HSE Department 	<ul style="list-style-type: none"> ■ No report on complaint from the neighbouring company on health and safety aspect 	<ul style="list-style-type: none"> ■ Proper record and follow up on any corrective action related to complaint from health and safety aspect 	Throughout operation stage	<ul style="list-style-type: none"> ■ SPV 	Throughout operation stage	OHS Management	Subject to the internal cost
Climate Change	Climate Change physical risk: Flood from high	<ul style="list-style-type: none"> ■ Incorporate emerging climate change driven ie. Flood, extreme heat, sea water level 	<ul style="list-style-type: none"> ■ SPV 	<ul style="list-style-type: none"> ■ The Emergency Response Plan has incorporated physical climate 	<ul style="list-style-type: none"> ■ Regular review of the operations' 	Annual basis and could be more	<ul style="list-style-type: none"> ■ SPV 	Throughout operation stage	Climate Change Risk	No cost

Environmental/ Social Parameters/ Project Activities	Potential Impact	Mitigation Measures/ Corrective Action	Responsible Party on Mitigation Implementation	Means of Verification that Mitigation is Met	Monitoring Measures and Monitoring Locations	Time and Frequency of Monitoring	Monitoring Responsibility	Suggested Timeline for Completion	Staffing and Training Requirements	Indicative Cost Estimate
	tide and sea level rise, drought and water scarcity that affect the Plant's operation	<p>rise, strong wind / tropical cyclone in the Project's Emergency Response Plan for Operation stage with regular update to reflect the most updated condition</p> <ul style="list-style-type: none"> ■ Regular review on the possible impact of water scarcity and drought to the plant's operation considering that the plant will rely on the KIP's capability to supply water in the required volume to ensure optimum operations. ■ Consider the impact of climate change physical risk when developing Project Adaptation Action (PAA) such as on the feedstock transportation in regards to flood along the Java's north coast road ■ SPV to discuss with KIP and obtain information or document on their water risk assessment and water audit to understand potential risk for the Project's operational stage ■ Explore opportunities for rainwater harvesting at the Site or sea water reverse osmosis (RO) to adapt with possible water supply scarcity ■ Adopt water efficient/ saving technology to reduce water usage ■ Explore opportunities to optimize reuse and recycle of wastewater within the plant ■ Develop scenario analysis to understand better future climate projections for sea level rise risk particularly related with the coastal subsiding ■ SPV to discuss with KIP and obtain information or document on their flood (inland and coastal) risk assessment to understand potential risk for the Project's design and activities ■ Provide training to employees to identify symptoms of heat stress and provide trained first aider on the Project site 		<p>change risk with target for regular review and update</p> <ul style="list-style-type: none"> ■ Regular discussion with the KIP Management on the water supply requirement and the Estate's capability to meet the required volume and quality ■ Project Adaptation Plan (PAA) is developed by taking into account all relevant climate change physical risk 	ERP for planned and unplanned event	frequent if necessary throughout operation stage			and Management	

Environmental/ Social Parameters/ Project Activities	Potential Impact	Mitigation Measures/ Corrective Action	Responsible Party on Mitigation Implementation	Means of Verification that Mitigation is Met	Monitoring Measures and Monitoring Locations	Time and Frequency of Monitoring	Monitoring Responsibil ity	Suggested Timeline for Completion	Staffing and Training Requirement s	Indicativ e Cost Estimate
		<ul style="list-style-type: none"> ■ Evaluate existing operational temperature ranges of the tools and equipment against projected extreme temperature increase 								

CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusion

It can be summarized from the ESIA that the environmental risk and/or impacts for the proposed project can be mitigated and will have minimal or no adverse and can be classified as **Category B** while for social risks and/or impacts because it is located in an industrial estate, it can be classified as **Category C**. The classification is based on the fact that:

- The project site is located within KIP which obtained its revised Environmental Permit on 11 April 2017 through the issuance of Governor of Central Java Decree number. 660.1/11 Year 2017. The environmental and social impacts from the presence of the Industrial Estate have therefore already been assessed and that for the permitting of the project activities the SPV will need to develop Detail Environmental Management and Monitoring Plan (RKL – RPL *Rinci*) in alignment with the Estate’s RKL – RPL document to address environment and social impact of the project;
- The project site is neither situated in the vicinity nor in the boundary with residential areas or other sensitive receptors;
- The project site is not located in the close proximity with any critical habitat, key biodiversity area, or biodiversity hotspot. The area within KIP is considered modified habitat where the project site was previously a shrimp pond;
- With respect to the land acquisition of the project site the HGU (*Hak Guna Usaha* - Business Utilization Right) certificate has been completed and there have been no identified complaints from the past voluntary land acquisition;
- To reduce dust content concentration in emissions generated from extrusion process, an additional filtering system with HEPA technology will be installed. HEPA technology uses a dense layer of fine mesh fibers to remove airborne contaminants from the air through mechanical filtration, thereby lowering the dust content and other emissions. Acetaldehyde, Limonene, Benzene, and Toluene are the typical volatile organic compounds (VOCs) that are emitted from the production process of recycled polyethylene terephthalate (rPET). In order to mitigate potential VOC emission ie. Acetaldehyde, Limonene, Benzene, and Toluene from the extrusion/SSP plant exhaust., activated carbon filters will be installed to mitigate any potential VOC emissions.
- The project site will develop and operate site wastewater treatment plant to treat wastewater generated from domestic activities (black and grey water) and operational activities to meet the Estate’s wastewater quality standard prior to being treated further in the Estate’s wastewater treatment plant. Due to the absence of microplastic parameter in the KIP’s effluent standard for its tenant, the Project company will carry out microplastic analysis in their treated wastewater prior to channeling it to KIP WWTP and compare the result with microplastic concentration in the clean water supply from KIP;
- Other environmental impact potentially generated from the Project activities ie. noise, liquid and solid waste (non-hazardous and hazardous) will be managed in accordance with the ESMP in this ESIA and also detail RKL – RPL document for the Project activities;
- The presence and operations of KIP is expected to provide work opportunity for the surrounding community and the Kendal regency. KIP has been in collaboration with the Kendal Regency and Ministry of Industry create Link or Match Program that connects vocational and industry within a framework that includes curriculum alignment. Up to May 2022, the Link and Match Program has successfully conducted training for 300 workers.

Summary of degree of impact significance during pre-construction, construction, and operational phase is shown in **Table 9.1** below.

Table 9.1 Summary of Degree of Impact Significance

No	Impact	Pre- Construction and Construction	Operation
21.	Land Acquisition	Minor	Not scoped into assessment
22.	Economic Displacement	Minor	Not scoped into assessment
23.	Economic Opportunities	Minor	Not scoped into assessment
24.	Land Clearing and Reclamation	Minor	Not scoped into assessment
25.	Land Use	Minor	Not scoped into assessment
26.	Soil and Groundwater	Not scoped into assessment	Minor
27.	Water Management	Minor	Minor
28.	Traffic Management	Minor	Not scoped into assessment
29.	Ambient Air Quality	Minor	Not scoped into assessment
30.	Air Emission	Not scoped into assessment	Moderate
31.	Odour	Not scoped into assessment	Minor
32.	Waste Management	Minor	Minor
33.	Occupational Health and Safety	Moderate	Moderate
34.	Community Health and Safety	Minor	Minor
35.	Third Party Supplier Occupational Health and Safety	Not scoped into assessment	Major
36.	Employment	Minor	Minor
37.	Energy	Minor	Not scoped into assessment
38.	Noise	Minor	Minor
39.	Scattered Plastic Bottle	Not scoped into assessment	Minor
40.	Climate Change	Moderate	Moderate

9.2 Recommendation

ERM understands that the Client will develop an Integrated Management System (IMS) specific for the Project. The IMS should consider the following specific performance standards so that the requirement under the management system and procedures can comprehensively cover the Project activities from the pre-construction up to operation phase:

- The Client to develop and obtain approval on Detail Environmental and Monitoring Plan (*RKL-RPL Rinci*) document in order to mitigate the identified potential environmental impact and comply with the national regulation.
- The Client to implement ESMP to complement compliance with GIIP as required by IFC PS;
- Develop Human Resources Policy at the Project level to be aligned with the requirements of IFC PS include the specific requirements:
 - Standardized employment contract as per the provision of the Act no 11 of 2020 and Kendal Regency minimum wage regulation in respective year for all workers;
 - Vulnerable group including gender safeguards to be implemented which will include (but not be limited to):
 - Provision of equal opportunity;
 - Requirements for pregnant women and lactating mothers in regards to workplace conditions; and
 - Inclusion of gender-based indicators across operations (over and beyond employment) including the number of female workers that have been employed and have benefited from livelihood impact.
 - The Human Resources Policy to align with AGA's Corporate ESMS HR Policy which already covers IFC PS's requirements.
- The Client need to take measures with the third parties supplier to adhere the established code of conduct and formulating the formal monitoring mechanism to prevent child and forced labor. Improvement on Health and safety standards also need to be improved including physical and procedural actions.

APPENDIX C NATIONAL APPLICABLE REGULATION

Legislation	Year	Concerning	Relevance to Project Activities (Pre-construction, Construction, and/or Operations)
Environmental Aspect			
<i>Environmental Impact Assessment/EIA (AMDAL)</i>			
Act of the Republic of Indonesia No. 32	2009	Environmental Protection and Management	All activities
Act of the Republic of Indonesia No. 11	2020	Job Creation	All activities
Regulation of the Minister of Environment of the Republic of Indonesia No. 17	2012	Guidelines for community involvement in the process of AMDAL and Environmental Permit	All activities
Minister of Environment and Forestry Regulation No 4	2021	List of Businesses and/or Activities Required to Have Environmental Impact Analysis, Environmental Management Efforts and Environmental Monitoring Efforts or Statement of Ability to Manage and Monitor the Environment	All activities
Regulation of The Government No. 22	2021	The Organization of Environmental Protection And Management	All activities
Regulation of the Minister of Environment No. 26	2018	Guidelines for the preparation and assessment as well as environmental documents verification in the implementation of integrated business licensing electronically	All activities
Minister of Environment and Forestry Regulation No. 3	2021	Standards for Business Activities in the Implementation of Risk-Based Business Licensing for the Environment and Forestry Sector	All activities
Minister of Environment and Forestry Regulation No. 5	2021	Procedure for Issuing Technical Approval and Operational Eligibility Letter for Environmental Pollution Control	All activities
Act No.5	1960	Agrarian	All activities

Legislation	Year	Concerning	Relevance to Project Activities (Pre-construction, Construction, and/or Operations)
Act of the Republic of Indonesia No.41	2009	Protection of sustainable agricultural land	All activities
Regulation of the Minister of Agrarian No 13	2021	Implementation of the Suitability of Space Utilization Activities and Synchronization of Spatial Utilization Programs	All activities
Government Regulation No.24	2018	Online Single Submission	All activities
Regulation of the Minister of Agrarian No 5	2015	Location Permit	Pre-construction
President Regulation No. 36	2005	Land acquisition for the implementation of development for the public interest	Pre-construction
<i>Air Pollution</i>			
Regulation of The Government No. 22	2021	The Organization of Environmental Protection And Management	All activities
Decree of the Minister of Environment No.50	1996	Odour level	All activities
Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number 11	2021	Engine Emission Quality Standard With Internal Combustion	All activities
<i>Noise Emission</i>			
Minister of Environment and Forestry Decree (Kepmen LHK) No. KEP48/MENLH/11/1996	1996	Noise Level Standard	All activities

Legislation	Year	Concerning	Relevance to Project Activities (Pre-construction, Construction, and/or Operations)
Regulation of The Minister of Manpower of The Republic of Indonesia No. 5	2018	Occupational Health and Safety in the Work Environment	All activities
<i>Wastewater and Produced Water</i>			
Regulation of the Minister of Environment and Forestry Number P.68/MENLHK/SETJEN/KUM.1/8/2016	2016	Domestic Wastewater Quality Standard	All activities
Minister of Environment and Forestry Regulation No. 5	2014	Wastewater Quality Standard	All activities
Minister of Environment and Forestry Regulation Number P.21/MENLHK/SETJEN/KUM.1/7/2018 Year 2018	2018	Amendment to the Regulation of the Minister of the Environment Number 5 of 2014 concerning Wastewater Quality Standards	All activities
Regulation of The Government No. 22	2021	The Organization of Environmental Protection And Management	All activities
<i>Hazardous and Toxic Waste Management</i>			
Minister of Environment and Forestry Regulation (Permen LHK) No. 14	2013	Symbol and Label for Hazardous and Toxic Waste	All activities
Minister of Manpower Decree No. 187	1999	Hazardous chemical material management in the workplace	All activities
Minister of Environment and Forestry Regulation (Permen LHK) No. 3	2008	Procedures for Issuing Symbols and Labels for Hazardous and Toxic Materials	All activities

Legislation	Year	Concerning	Relevance to Project Activities (Pre-construction, Construction, and/or Operations)
Regulation of The Minister of Environment and Forestry No. 19	2021	Procedures for the Management of Non-Hazardous and Toxic Waste	All activities
Minister of Environment and Forestry Regulation No. 6	2021	Procedures and Requirements for Hazardous and Toxic Waste Management	All activities
<i>Soil Contamination and Remediation</i>			
Regulation of The Government No. 22	2021	The Organization of Environmental Protection And Management	All activities
Minister of Environment and Forestry no. 101	2018	Remediation of Land contaminated with hazardous and toxic waste	All activities
<i>Biodiversity</i>			
Act No. 5	1990	Conservation Of Biological Resources And Their Ecosystems	All activities
Act No. 5	1994	Ratification of United Nations Convention on Biological Diversity	All activities
Act No. 41 of 1999 as Amended by Government Regulation in Lieu of Law Number 1 of 2004 and Law Number 11 of 2020 and as Partially Revoked by Law Number 18 of 2013	1999	Forestry	All activities
Government Regulation No. 7 of 1999 Minister of Environment and Forestry Regulation No. 20 of 2018 on Minister of Environmental and Forestry Regulation No.P.106/MENLHK/SETJEN/KUM.1/8 of	1999	Concerning Preservation of wild Plant and Animals, Flora and Fauna Conservation, and Flora Fauna Protection Species	All activities

Legislation	Year	Concerning	Relevance to Project Activities (Pre-construction, Construction, and/or Operations)
2018 on Second Amendment on Minister Regulation No.P.20/MENLHK/SETJEN/KUM.1/6 of 2018			
Government Regulation No. 28 of 2011 and its amendment regulation of Government Regulation No. 108 of 2015	2011	Natural Reserve and Natural Conservation Area Management	All activities
Minister of Environmental and Forestry Regulation No.94/MENLHK/SETJEN/KUM.1/12/2016	2016	Invasive Species	All activities
Energy			
Government Regulation No. 17	2014	National energy policy	All activities
President Regulation No. 4	2016	Acceleration of the development of electricity infrastructure	All activities
Decree of the Minister of Energy and Mineral Resources No. 5899	2016	Ratification of the PT PLN electricity supply business plan of 2016 - 2025	All activities
Regulation of the Minister of Energy and Mineral Resources of the Republic of Indonesia No. 22	2019	Guidelines for the Implementation of Greenhouse Gas Inventory and Mitigation in the Energy Sector	All activities
Social Aspect			
Labour			

Legislation	Year	Concerning	Relevance to Project Activities (Pre-construction, Construction, and/or Operations)
Act of the Republic of Indonesia No. 13	2003	Employment	Construction and Operations
Act of the Republic of Indonesia No. 11	2020	Job Creation	All activities
Act of the Republic of Indonesia No. 21	2000	Workers' Organization/Labour Union	Operations
Government Regulation No. 35	2021	Temporary Employment Agreement, Outsourcing, Working Hours and Breaks and Termination of Employment Relationships	Operations
Government Regulation No. 36	2021	Wage	Construction and Operations
Regulation of Minister of Manpower No. 5	2021	Procedures for the Implementation of Work Accident Insurance, Death Benefit, and Old Age Security Programs	Construction and Operations
Occupational Health and Safety			
Act of the Republic of Indonesia No. 1	1970	Occupational Health and Safety (OHS)	All activities
Government Regulation No. 15	2012	Implementation of Occupational Health and Safety Management System (OHSMS)	Construction and Operations
Regulation of Ministry of Manpower No. 4	1987	OHS Committee	Construction and Operations
Regulation of Ministry of Manpower No. PER.02/MEN/1992	1992	Procedures Appointing OHS Specialist' Obligation and Authority	Construction and Operations
Regulation of Ministry of Manpower No. PER.03/MEN/1998	1998	Guidelines of Accident Reporting and Checking	Construction and Operations

Legislation	Year	Concerning	Relevance to Project Activities (Pre-construction, Construction, and/or Operations)
Regulation of Ministry of Manpower No. 5	2018	Occupational health and safety of workplace environment	Construction and Operations
Regulation of Ministry of Manpower and Transmigration No. 8	2010	Personnel Protection Equipment	Construction and Operations
Regulation of Ministry of Manpower No. 15	2008	First aid response during incident in the workplace	Construction and Operations
<i>Human Rights and Community Relations</i>			
Act of the Republic of Indonesia No. 39	1999	Human Rights	All activities
Law of the Republic of Indonesia No. 11 of 2020 (Omnibus Law) Article 9 /17/(5)	2020	Corporate Social and Environment Responsibility for Limited Company	All activities
Regulation of Ministry of Environment No. 17 of 2012	2012	Guidelines for community engagement in the environmental impact analysis process and environmental permit	All activities
<i>Land Acquisition</i>			
Government Regulation No. 19	2021	Implementation of Land Procurement for Development in the Public Interest	Pre-construction
Presidential Decree No. 62	2018	Handling Social Impact of Land Acquisition for National Development	Pre-construction
Regulation of Minister of Home Affairs No. 52	2014	Guidelines for Recognition and Protection of Indigenous and Tribal Peoples	All activities
<i>Cultural Heritage</i>			

Legislation	Year	Concerning	Relevance to Project Activities (Pre-construction, Construction, and/or Operations)
Law of the Republic of Indonesia No. 11 of 2010	2010	Cultural Heritage	All activities
Law of the Republic of Indonesia No. 5 of 2017	2017	Cultural Advancement	All activities
Law of the Republic of Indonesia No. 11 of 2020 (Omnibus Law) Article 9 /17/(5)	2020	Cultural Conservation	All activities

Governance Aspect

Corporate Governance

Regulation of Financial Service Authority No. 21 /POJK.04/2015 of 2015	2015	Provides a guideline for a public company to implement good corporate governance (GCC).	All activities
Circular Letter of Financial Service Authority No. 32 /SEOJK.04/2015	2015	Elaborates the scope of GCG that covers investor relations, function and role of board of commissioner and directors, stakeholder participation, and information disclosure.	All activities

Ethics

Regulation of Minister of Communication and Information Technology No. 20	2016	the Protection of Personal Data in the Electronic System (Requires the company's electronic system operator to have internal rules for personal data protection)	All activities
Circular Letter of Financial Service Authority No. 32 /SEOJK.04/2015	2015	the Guidelines of Good Corporate Governance on Public Company (Recommends the establishment of a company policy on anti-corruption and fraud as part of the recommended actions for GCC)	All activities

Legislation	Year	Concerning	Relevance to Project Activities (Pre-construction, Construction, and/or Operations)
Act No. 7	2017	General election (Sets the maximum amount of campaign funds allowed from corporates as 25 billion rupiah)	All activities
Act No. 7	2006	Ratification of United Nations Convention Against Corruption, 2003.	All activities

**APPENDIX D PROPOSED STEP AND APPROACH FOR PROJECT
DISCLOSURE AND COMMUNICATION**

Information Disclosure Planning

The Project will develop disclosure materials available to stakeholders via the communication channels outlined in Table below. Other effective communication networks in the local communities identified throughout the Project lifecycle will be utilized whenever possible.

Information Disclosure Plan

Targeted Stakeholders	Information Disclosure Channels
Kendal Industrial Park Management	KIP Management Office Mailing lists Meetings
Project Affected Persons	Appointed personnel to manage Stakeholder engagement and management KIP Community Liaison Officers (CLOs) or CSR staff KIP Management Office Local Government Office
Government Agencies	Mailing lists Meetings/ briefings Other channels listed below
Other Interested Parties	District schools and health clinics District and municipality offices Interest groups and local NGOs' networks Media (Online news, newspapers, TV) Project Website – All stakeholders can access Project information materials Project Information Hotline and Project Email – All stakeholders can provide feedback, ask questions, raise concerns/ issues

Disclosure events (time and place) may be communicated to all stakeholders via the following means and methods:

1. Community Relations Officers (CLOs)
2. District administration office notice boards

Communication Procedure

A number of communication methods may be utilised to reach a wide range of stakeholders. These are summarised in Table below.

Key disclosure and consultation materials include:

- **Project Information Document (PID):** This document consists of a non-technical summary of the Project, development timeline and milestones, Project updates, consultation program and opportunities for the stakeholders to participate in development of the Project, timeline and venues for engagement activities, contact details for questions and queries. The PID will be updated at each Project milestone to reflect the Project development and key activities at each stage.
- **Project Factsheet:** A one-pager in Indonesian explaining the Project information in simple, plain language accompanied with maps and pictures. The Project Factsheet aims to provide a summary of the Project only while the PID will include other information such as Planning and Approval activities and timelines, consultation process, project update, etc.
- **Frequently Asked Questions (FAQs)** which comprises of key Project risks and issues, and Project's plan to address them, as well as answers to key questions raised by the stakeholders during the previous consultation. The FAQs will be revised and updated quarterly (and as required) to reflect Project development and key issues that have come to light.

- Grievance Redress Mechanism (GRM): Details on how to access the grievance mechanism will be provided. This will include information on how the grievance management process will work, including the timeframes for responses.

Communication Methods

Method	Description	Targeted Stakeholder Groups
Project Information Sheets	<ul style="list-style-type: none"> ■ Booklet, PID, FAQs, GRM, Brochures, Factsheets, media notices, Feedback Form ■ Distributed by CLOs prior to meetings ■ Provide reference on impacts and mitigations section – may be included in booklet or provided verbally ■ Document to be translated to Indonesian 	All Stakeholders
Feedback Mailboxes	<ul style="list-style-type: none"> ■ To be placed in a public place at each village ■ Copies of feedback form are also available. ■ Allows local community members to provide written feedback 	PAPs Vulnerable Groups
Frequently Asked Questions (FAQ) List	<ul style="list-style-type: none"> ■ Prepare a list of FAQs and model answers to provide consistent messaging to all stakeholders ■ FAQs to be prepared in consultation with the PPP ■ To be updated regularly throughout the Project lifecycle ■ Ensure FAQ language is inclusive – simple, in appropriate language (e.g. Indonesian) ■ Ensure detail in FAQ does not provide commitments where not confirmed 	All Stakeholders
Project Website	<ul style="list-style-type: none"> ■ Project website to contain key Project information ■ Regularly updated with new Project updates such as job opportunities for local workforce, compensation and resettlement process ■ Allow the public to submit issues or grievances related to the Project development. 	All Stakeholders

APPENDIX E PROPOSED METHOD AND APPROACH FOR GRIEVANCE PROCEDURE AND RESOLUTION

The Grievance Resolution System

The objective of this system is to ensure there is a robust and transparent process available for addressing complaints. This system comprises a sequential process of three (3) levels of resolution. The next level of resolution is triggered if the complaint cannot be resolved at a lower level, although the Project recognizes and accepts that complainants may go directly to Level 3 to lodge complaints. Table below explain the sequential of grievance resolution system.

Project Grievance Resolution System

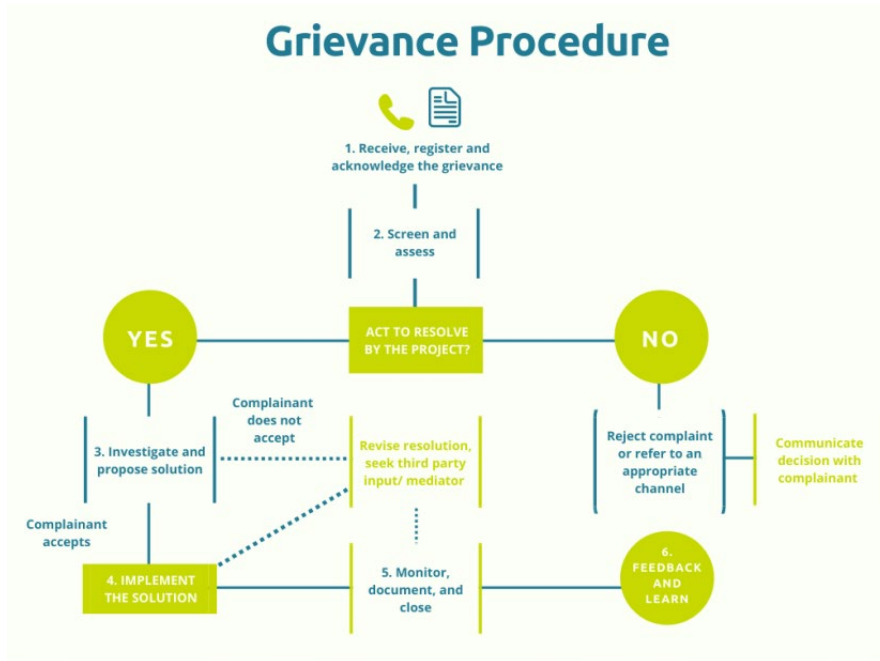
Tier	Detail
Tier 1	This level of resolution is for complaints that can be resolved by the Project directly with the complainant. This level of complaint can be dealt with through immediate corrective action.
Tier 2	If the complainants are not satisfied with the resolution proposed by the Project, they can appeal to the Project Grievance Committee
Tier 3	If the complainants do not accept the resolution or decision at level 2 then they can take legal action at the District Court. The Project does not control this level of resolution but acknowledges this process is available to stakeholders. It also acknowledges that some complainants may choose to proceed directly to this level of resolution.

The Community Grievance Procedure

All grievances including land acquisition and/or community engagement related complaints shall be managed in accordance with the established External Grievance Redress Procedure from ALBA Group. All grievances must be handled in a discreet and objective manner. The Community Grievance Officer (CGO) must take into consideration the sensitive nature of the needs and concerns of the affected communities and be responsive to the grievances made by the Project-Affected Parties, especially during the peak of the construction period.

All grievances and how they have been managed will be recorded in the Stakeholder Engagement Database including complaint details, a summary of the grievance, the resolution or agreement on proposed actions (between the Project and the complainant), and monitoring actions taken in response to the grievance. All correspondence related to the grievance must be documented in the Stakeholder Engagement Database for monitoring, reporting, and learning. This will help drive continual improvement.

It is to be advised that the implementation of grievance mechanism will be cooperate or combine with existing KIP grievance mechanism. The Project will be disclosed and consult with the KIP CSR department regarding the plan for grievance mechanism. The CSR department of KIP already assigned one dedicated local CLO as the focal point of the grievance mechanism. KIP management is committed to support its tenants in term of social performance and mitigation including the grievance mechanism.



Grievance Procedure

The six primary steps of the grievance procedure is summarized below.

Primary Steps of Grievance Procedure

Step	Description	Duration								
Step 1: Receive and Acknowledge Grievance	<ul style="list-style-type: none"> ■ A variety of methods will be available through which stakeholders can lodge grievances. This will include: ■ Verbal communication with a CLO. For those who have difficulty reading or writing or inexperienced with the complaint process the CLOs will assist them in filling out the Grievance Form. ■ Written communication by filling out the Grievance Form provided by the CLOs. The form will also be made available at the Project Information Centre, and other disclosure venues identified in the ESIA consultation. ■ The CLO will assign a unique grievance number to each grievance for easy tracking. Grievances for highly sensitive cases, and as requested by complainants, will be filed anonymously, which is essential for capturing any grievances that may arise in relation to gender-based violence (GBV) and sexual exploitation and abuse (SEA). ■ The CGO will provide the complainant with a verbal acknowledgement of the receipt of the complaint within 3 working days (phone call, text message, or a meeting) and a written acknowledgement within 7 days (email, letter). The acknowledgement will include the grievance number so the complainant can use as reference to track the status of their complaint. If the grievance is not well understood or if additional information is required, clarification should be sought from the complainant during this step. 	3-7 days								
Step 2: Assess Grievance and Assign Priority and Responsibility	<ul style="list-style-type: none"> ■ Grievance is screened and assessed within 7 days of receipt by CGOs as follows: ■ If it is decided that a grievance is not valid (by CR Manager), the grievance will be dismissed and advice of the decision and the reasons for dismissal will be provided to the complainant in writing (and in person if required). Where applicable, the Project will refer the complainant to a government department, organisations, or judicial committee within the local government. ■ If the grievance is valid, it will be classified in to one of the following categories: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Complaint Level</th> <th style="text-align: center;">Detail</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Level 1 Complaint</td> <td> <ul style="list-style-type: none"> ■ A complaint where potential impacts and/ or consequences are low that can be resolved quickly (e.g., a Project vehicle damaging a household's fence) </td> </tr> <tr> <td style="text-align: center;">Level 2 Complaint</td> <td> <ul style="list-style-type: none"> ■ A complaint which is widespread and repeated (e.g., dust from Project vehicles) </td> </tr> <tr> <td style="text-align: center;">Level 3 Complaint</td> <td> <ul style="list-style-type: none"> ■ A complaint that could potentially result in a serious breach of National laws and regulations or affect Government and Project image and performance (e.g., inadequate waste management). </td> </tr> </tbody> </table>	Complaint Level	Detail	Level 1 Complaint	<ul style="list-style-type: none"> ■ A complaint where potential impacts and/ or consequences are low that can be resolved quickly (e.g., a Project vehicle damaging a household's fence) 	Level 2 Complaint	<ul style="list-style-type: none"> ■ A complaint which is widespread and repeated (e.g., dust from Project vehicles) 	Level 3 Complaint	<ul style="list-style-type: none"> ■ A complaint that could potentially result in a serious breach of National laws and regulations or affect Government and Project image and performance (e.g., inadequate waste management). 	Within 7 days
Complaint Level	Detail									
Level 1 Complaint	<ul style="list-style-type: none"> ■ A complaint where potential impacts and/ or consequences are low that can be resolved quickly (e.g., a Project vehicle damaging a household's fence) 									
Level 2 Complaint	<ul style="list-style-type: none"> ■ A complaint which is widespread and repeated (e.g., dust from Project vehicles) 									
Level 3 Complaint	<ul style="list-style-type: none"> ■ A complaint that could potentially result in a serious breach of National laws and regulations or affect Government and Project image and performance (e.g., inadequate waste management). 									

Step	Description	Duration
	<ul style="list-style-type: none"> ■ CR Manager will be notified of all grievances and the General Manager (from Joint Project Management Unit (PMU) is notified of all Level 3 grievances. ■ CGOs will initiate resolution for Level 1 complaints where potential impacts and consequences are relatively low (e.g., construction truck damages local villager's fence). ■ CR Manager will initiate resolution of all complaints at levels 2 and 3 and level 1 complaints that can have significant implications to the business image or performance. ■ For any grievance that requires the involvement of a third party (e.g., technical expert, authority), Community Relations Manager is responsible for contacting the relevant third party for their advice or resolution. 	
<p>Step 3: Investigate and Propose Resolution</p>	<ul style="list-style-type: none"> ■ Responsible CGO or CR Manager will investigate the grievance and propose resolution as soon as possible but no later than 14 days after Step 2. The responsible CGO/ CR Manager shall seek input from relevant municipality/ district officials, village chiefs as well as Project personnel and Construction Contractors, as necessary. ■ The responsible CGO/ CR Manager will discuss the outcomes of the investigation, and proposed resolution with the complainant. The response can be communicated in several ways depending on the complainant's preference (e.g., face to face, email, letter, phone call, etc.). ■ The CGO/ CR Manager will ask the complainant for written acceptance of the resolution (or verbal if the complainant has difficult reading/ writing). ■ For grievances assessed as a 'level 1', a CGO will contact the complainant directly to develop solutions with oversight from the CR Manager ■ For a grievance assessed as a 'level 2,' the CR Manager will be responsible for identifying a coordinated management solution and response. This should involve other senior managers and sign off from the General Manager. ■ For a grievance assessed as a 'level 3,' immediate intervention of related parties such as senior managers, contractor/s, and/or local authorities to seek their advice on potential resolutions. ■ The response is signed-off by the PMU for level 3 grievances and the CR Manager for Level 2 and Level 1. 	<p>No later than 14 days from Step 2</p>
<p>Step 4: If the Complainant does not accept the Proposed Resolution</p>	<p>If the complainant does not accept the proposed solution the responsible CGO/ CR Manager shall refer to the Project Grievance Committee to facilitate an agreeable resolution (Tier 2 of the Grievance Resolution System). And finally, as the last resort, they can appeal at District Court (Tier 3).</p>	<p>15 days from grievance lodge</p>

Step	Description	Duration
	<p>For community engagement grievances, if the complainant is not satisfied with the decision at Tier 1; the grievance will be forwarded to the Joint Grievance Committee for their necessary action (Tier 2). Contact details of the Committee will be provided to affected persons, and community and posted in the public places. Joint Grievance Committee for the Project will carry out a holistic review of the grievance and may also conduct a field visit to meet the aggrieved affected person to gather relevant details. The Joint Grievance Committee for the Project will issue a written response and convey the decision to the aggrieved person within 15 working days from the date that the grievance is lodged. If more time is needed for the matter to be resolved or to be escalated, the complainant will be accordingly informed.</p>	
<p>Step 5: Implement the Solution</p>	<ul style="list-style-type: none"> ■ For relatively simple, short-term actions that can resolve the problem, the objective will be for the solution to be implemented within 20 days after assessing the grievance. ■ For solutions that take longer to address, or for which the complainants are not satisfied, or additional corrective actions are required, the CGO will inform the complainants of the progress on a regular basis (weekly and as required) until the solution is completely implemented. ■ Inform the complainant once the resolution is implemented. The responsible CGO/ CR Manager will inform the complainant that the corrective actions have been implemented and confirm that the complainant is satisfied with the resolution. 	<p>20 or more days</p>
<p>Step 6: Grievance Close Out and Documentation</p>	<p>Monitor and document the grievance resolution process before closing the grievance with sign-off from the CR Manager and Project Director approval for all level 3 grievances. A grievance close-out form will be used. If further attention is required, the CGO/ CR Manager should return to Step 2 to re-assess the grievance.</p>	<p>Until closing of grievance</p>

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