



Environment and Social Impact Assessment - Executive Summary

China Huadian Engineering Co., Ltd

Huadian Dak Lak Wind Power Project, Dak
Lak Province, Viet Nam

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Paola Romero
Partner-in-Charge

ERM Vietnam

3rd Floor, Saigon Finance Centre
09 Dinh Tien Hoang, Dakao Ward
District 1, Ho Chi Minh City
Vietnam

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Acronyms and Abbreviations

AIIB	Asian Infrastructure Investment Bank
CHEC	China Huadian Engineering Co., Ltd
CIA	Cumulative Impact Assessment
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CN1	Cu Ne 1 Wind Power Project
CN2	Cu Ne 2 Wind Power Project
EHS Guidelines	World Bank Group Environmental, Health and Safety Guidelines
EPP	Environmental Protection Plan
ERM	ERM Vietnam Co. Ltd
ESAP	Environmental and Social Action Plan
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FGDs	Focused Group Discussions
GRM	Grievance Redressal Mechanism
IFC PSs	International Finance Corporation Performance Standards
KB1	Krong Buk 1 Wind Power Project
KB2	Krong Buk 2 Wind Power Project
KIIs	Key Informant Interviews
SEP	Stakeholder Engagement Plan

EXECUTIVE SUMMARY

1.1 Project description

China Huadian Engineering Co., Ltd (hereinafter as “Sponsor” or “CHEC” or the Project) is developing Huadian Dak Lak Wind Power Project (hereinafter as “the Project”) in Krong Buk District, Dak Lak Province. The Project comprises of four sub-projects namely Krong Buk 1 (KB1), Krong Buk 2 (KB2), Cu Ne 1 (CN1), and Cu Ne 2 (CN2) with total capacity of approximately 200 MW located in Cu Ne, Cu Pong, Ea Sin, Chu Kbo Communes. In order to manage and operate these Projects, the Sponsor established four subsidiary companies.

The intention approval of investment and the Investment Registration Certificate of four subsidiaries are obtained and issued by Dak Lak Province People’s Committee and Department of Planning and Investment. The Project also developed Environmental Protection Plan (EPP) and got EPP approval from Krong Buk District People’s Committee. An exemption approval for Construction Permit of the Project was also approved by Dak Lak Province Department of Construction.

The key components of the Project includes:

- Seventy-three (73) wind turbine with total capacity of 199.75 MW (55 with capacity of 2.65 MW and 18 with capacity of 3.0 MW);
- A 0.69/22 kV – 3000 kVA transformer
- Other 22 kV components
- 22 kV underground collector lines
- 22/220 kV substation
- 220 kV transmission line
- Management and operation house, and
- Access road and internal road systems.

At the time of developing this ESIA, the Project is under the construction phase in which the construction of eight turbine foundations is completed and the field levelling of the 22/220 kV substation, laydown area, and access roads is finished.

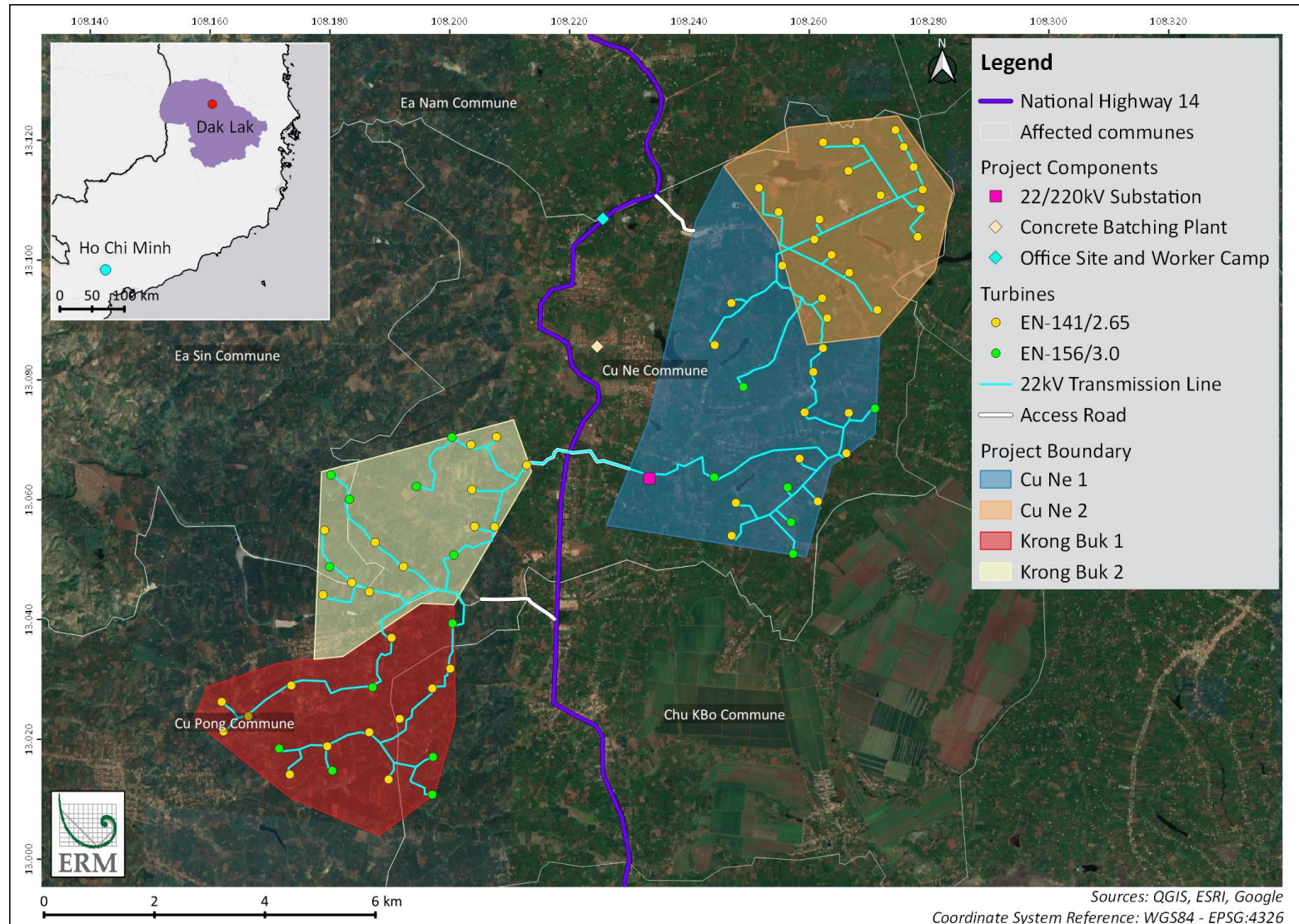


Figure 0.1 Project Location

ERM Vietnam (ERM) was commissioned by CHEC to undertake an Environmental and Social Impact Assessment (ESIA) Report for the execution and operation of the abovementioned Project. The ESIA aimed to assess Project-related impacts regarding environmental and social aspects against National Standard, Asian Infrastructure Investment Bank Environmental and Social Framework (AIIB ESF), International Finance Corporation Performance Standards (IFC PSs) and the associated World Bank Group Environmental, Health and Safety (EHS) Guidelines. The ESIA is prepared based on (i) information provided by CHEC including Feasibility Study (FS report), Environmental Protection Plan (EPP), (ii) desktop screening and literature review of internationally recognized sources; (iii) additional primary baseline surveys. The outcomes of the ESIA, including mitigation measures and monitoring plans, will be summarized in the Environmental and Social Management Plan (ESMP) to provide an overview of future environmental and social commitments of this Project.

The ESIA is comprised of three volumes, including:

Volume 1: Introduction to describe the Project Description with detailed information of its component and area; project alternatives to discuss alternatives in terms of power generation type, site selection and technology; applicable national regulations and international standards, the methodology used for the impact assessment and the scope of the ESIA report, and present the outcomes of the stakeholder engagement prior to and during the ESIA development.

Volume 2: Baseline Information to provide adequate environment, biodiversity, and socio-economic background information to identify key issues, and to present the outcomes of these related baseline surveys during the ESIA development.

Volume 3: Impact Assessment to assess the potential impacts and consequences related to each of the key receptors within the area. The assessment also identifies the significance of impacts based on the concept of all existing controls in place and recommends additional mitigation measures and monitoring to satisfy the requirements of AIIB ESF and other international guidelines.

Key findings of the ESIA process are shown below:

Environmental Context

The Project's area locates in a low mountain and hilly landform with a wide and gentle topography on the top of the mountain. That location is also covered by dense surface vegetation, mostly cash crops such as coffee, pepper, and rubber trees. The climate in Dak Lak Province splits into two sub-regions in which Northwest region is hot and dry whereas the Southeast is cool and pleasant.

The environmental baseline can be summarised as follows:

- **Air:** According to the Feasibility Study Report and the 2020 Dak Lak Province's Environmental Monitoring Report, the air quality monitoring result in the preliminary survey conducted by the Project's owner showed that the ambient air baseline quality is fairly good.
- **Noise:** The noise baseline survey was conducted by the ERM's subcontractor under the supervision of ERM in May 2021. Noise monitoring was conducted at six scattered locations in Krong Buk District, Dak Lak Province to evaluate the noise baseline within the Project's area. The monitoring results showed that most of night-time noise level exceeded IFC's limitation due to the sound of insects and dog barking, roosters crowing, cicadas chirping, children's voices, and karaoke singing.
- **Surface water:** According to the Feasibility Study Report and the 2020 Dak Lak Province's Environmental Monitoring Report, the surface water's quality at the area surrounding the Project site was in good condition with all parameters were measured under the thresholds regulated in National Technical Regulations on Surface Water Quality (QCVN 08-MT:2015/BTNMT) at column B1 of the limits for irrigation, water transportation, or other similar purposes. Although there are no major rivers traversing the Project's area, many small lakes and creeks are evenly distributed around Cu Ne and Cu Pong Communes.

- Groundwater: The Feasibility Study Report and the 2020 Dak Lak Province's Environmental Monitoring Report stated that the groundwater quality within and around the Project area has been in good condition. In addition, groundwater is also the main source for daily life and partly for crop irrigation during wet season of local people residing in Cu Pong Commune. The average depth of groundwater wells in Cu Pong Commune is recorded 18 – 20 m.
- Soil: According to the FS Report, the soil quality within and around the Project area is still in good condition with all soil parameters, particularly the heavy metals were under the threshold regulated in National regulation.

Biodiversity Context

This Project lies within the Southeaster Indochina Dry Evergreen Forests, which occupies an area of 124,320 km². There are four nationally protected areas and four key biodiversity areas situated within a 50km radius of the Project Area. Among 181 species potentially occur within the EAAA, six flora and four fauna species have been recorded in Dak Lak province. Numerous techniques were applied such as vantage point, transects, etc. in flora and fauna surveys. The results show that 202 flora species, 100 bird species, 7 bats species, 9 non-volant mammals, 27 herpetofauna species recorded within the Project area.

As a result, the EAAA covers an approximate area of 31,027 ha and all habitats within the EAAA are considered modified habitats due to human disturbance (e.g. plantations, built-up land).

Based on results from field surveys, no species triggered Critical Habitat within the Project area.

Social Context

The baseline study focused on four Project affected communes namely Cu Ne, Cu Pong, Ea Sin, and Chu Kbo with multi-method approach for data collection. Hence, besides collecting secondary data and conducting field observations, a number of stakeholder engagement activities were conducted in July 2021 that seek their concerns and expectations toward the Project development and form partnerships to promote constructive interaction between the Project and its stakeholders. The consultations comprised particularly:

- Meetings with local authorities at the provincial, district and commune levels;
- Fourteen Focused Group Discussions (FGDs) covered Mix, Ethnic Minority, Agro-forestry, Women, Wage and enterprise-based, and Vulnerable group
- Nineteen Key Informant Interviews (KIIs) covering representatives of Women's Union, Farmer's Union and Village Management Board, and
- A total of 144 household interviews conducted with affected households in Cu Ne, Cu Pong, Ea Sin and Chu Kbo communes.

The consultation results indicated that local authorities and communities supported the development of the Project and expected the Project Owner to follow their commitment to environmental and social mitigation measures. The social baseline survey identified Ede people in the Project area as Indigenous Peoples.

1.2 Impact Assessment

The outcomes of the impact assessment for each environmental, biodiversity and social aspect identified in the ESIA are summarised in the table below. A brief description of each aspect is provided hereafter.

Key impacts	Phase	Significance of Impact	
		Before Mitigation	With Mitigation
Environment			
Air quality	Pre-Construction	Minor	Negligible
	Construction	Minor	Negligible
	Operation	Negligible	Negligible
Noise Emissions	Construction	Moderate	Minor
	Operation	Major	Major
Water Resource – Quantity	Construction	Moderate	Minor
	Operation	Minor	Minor
Water Resource – Quality	Construction	Minor	Minor
	Operation	Minor	Minor
Soil – Compact and Erosion	Construction	Moderate	Minor
Soil – Contamination	Construction	Moderate	Negligible to Minor
	Operation	Minor	Negligible to Minor
EMF – 220KV Transmission Line	Operation	Minor	Negligible
EMF – 22KV Transmission Line	Operation	Minor	
EMF – Substation	Operation	Negligible	Negligible
EMF – Wind Turbine	Operation	Negligible	Negligible
Impact of Project's Activities to Climate Change	Operation	Positive Impact	
Impact of Climate Change to the Project	Operation	Minor	Negligible
Shadow Flicker	Operation	Major	Major to Moderate
Visual Impact	Operation	Moderate to Minor	Minor to Negligible
Traffic and Transport Impact	Construction	Minor	Negligible
Biodiversity			
Loss of Terrestrial Biodiversity (on habitat)	Both	Negligible	Minor to Negligible
Loss of Terrestrial Biodiversity (on species receptors)	Both	Moderate	Minor to Negligible
Disturbance to Terrestrial Species – Birds	Construction	Negligible	Negligible
Disturbance to Terrestrial Species – Bats	Construction	Negligible	Negligible

Key impacts	Phase	Significance of Impact	
		Before Mitigation	With Mitigation
Disturbance to Terrestrial Species –Non-volant Mammals	Construction	Negligible	Negligible
Disturbance to Terrestrial Species –Reptiles	Construction	Moderate	Negligible
Barrier Creation, Fragmentation and Edge Effect Impacts	Both	Negligible	Negligible
Degradation of Habitat Impacts caused by Dust	Both	Negligible	
Degradation of Habitat Impacts caused by Waste and Wastewater Management	Both	Negligible	
Invasive Species	Both	Negligible	Negligible
Mortality Impacts – Birds	Operation	Moderate	
Mortality Impacts – Bats	Operation	Minor	
Mortality Impacts – Other Fauna	Construction	Major	Negligible
Social			
Economic displacement and Loss of Livelihood due to Land Acquisition	Pre-Construction	Major	Minor
Disturbance to agricultural production	Construction	Moderate	Minor
Impacts on Worker Rights, Occupational Health and Safety	Construction	Moderate	Minor
Impact on Community Health, Safety and Security (Non-influx)	Construction	Moderate	Minor
Impacts Associated with Migrant Worker (Influx)	Construction	Minor	Negligible
General Disturbance to Local Community	Operation	Moderate	Minor
Relocation Impact Due to Health and Safety Reasons	Operation	Major	Minor
Positive Impacts on Local Employment and Community Development	Construction	Positive Impact	
Impacts on Indigenous Peoples	Construction	Moderate	Minor
	Operation		
Impacts on Gender	Construction	Minor	Minor
	Operation		
Impacts on Human Rights	Construction	Moderate	Minor

Key impacts	Phase	Significance of Impact	
		Before Mitigation	With Mitigation
	Operation		
Unplanned events			
Leakage and Spill Incidents	Construction	Moderate	Moderate to Minor
	Operation	Moderate	Minor
Traffic Accidents	Operation	Major	Major to Moderate
Fire and Explosion, including UXO	Construction	Major	Major to Moderate
	Operation	Major	Major to Minor
Occupational Health and Safety Accident	Construction	Moderate	Moderate to Minor
	Operation	Moderate	Moderate to Minor
Blade Throw	Operation	Major	Major to Minor
Transmission Line Snapping and Transmission Pylon Collapse	Operation	Major	Major to Moderate
Natural Hazards	Operation	Major	Major to Moderate

1.2.1 Air

The air quality condition will mainly be affected by increased dust and exhaust emissions due to pre-construction, construction activities and transportation of material and equipment during the construction phase. Subsequently, human receptors at nearby residential areas will be affected. The ESIA recommends some mitigation measures including watering, stockpile covering, vehicle and machinery maintenance. Once the mitigation measures are in place, the impact would likely be reduced from **minor** to **negligible**. During the operation phase, the potential impacts on air quality from operation activities are considered **negligible**, so no further assessment is needed.

1.2.2 Noise Emissions

In the construction phase, noise generated by construction activities and vehicle traffic potentially induces significant noise emissions. The impact significance is considered **moderate**. However, all existing controls and proposed mitigation measures are expected to reduce the impacts to **minor**.

During the operation, the wind turbine noise exposure can cause direct and negative effect such as disturbance and potential health impact on local people living in nearby residential areas for long-term period (20 years of operation in this case). The noise modelling and noise regression analysis are all performed to obtain the noise level results caused by the wind turbines' operation. Due to dense sensitive receptors residing within the noise buffer zone, the significance of noise-related impact is evaluated as **major** with the operational noise levels exceeded the standard. Further detailed of noise assessment and additional mitigation measures are presented in Section below to reasonably minimise the noise-related impact in terms of Project development.

1.2.3 Water Resource

Construction and worker's activities during the construction and operation phases potentially affected quantity and quality of the surface and ground water within the Project's area. Hence, the significance

of impact in terms of water quantity and quality during the construction phase has been assessed as **moderate** and **minor**, respectively. However, with proposed mitigation measures, the residual impacts would be anticipated to be **minor**.

During the operation phase, the residual impact caused by waste and wastewater discharge, small oil spillage after implementation of mitigation measures in place is assessed as **minor**.

1.2.4 Soil

Soil compact and erosion caused by construction activities not only affect local community but also cause influence to habitat of flora and fauna. Therefore, significance of impact is considered as **moderate**. With the implementation of the existing controls and additional mitigation and management measures, the residual impacts would be anticipated to be **minor**.

In addition, the impact significance of soil contamination due to improper waste disposal and leaks/spills is also assessed as **moderate** in construction phase and **minor** in operation phase, respectively. Hence, additional mitigation measures need to be applied to reduce the impacts to **negligible** to **minor**.

1.2.5 Electromagnetic Interference Impact

The significance of electromagnetic interference impact from transmission line (220kV and 22kV) is considered as **minor**, while the impact significances of substation and wind turbines are all assessed as **negligible**. The residual impacts of electromagnetic interference are expected to be **negligible** after applying mitigation measures.

1.2.6 Climate Change

While the Project Activities are considered having positive impacts on climate change during operation phase, the significance of impact on project activities caused by climate change is assessed as negative and **minor** during the construction phase. To address these negative impacts, many adaptation measures have been proposed and the residual impacts are expected to be **negligible**.

1.2.7 Shadow Flicker

The impact of shadow flicker during operation phase is considered to be **major**. Based on real case scenario modelling, 312 receptors will experience shadow flickering. The residual impact following the implementation of mitigation measures is still **major** or reduced to **moderate** depending on the efficiency of the implementation phase.

1.2.8 Visual Impact

The significance of visual impact that will result from the installation and operation of the wind turbines has been assessed as **moderate** to **minor** and expected to be reduced to **minor** or **negligible** respectively after implementing mitigation measures.

1.2.9 Traffic and Transport Impact

Traffic and transport issue in terms of the Project development is expected to cause disturbance to road networks and its users during the Projects' construction phase. Generally, the significance of this impact during the construction phase is considered as **minor**. With proposed mitigation measures, the residual impacts of traffic and transport is reduced to **negligible**.

1.2.10 Biodiversity

The Project's impacts on biodiversity are mainly considered **negligible** even before mitigation measures. However, the impacts of disturbance to reptiles and mortality impacts on birds, bats and other fauna are considered in the range of **minor** to **major**. After implementing mitigation measures,

the disturbance on reptiles and mortality impacts on other fauna are expected to be reduced to **negligible**.

1.2.11 Social Impacts

The overall impacts on the social aspect is **moderate** except for economic displacement impact from land acquisition, disruption to IP way of life, and potential relocation Impact due to health and safety reasons. Besides existing controls mentioned in EPP, FS report as well as Safe and Civilised Construction Plan, numerous mitigation measures have been proposed to reduce significance of impacts such as disclose information, develop grievance mechanism for community and worker, raise awareness about health and safety among workers, implement programs in order to restoring community livelihood in addition to developing community, etc.

1.2.12 Unplanned Events

The unplanned events that can potentially arise from the construction and operation phases of the project include blade throw, transmission tower collapse, fire accidents, explosion, spillage of oil, chemical and hazardous waste, traffic, and occupational health and safety accidents. Amongst, impacts from the concerned unplanned events can level up to **moderate** or even **major** significance in the worst-case scenario due to the potential injuries and / or fatalities regardless of the low likelihood of occurrence. For the unplanned events, the best practice mitigation measures would be to reduce the likelihood of occurrence. Upon effective implementation of the proposed measure, the impact significance of the unplanned events can reduce to **minor** level.

1.2.13 Cumulative Impacts

Cumulative environmental impacts have been assessed mainly related to biodiversity and social aspects. The Project Owner is recommended to comply strictly with mitigation measures proposed in ESMP in addition to facilitate a Cumulative Impact Assessment (CIA) association with other projects and government representation (such as Dak Lak Provincial People Committee) to govern a system for managing cumulative impacts. This system should seek guidance from Vietnam regulations (such as Vietnam Data Red Book) and Vietnam commitments to international treaties such as Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES);

1.3 Grievance Redressal Mechanism

Grievance Redressal Mechanism (GRM) is another critical component of effective stakeholder engagement. The purpose of GRM is to provide a forum to the internal and external stakeholders to voice their concerns, queries and issues with the project. Such a mechanism would provide the stakeholders with one project personnel or one channel through which their queries will be channelled and will ensure timely responses to each query. This will allow for trust to be built amongst the stakeholders and prevent the culmination of small issues into major community unrest. The GRM will be accessible and understandable for all stakeholders in the project and for the entire project life. The GRM will be communicated to all relevant stakeholders.

As stated earlier, a grievance is a concern or complaint raised by an individual or a group within communities affected by company operations. Both concerns and complaints can result from either real or perceived impacts of a company's operations, and may be filed in the same manner and handled with the same procedure. Grievances may take the form of specific complaints for actual damages or injury, general concerns about project activities, incidents and impacts or perceived impacts. Based on the understanding of the project area and the stakeholders, an indicative list of the types of grievances have been identified for the project, as can be seen below:

- External Grievances: Grievance from all related stakeholders in general and community grievances in particular; and

- Internal Grievances: Grievances from Employees (including both direct and indirect employees, including local workers and migrant workers through contractors).

It is noted that the Project Owner has developed the Stakeholder Engagement Plan (SEP) including Community and Worker Grievance Mechanism. This GRM in ESIA are to summarise while SEP describes detailed the needs, suggested mechanisms, monitoring, and reporting.

1.4 Conclusion

In general, the construction and operation of the Project will have negative impacts ranged from a **negligible to a major** significance prior to the implementation of the mitigation measures. Once all mitigation measures are applied, most of the residual impacts are minimised to **negligible**, with the exception of some impacts still remains **moderate**. In order to manage and mitigate such impact, the ESMP has been prepared which is the independent and enclosed material to this ESIA. As part of this ESIA report, a range of measures including specific environmental, health safety and social management plans have been developed to diminish the overall impacts to the acceptable levels and as low as reasonably practicable to ensure the compliance with the project's applicable standards. Gaps with the applicable standards that are not covered at this stage will be addressed through actions proposed in the Environmental and Social Action Plan (ESAP).

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ERM Vietnam

3rd Floor, Saigon Finance Centre
09 Dinh Tien Hoang, Dakao Ward
District 1, Ho Chi Minh City
Vietnam

T: +84 28 3914 7800

F: +84 28 3914 7801

www.erm.com