Environmental and Social Compliance Audit Report

Project Number: 56118-001
November 2022

Viet Nam: Binh Duong Waste Management and Energy Efficiency Project

Prepared by IBIS Environmental and Social Asia Consulting Pte. Ltd. for the Binh Duong Water Environment JSC and the Asian Development Bank.

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14 NOVEMBER 2022

FINAL REPORT

ENVIRONMENTAL & SOCIAL DUE DILIGENCE REPORT ON
BIWASE WASTE TREATMENT COMPLEX EXPANSION, VIET NAM

Binh Duong Province, Vietnam

Asian Development Bank

IBIS

FINAL REPORT

ENVIRONMENTAL & SOCIAL DUE DILIGENCE REPORT ON BIWASE WASTE TREATMENT COMPLEX EXPANSION, VIET NAM

For and on behalf of: Asian Development Bank

Location: Binh Duong Province, Vietnam

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Date: 14 November 2022

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ABBREVIATIONS

ABBREVIATIONS	
ADB	Asian Development Bank
AHs	Affected Households
BIWASE	Binh Duong Water Supply Sewerage Environment Limited Company
CAP	Corrective Action Plan
CEMS	Continuous Emission Monitoring System
CO	Carbon monoxide
CO_2	Carbon dioxide
CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women
DANIDA	Danish International Development Agency
DoNRE	Department of Natural Resources and Environment
E&S	Environmental and Social
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ERP	Emergency Response Plan
ESCA	Environmental and Social Compliance Audit
ESCAR	Environmental and Social Compliance Audit Report
ESDD	Environmental and Social Due Diligence
FSR	Feasibility Study Report
GIIP	Good International Industry Practice
GRM	Grievance Redress Mechanism
H&S	Health & Safety
IBAT	Integrated Biodiversity Assessment Tool
IBIS	IBIS Environmental and Social Consulting Asia Pte. Ltd.
ILO	International Labour Organisation
IRL	Information Request List
IPs	Indigenous peoples
JEGS	Japan Environmental Governing Standards

ABBREVIATIONS	
JICA	Japan International Cooperation Agency
MONRE	Ministry of Environment and Natural Resources
NH_3	Ammonia
NOx	Nitrogen oxides
O_2	Oxygen
OECD	Organisation for Economic Co-operation and Development
OHS	Occupational Health and Safety
PAC	Polyaluminum chloride
PAHs	Polycyclic Aromatic Hydrocarbons
PCP	Public Communication Policy
PPC	Provincial People's Committee
PPE	Personal Protective Equipment
RRR	Reputational Risk Review
SNCR	Selective Non-Catalytic Reduction
SOx	Sulphur oxides
SPS	ADB Safeguard Policy Statement
tpd	tonnes per day
WBG	World Bank Group
WEEE	Waste Electrical and Electronic Equipment
WtE	Waste-to-Energy
WWTP	Wastewater treatment plant

1 INTRODUCTION

1.1 BACKGROUND

IBIS Environmental and Social Consulting Asia Pte. Ltd. ("IBIS") was engaged by Asian Development Bank ("ADB" or "the Client") to act as an Independent Environmental and Social ("E&S") Consultant ("the Consultant") to carry out an Environmental and Social Compliance Audit ("the Audit" or "ESCA") of new developments to be funded by ADB ("the Project") within the existing South Binh Duong Waste Treatment Complex ("the Site" or the "Waste Treatment Complex") located in Binh Duong Province, Viet Nam.

Binh Duong province has one of the highest rates of urbanisation and industrialisation in Viet Nam, which has resulted in a significant increase in waste generation. Solid waste treatment is an acute problem in the Binh Duong Province; only part of domestic waste generated is collected, recycled and reused in industrial facilities, and most of the industrial solid waste is dumped indiscriminately on vacant lots, or is incinerated by companies themselves, causing environmental pollution as well as land and air quality degradation in the area. The South Binh Duong Solid Waste Treatment Complex is owned and operated by Binh Duong Water Environment Joint Stock Company ("BIWASE"), formerly known as Binh Duong Water Supply Sewerage Company, which was established in 2005. It is the sole facility in the Binh Duong Province tasked by the Binh Duong Provincial People's Committee (PPC) to collect and treat the province's waste including domestic waste, industrial waste, medical waste and hazardous waste. Although the waste treatment plant has been in operation since 2005, its current capacity falls short of the demand for solid waste collection and treatment in the province and therefore requires expansion.

The Site currently has a waste treatment capacity of 6,216.8 tonnes per day (tpd) through a combination of waste treatment technologies including sanitary landfill (which incorporates biogas recovery and leachate treatment), composting, WtE / incineration, wastewater treatment, an aggregate recovery facility, a distillation treatment and solvent recovery system, waste solidification, Waste Electrical and Electronic Equipment (WEEE) dismantling, and waste shredding.

The Project is an expansion of the treatment capacity of the Site through the development of a WtE plant of 8,400 kg/h or 201.6 tpd capacity, and a new composting facility of 840 tpd capacity, which are to be funded by ADB. The addition of these will increase the capacity of the Site by an additional 391.58 tpd of processing to a total of 6,608.38 tpd. The capacity expansion is within the existing physical footprint of the Site, as such there is no expansion to the Site boundary as a result of the Project.

Based on currently available information, the Site receives waste from a combination of municipal and private clients, under contract. Feedstock for the WtE facility will be 201.6 tpd derived from higher calorific value residues from the mixed municipal waste inputs to the Site. The composting facility will have a waste throughput of 840 tpd and it is understood that this waste is provided by Binh Duong Province, under a contract arrangement. The purpose of the Project is to meet the increasing demand

for waste treatment capacity in Binh Dong Province. A detailed description of the existing Site, its operations, and the Project is provided in *Chapter 2*.

Based on the Feasibility Study Report[1] (FSR), the total expansion cost is estimated at VND 724 billion (approximately US$31 million), of which the WtE facility accounts for VND 350 billion (approximately US$15 million) and the composting plant accounts for VND 374 billion (approximately US$16 million). If approved to proceed, ADB will provide corporate financing to BIWASE of up to US$30 million to finance the construction and operation of the expansion facilities (i.e. one WtE of 8,400 kg/h or 201.6 tpd capacity and a new composting facility of 840 tpd capacity). At the time of writing, construction of the Project is ongoing. The new WtE plant has been built, completed and licensed to put into operation (under the hazardous waste treatment license code HW: 1-2-3-4-5-6.028.VX, December 17, 2021) with the auxiliary works for heat recovery of combustion for power generation under construction and expected to be completed in December 2022.The compost facility had its EIA approved in June 2022 and is currently under construction, with construction expected to be completed by second quarter 2023.

1.2 REPORT STRUCTURE

This report documents the findings of the Audit and is structured in the following manner:

- ***Chapter 1 Introduction*** provides a brief introduction to the Project and outlines the Audit report structure;
- ***Chapter 2 Project Setting and Description*** provides background information of the Project, including its location, current status, and key activities at the Site;
- ***Chapter 3 Scope of Work*** describes the objectives, scope of work, methodology, and key tasks undertaken as well as applicable and relevant requirements for the Project, i.e. the Applicable Standards;
- ***Chapter 4 Environmental and Social Compliance Review of BIWASE Corporate ESMS*** details the observations and findings made during the Audit and corresponding proposed corrective actions;
- ***Chapter 5 Environmental and Social Compliance Review of Facility*** details the observations and findings made during the Audit and corresponding proposed corrective actions;
- ***Chapter 6 Conclusion and Corrective Action Plan*** summarises the Audit findings and proposes corrective actions in a consolidated tabular format; and
- ***Annexes*** provide supplementary information collected during the course of the Audit, including a list of key documents reviewed during the course of the Audit (*Annex A*), a list of interviewees

[1] Feasibility Study Report (file name: *VIE BDMSW WtE_FSR 2021_ENG (updated 11 Jan)-clean*); received 20 May 2022.

(*Annex B*), a reputational risk review (*Annex C*), photographs taken at the Site in June 2022 (*Annex D*), a summary of the relevant Vietnamese legal requirements (*Annex E*), samples of responses to the community questionnaires (*Annex F*) and air quality monitoring results (*Annex G*).

1.3 LIMITATIONS

The work was carried out in general accordance with IBIS' agreement with ADB Contract No. S177832.

All conclusions and recommendations made represent the professional opinions of the IBIS consultants involved with the project, and the results of this report should not be considered a legal interpretation of existing regulations or misconstrued as legal advice. The ESDD findings may include application of judgment based on the use of the Applicable Standards as such may be based on subjective interpretation.

IBIS assumes no responsibility or liability for errors in the public data utilised, information provided by BIWASE/the Project, or statements from sources outside of IBIS, or developments resulting from situations outside the scope of this assignment. We make no warranties, expressed or implied, including, without limitation, as to merchantability or fitness for a particular purpose.

All data and information provided were assumed to be accurate and up to date.

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2 PROJECT SETTING AND DESCRIPTION

The Project, for which ADB is considering providing corporate financing, involves the construction and operation of a Waste-to-Energy (WtE) facility (8,400 kg/hour or 201.6 tpd) and composting plant (with a processing capacity of 840 tpd) at BIWASE's existing Waste Treatment Complex located at Quarter 1B, Chanh Phu Hoa ward, Ben Cat town, Binh Duong province, about 25 km north of Thu Dau Mot town. The expansion is situated within the existing footprint of the Waste Treatment Complex, which was first developed in 2004. BIWASE's existing Waste Treatment Complex is located within the Binh Duong Provincial Master Plan for Solid Waste Treatment and Management.

2.1 INTRODUCTION TO BIWASE

BIWASE was formerly a government institution and converted to a private corporate entity in 2005. A brief history of BIWASE is provided below:

- Prior to 1975, BIWASE was originally known as Binh Duong Water Supply Center. Its name was changed to Public Work and Water Supply Enterprise, which was managed under the People's Committee of Thu Dau Mot town;
- On 15 October 1991, it was replaced by a state-owned enterprise of "Song Be Water Supply Sewerage Enterprise" which was established based on a decision signed by Song Be Provincial People's Committee (PPC) and had the main functions of treatment, supply and installation of distribution water pipes for consumers;
- On 1 January 1997, Song Be Province was divided into two new provinces, namely Binh Duong Province and Binh Phuoc Province. Song Be Water Supply Sewerage Enterprise was then officially changed to Binh Duong Water Supply Sewerage Company on 13 April 1997 and set up in the form of a state-owned enterprise under the direct management of Binh Duong PPC and supervised by the Department of Construction, from an economic and technical perspective; and
- On 21 December 2005, Binh Duong PPC decided to convert the state-owned enterprise, Binh Duong Water Supply Sewerage Company, to a private corporate entity named Binh Duong Water Supply Sewerage Environment Limited Company (BIWASE), as it is today.

Operating predominantly in Binh Duong Province, BIWASE's current business activities include:

- Water supply, which represents approximately 60% of its total revenue;
- Solid waste transportation and management, which represents approximately 20% of its total revenue;
- Collection and treatment of wastewater, which represents approximately 2% of its total revenue; and
- Other business activities which provide the balance of the revenue (18%).

The Waste Treatment Complex is one of the business units of BIWASE in Binh Duong Province.

Based on the list of approved activities in BIWASE's Certificate of Business Registration, none of them are listed on ADB's Prohibited Investment Activities List.

2.2 PROJECT SITE AND SURROUNDING LAND-USE

2.2.1 PROJECT SITE AND PROCESSES

The Waste Treatment Complex, which is owned by BIWASE was established in 2005. It is the sole unit in Binh Duong Province that the Binh Duong Provincial People's Committee (PPC) has contracted to collect and treat domestic waste, industrial waste, medical waste and hazardous waste.

In terms of waste collection / receival, the Waste Treatment Complex is tasked by the Binh Duong Provincial People's Committee (PPC) to collect and treat the province's waste including domestic waste, industrial waste, medical waste and hazardous waste. Based on information from BIWASE, the Site receives waste from facilities in all the districts and towns in Binh Duong Province under contract. The collection of domestic (residential) waste is agreed upon by communes/wards in the province with private collection cooperatives. Waste is collected and transported by the private collection cooperatives to a central collection point, where the trucks of the districts' Departments of Natural Resources transport the collected waste BIWASE's Waste Treatment Complex for processing and treatment. Waste vehicles deliver waste to the site which is charged at either contracted rates or on a gate fee basis. The Site is open to all waste vehicles provided the waste they are delivering meets the waste acceptance criteria for the various licensed processes and disposal options on site. Vehicles carrying waste are weighed at the Site entrance and again on exit via the weighbridge and weights are used to determine cost on a per tonne basis. Information retained by the Site in relation to each waste load includes weight, waste type, vehicle registration, waste carrier, and origin.

The Waste Treatment Complex receives about 240 trucks per day on average. Vehicles of BIWASE and third parties are covered by compulsory and voluntary insurance according to local regulations. BIWASE's waste transport drivers undergo periodic health checks every year for occupational related conditions, while third party drivers are covered by their respective employers. In terms of traffic management, BIWASE's waste collection and transportation vehicles utilise pre-planned routes specific to each area where collection takes place. Waste collection and transportation follows a fixed collection schedule between 0800 and 1630 hours which has been developed to minimise impact on traffic within the province.

The Waste Treatment Complex covers an area of approximately 100 ha and includes the following main components:

- Three hazardous waste incinerators (capacities of 1,700 kg/hour, 1,700 kg/hour and 4,200 kg/hour, respectively);
- Two non-hazardous industrial waste incinerators (capacities of 1,000 kg/hour and 4,200 kg/hour respectively);
- Two incinerators for medical waste and animal carcasses (capacities of 100 kg/hour and 200 kg/hour respectively);
- One incinerator for a mixture of municipal waste, non-hazardous industrial waste, and hazardous waste (capacity of 8,400 kg/hour). This incinerator is equipped with continuous stack air emission monitoring (which monitors nitrogen oxides (NOx), sulphur oxides (SOx), carbon monoxide (CO), carbon dioxide (CO_2), residual oxygen (O_2), temperature and dust with the results transmitted online to the provincial Department of Natural Resources and Environment (DONRE)) and power generation (under installation at the time of the Site visit);
- An industrial wastewater treatment plant (WWTP) (with a capacity of 250 m^3/day), treating wastewater to meet Class A[2] discharge standard;
- Three composting plants (with a total capacity of 1,680 tpd);
- A municipal waste sorting facility (two lines);
- A sludge drying plant;
- Secure (concrete lined) landfill cells for hazardous waste including hazardous ash;
- A 'Septic' warehouse for the storage of waste fly ash from the incinerator processes that has been treated using cement solidification;
- Other hazardous waste treatment facilities (washing, fluorescent light bulb grinding and solidification, solvent distillation recovery);
- Operational municipal waste landfill cell (known as "4B");
- Closed municipal waste landfill cells (known as 1a, 1b, 2, and 4);
- A leachate treatment plant (with a capacity of 960m^3/day), treating wastewater to meet Class A discharge standard;
- A brick making facility (utilising ash from the incineration of non-hazardous waste (tested for hazardous content based on *QCVN 07:2009/BTNMT)*, and non-hazardous water treatment sludge); and
- A mechanical workshop for the Site.

[2] Classification based on Vietnamese Effluent Code for Industrial Wastewater (QCVN 40:2011/BTNMT): the allowable effluent concentrations are conditioned by the function of the receiving water body; if the receiving water source is used for domestic water supply, the wastewater effluent should not have concentrations higher than Class A effluent standards. If the receiving water body is not used for domestic water supply purposes, the effluent standard should be at least at Class B effluent standards.

If approved to proceed, ADB will provide corporate financing to BIWASE to finance the construction and operation of the expansion facilities (i.e. one WtE of 8,400 kg/h or 201.6 tpd capacity and a new composting facility of 840 tpd capacity). The Site location map and Site layout plan are provided below in *Figure 2-1* and *Figure 2-2*, respectively, and the main areas of the Site and a summary of the various components are summarised in *Table 2-1* (and includes the Project components).

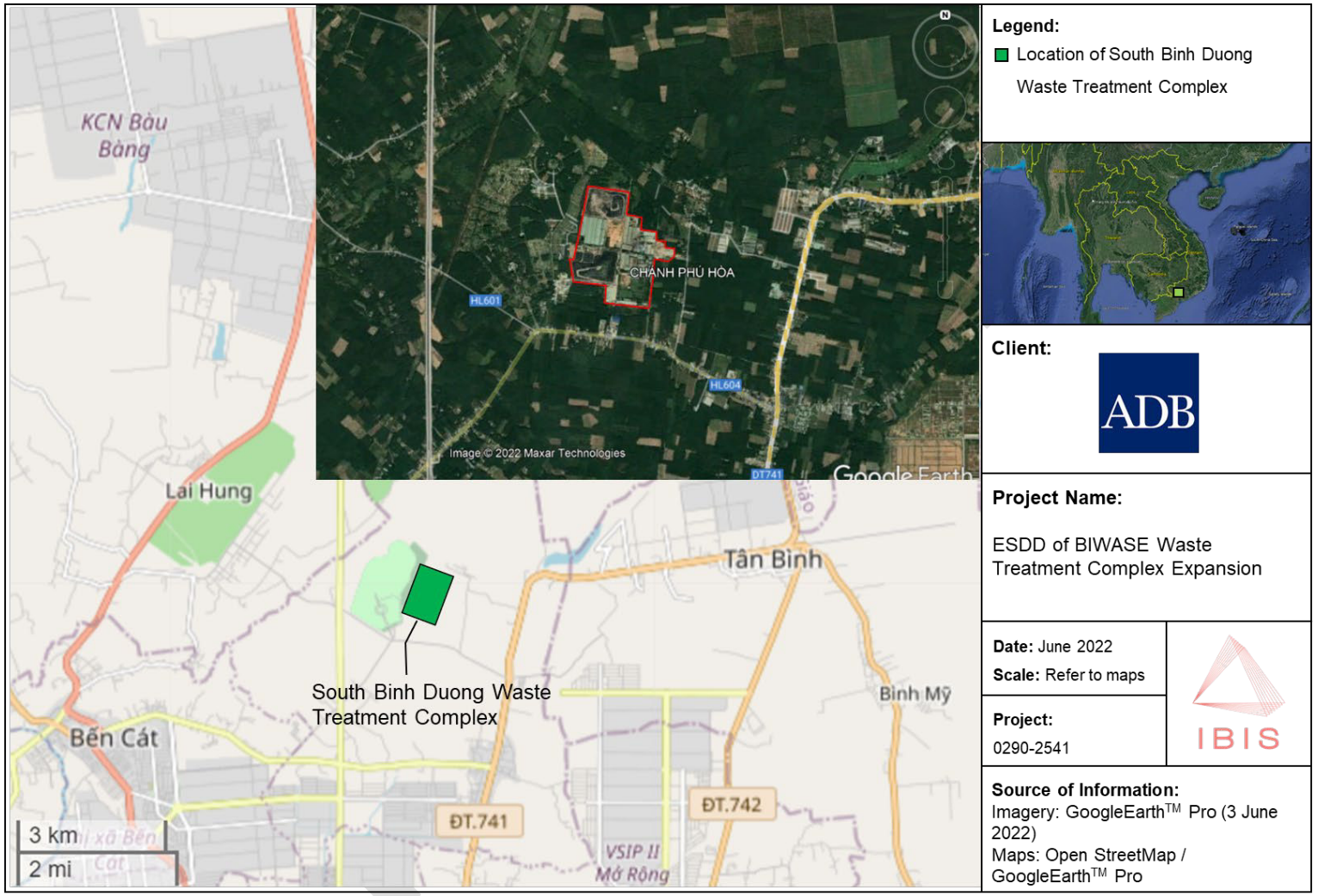
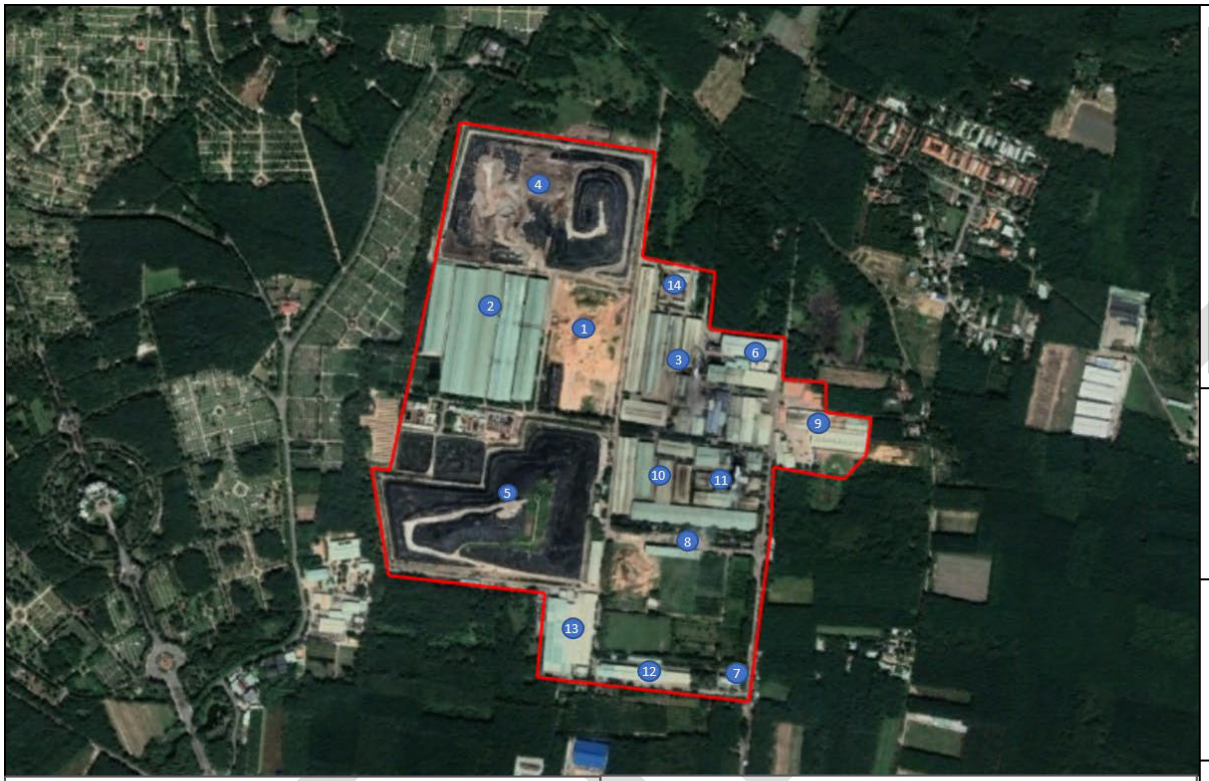
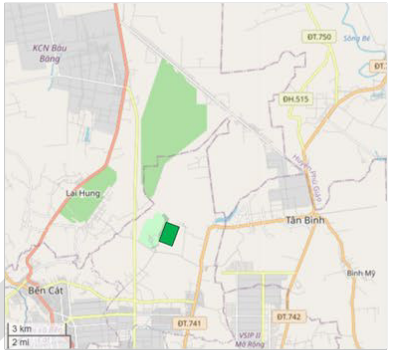


Figure 2-1 Site Location Map





1 - Compost plant 4 (under construction)
2 - Compost plant 3 (operational)
3: Compost plant 1 (operational)
4: Landfill (current cell in use)
5: Landfill (closed)
6: Waste to Energy (8.4kg/hour line)
7: Admin Building
8: Vehicle Wash
9: Brick kiln
10: Compost plant 2 (operational)
11: Other operating incinerators
12: Mechanic workshop
13: Cement brick plant
14: Industrial liquid waste treatment plant

Client: ADB

Project Name:
ESDD of BIWASE Waste Treatment Complex Expansion

Date: June 2022
Scale: Refer to maps

Project:
0290-2541

IBIS

Source of Information:
Imagery: GoogleEarth™ Pro (3 June 2022)
Maps: Open StreetMap / GoogleEarth™ Pro

Figure 2-2 Site Layout

Table 2-1 Waste Treatment Complex Components and Areas

NO.	COMPONENT	AREA (M^2)	PERCENTAGE OF SITE (%)	REMARKS
I	**Administration area**	**11,400**	**1.14%**	
1.1	Specialised vehicle garage	2,190		
1.2	Maintenance station	600		
1.3	Weighing station	135		
1.4	Laboratory	45		
1.5	Water treatment area	200		
1.6	Electrical substation, backup power generator	270		
1.7	Operation & administration facilities	480		
1.8	Reserved land[3]	7,480		
II	**Composting area**	**151,000**	**15.1%**	
2.1	Compost production line no. 1	26,500		
2.2	Compost production line no. 2	24,500		
2.3	Compost production line no. 3	56,500		
2.4	Compost production line no. 4	43,500		840 tpd plant being developed in place of the approved plant with capacity

[3] Not defined in the document provided, however, assumed to be undeveloped areas.

NO.	COMPONENT	AREA (M^2)	PERCENTAGE OF SITE (%)	REMARKS
				of 420 tpd
III	**Landfills and wastewater treatment area**	**329,800**	**3.98%**	
3.1	Available landfill and a centralised WWTP with capacity of 960 m^3/day	276,622		
3.2	Wastewater treatment area with a treatment capacity of 250 m^3/day	7,350		
3.3	Reserved land for the Waste Treatment Complex	45,828		
IV	**Industrial and medical waste treatment area**	**61,524**	**6.15%**	
4.1	Industrial waste storage area	21,176		
4.2	Medical waste storage area	100		

NO.	COMPONENT	AREA (M^2)	PERCENTAGE OF SITE (%)	REMARKS
4.3	Incinerators and flue gas treatment area (two incinerators with a processing capacity of 1,700kg/hour each, one incinerator of 100 kg/hour, one incinerator of 200 kg/hour, and one incinerator of 1000 kg/hour)	5,300		
4.4	Area with two incinerators of 4,200 kg/hour processing capacity each and a flue gas treatment system	6,200		
4.5	Safe landfill for hazardous waste	2,208		
4.6	Area with two incinerators of 8,400 kg/hour processing capacity each and three power generators (with total generating capacity of 13,800 kWh)	5,115.20		
4.7	Area for construction waste crushing	1,008		
4.8	Area for sludge dryer (previously a kiln of 20,000 brick/day)	2,286		

NO.	COMPONENT	AREA (M^2)	PERCENTAGE OF SITE (%)	REMARKS
4.9	Area reserved for industrial solid waste treatment	18,131		
V	**Area for industrial solid waste treatment and recycling**	**80,200**	**8.02%**	
5.1	Area with existing facilities for industrial solid waste treatment and recycling (industrial wastewater treatment area and waste recycling systems)	19,100		
5.2	Area for brick production lines	4,888.80		
5.3	Area reserved for industrial solid waste treatment and recycling	56,211.20		
VI	**Area for construction waste recycling**	**48,200**	**4.82%**	
6.1	Concrete mixing station	1,300		
6.2	Brick production workshop	12,200		
6.3	Warehouse for process residues and other recycled products	5,100		
6.4	Area reserved for construction waste recycling	29,600		
VII	**Hi-tech treatment area**	**45,300**	**4.53%**	

NO.	COMPONENT	AREA (M^2)	PERCENTAGE OF SITE (%)	REMARKS
	Vacant land	45,300		
VIII	**Internal roads**	**52,676**	**5.27%**	
	Constructed	54,176		
	Reserved area	7,500		
IX	**Green separation corridor**	**219,900**	**21.99%**	
	Total	**1,000,000**	**100%**	

According to the domestic Environmental Impact Assessment[4] (EIA) report updated in 2022 (2022 EIA), on a daily basis, the Site receives and treats the following types of waste, on average: 2,990 tons of domestic solid waste, 1,384.4 tons of industrial solid waste, 1,682.4 tons of hazardous waste, and 160 tons of construction waste, which are the amounts of waste approved to be treated by the Site in the domestic EIA report 2019 enclosed with Decision No. *2770/QD-BTNMT* dated 30 October 2019. This adds up to a total capacity of 6,216.8 tpd.

By 2025, the amount of municipal waste in the whole province is expected to increase to 3,060 tpd with a collection rate of 90%. In addition, industrial development in the region is expected to increase hazardous waste to 1,953 tpd and non-hazardous industrial waste to 40,629 tpd by 2025. The key objective of the expansion to support the management of the increased volumes of industrial and domestic waste expected to be generated in Binh Duong Province. The receiving and treatment capacity of the Site by 2025 is projected to be 3,511.6 tpd for municipal domestic solid waste (increasing by 521.6 tpd compared to 2019); 1,204.7 tpd of non-hazardous industrial solid waste (decreasing by 179.7 tpd compared to 2019) and 1,732.08 tpd of hazardous waste (increasing by 49.68 tpd compared to 2019). The treatment capacity for construction waste will remain the same as 2019 at 160 tpd. The total capacity of the Site will increase by 391.58 tpd compared to 2019, to a total of 6,608.38 tpd.

The process of waste reception and treatment at the Site is depicted in *Figure 2-3* and described below. All types of domestic and industrial solid waste in the Binh Duong area will be collected and treated at the Site. The Site is equipped with other relevant infrastructure including internal roads, water supply and sewerage system, fire prevention and fighting system, back-up power supply and internal telecommunications. BIWASE will enhance the infrastructure to accommodate additional aspects including:

- **Domestic waste receival and treatment**: the current technology for domestic waste treatment includes waste segregation for compost production, recycling, combustion and landfill of any residues. The new treatment and recycling components should increase the waste recycling rate and minimise the landfill of residual materials, thereby extending the life of the existing landfill;
- **Industrial and hazardous waste receival and treatment**: BIWASE was granted the Hazardous Waste Treatment Permit (Ref.: QLCTNH) no. 1-2-3-4-5-6.028.VX dated May 23, 2019 with Appendix II revised on July 23, 2020 by Ministry of Natural Resources and Environment; and
- **Medical waste receival and treatment**: medical waste is transported by BIWASE using specialised vehicles to transport it to the Site for disposal in the medical waste incinerators (with

[4] Environmental Impact Assessment Report (file name: *VIE BDMSW_ updated EIA (2022) to include the composting plant_ENG*); received 20 May 2022. Note that the 2022 EIA covers changes to other parts of the Site, including the expansion to be funded by ADB.

processing capacities of 100 kg/hour and 200 kg/hour as per approved EIA, and one medical waste incinerator with a capacity of 1,000 kg/hour which was converted from the combustion of non-hazardous industrial waste) before cement solidification of the fly ash and disposal in either the septic house used for long term storage or in the hazardous waste landfill.

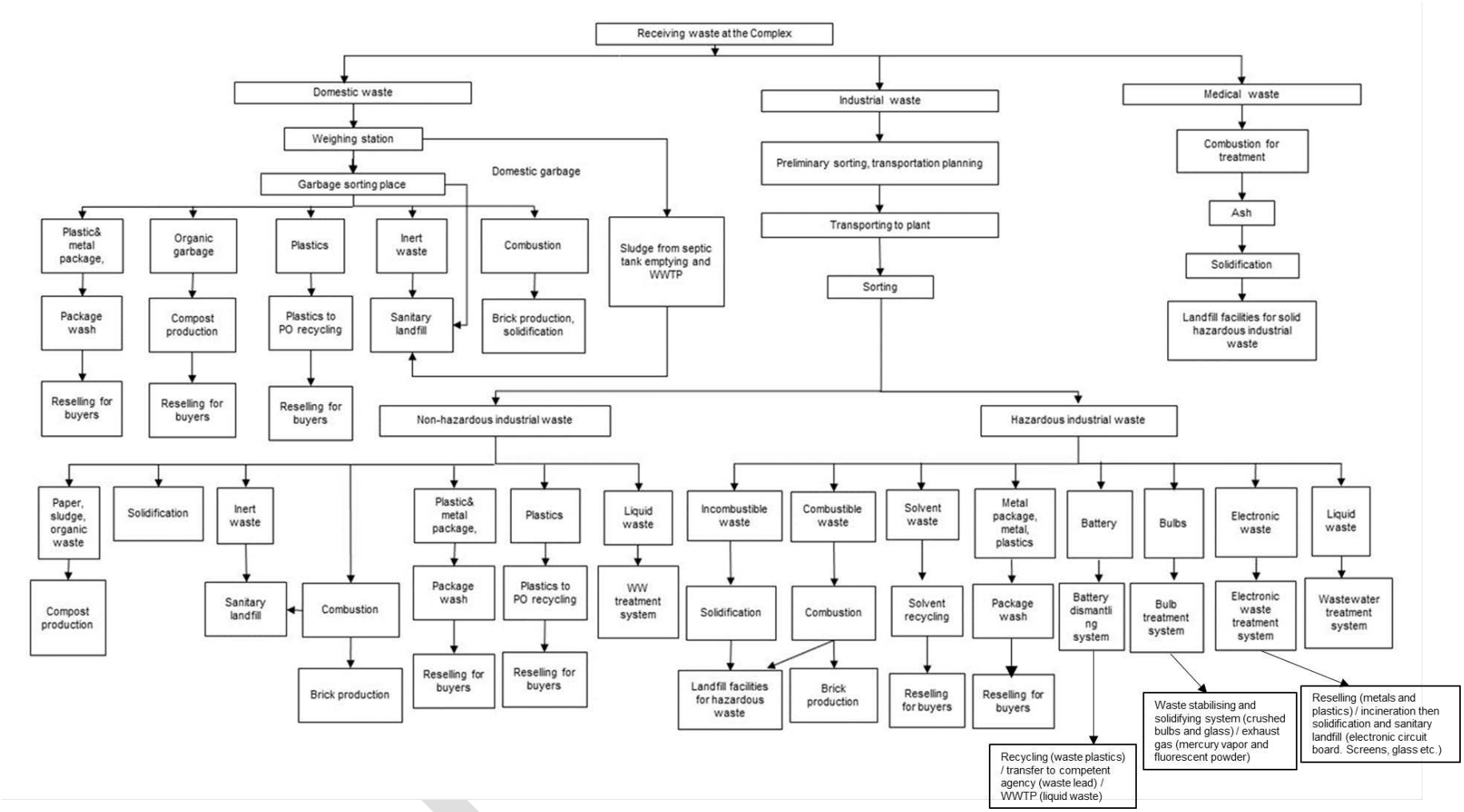


Figure 2-3 Process of Waste Reception and Treatment in the Waste Treatment Complex (Source: 2022 EIA)

Wastewater

Wastewater from the entire Site drains to a centralised wastewater treatment area with a centralised WWTP of capacity of 960 m^3/day (towards the west of the Site) and a WWTP with capacity of 250 m^3/day (towards the north of the Site), with a total capacity of 1,210 m3/day. The new components of the Waste Treatment Complex will utilise the existing WWTPs on-site. A schematic of the wastewater treatment system is shown in *Figure 2-4*. Based on the 2022 EIA, all the wastewater discharged from the ongoing operational activities (approximately 1,042 m^3/day) are directed to the two existing WWTPs on the Site (the total amount of wastewater to be generated on the Site after the changes on site covered in the EIA, including the expansion to be funded by ADB, is expected to be 1,198 m^3/day); this includes leachate generated through the processes on the Site. Neither the new composting plant nor the WtE to be funded by ADB generate significant amounts of wastewater discharge which would affect the overall water balance of the Site.

Domestic Wastewater

Domestic wastewater from septic tanks is sent to the Site's centralised WWTP of 960 m^3/day for treatment complying with regulatory quality requirements before release to the Ben Tuong stream via an unnamed stream. The Ben Tuong stream drains into the Thi Tinh River (a tributary of Saigon River) which is around 10km southwest of the Site. Based on the 2022 EIA, the Thi Tinh River is the final receiving place of wastewater from the Site.

Wastewater from the New Composting Plant with a Capacity of 840 tpd

Leachate from waste reception pits flows into wastewater collection pits, each of which is 2 m in diameter and 3 m in depth. Leachate, which is estimated to be around 33.6 m^3/day, is pumped directly to the wastewater storage pond in the centralised WWTP, using three automated pumps, each with a capacity of 25m^3/hour each and PVC pipeline with diameter of 100 mm which is connected to the 400mm collection pipeline leading to the wastewater storge pond.

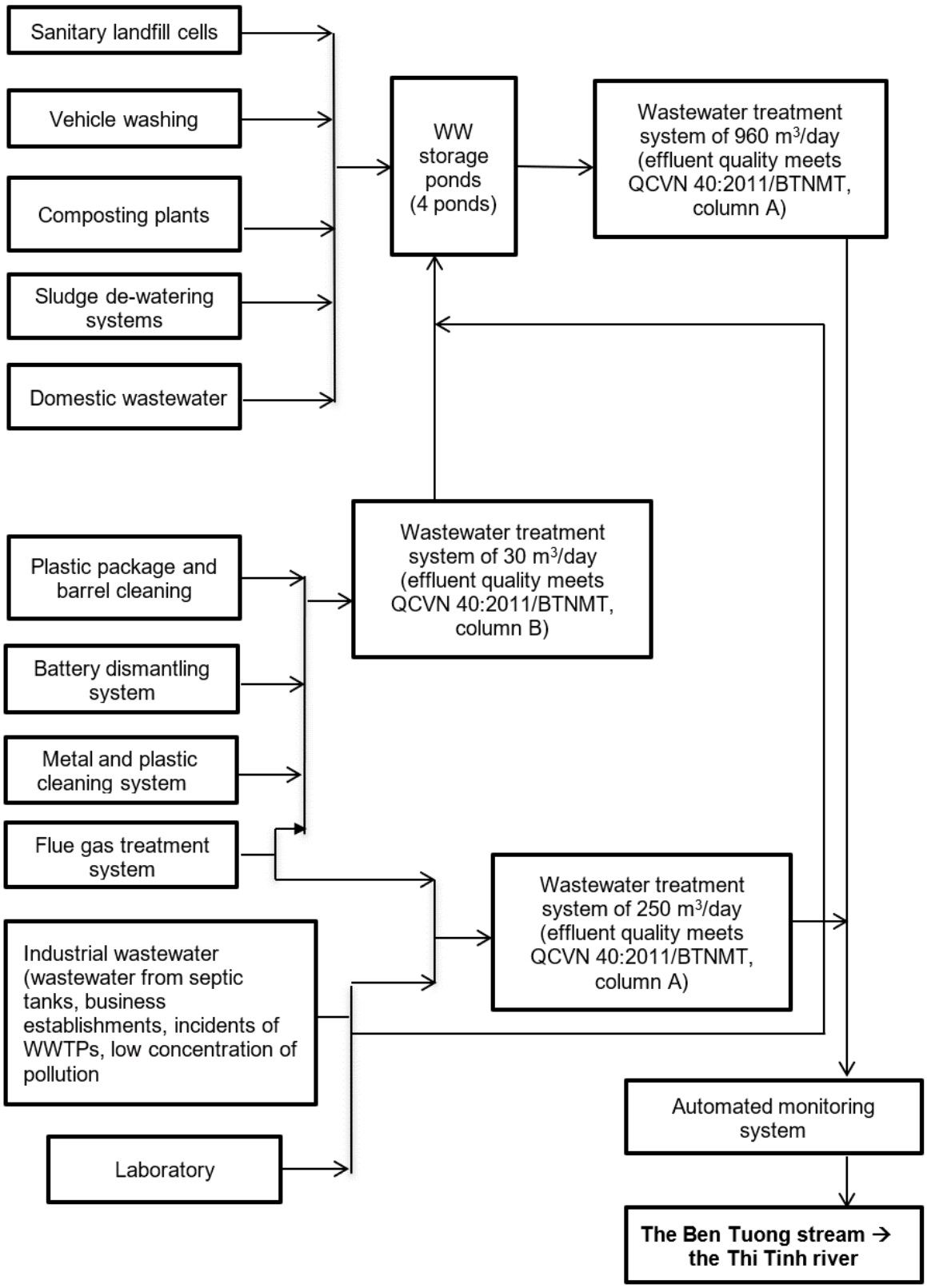


Figure 2-4 Schematic of the Wastewater Treatment at the Site (Source: 2022 EIA)

Transportation Infrastructure

Waste is brought to site by a combination of BIWASE's own fleet and third-party vehicles. The Site serves the entire province. There is only one route to and from the Site along the main two way highway HL 604 which connects to the dual carriageway DT741 to the east and the My Phuoc Tan Van motorway to the west. The route to and from the Site does not pass through any significant residential areas nor does it use any minor roads.

The total length of concrete roads in the Site is 3,207.7 m; the total length of the unmade roadways is approximately 3,458 m. The majority of the Site operates a two-way road system. Based on observations during the Site visit, trucks delivering waste are of various specifications including enclosed rear end loading refuse collection vehicles and roll on / off vehicles; capacities range up to gross vehicles weights of 44 tonnes. Some vehicles entering the site are uncovered however according to Site personnel these are third party vehicles and not part of BIWASE's own fleet.

Isolation Corridor and Buffer Zone

Based on the 2022 EIA, there is a 20 m buffer zone (*Figure 2-5)* planted with trees around the perimeter fence of the Site. In addition, ornamental plants are grown in front of the office building. The national technical regulation QCXDVN 01:2021/BXD only provides the required distance for each type of waste treatment facilities and does not have a provision in case of a waste complex. In the 2022 EIA, BIWASE calculated the distances from the respective facilities on site to the closest residential areas (including distance from the respective facilities to the site perimeter); based on the analysis, there is alignment with the required isolation distances for the respective facilities on the Site as per national technical regulation QCXDVN 01:2021/BXD.

The total green area within the Site is reportedly 21.99 ha, equivalent to 21.99% of the total land area, complying with the national technical regulations on technical infrastructure works – solid waste management works and public toilets QCVN 07-9:2016/BXD.

Figure 2-5 Buffer Zone Around the Waste Treatment Complex

Expansion Works

The Project lies within the existing physical footprint of the Site, with an area of about 5 ha and does not require additional direct land acquisition. The key components of the Project are as follows:

- WtE facility (8,400 kg/hour or 201.6 tpd); and
- Composting plant (840 tpd).

The layout of the Project is illustrated in *Figure 2-2*. The composting plant, which has a footprint of 43,531.8 m^2 is being constructed in the centre of the Site, bounded on all four sides by existing waste infrastructure including the current landfill area to the north, the closed landfill area to the south, composting line 3 to the west and composting lines 1 & 2 to the east. The WtE plant is located in the eastern portion of the site, beyond the buildings for compost lines 1 & 2. There are no Associated Facilities which the Project relies on without which it would not be able to operate, such as transmission lines or access roads.

The existing landfill site appeared to be designed to Good International Industry Practice (GIIP). It is engineered using a HDPE liner layer on the cell floor as well as for capping the cell. The landfill site appeared in to be well run with the application of daily cover to the waste mass to prevent odour and wind-blown litter. Leachate management is via a dedicated system with two modules and a total

capacity of 960 m^3/d serving all five cells (three inactive and two active) across the site (see description of wastewater treatment). Landfill gas is collected from the inactive cells and used for power generation.

The Project was approved in accordance with the Policy No. 449/UBND-KT dated 26 January 2022, and the key features of the overall expansion works are summarised in *Table 2-1* above based on the 2022 EIA. The 2022 EIA has received governmental approval (Decision No. 1232/QD-BTNMT) in June 2022.

2.2.2 SURROUNDING LAND USE

According to a review of Google Earth historical aerial imagery, and information collected during the Site visit, and information provided by BIWASE, land uses in the immediate vicinity of the BIWASE Waste Treatment Complex (see *Figure 2-6* and *Figure 2-7*) mainly include:

- North: Rubber plantations and Chanh Phu Hoa Social Protection Center is located approximately 500m to the northeast;
- East: Rubber plantation and some residential houses approximately 200m from the Site;
- West: Binh Duong Cemetery Park (the Company reportedly has a 51% share in this facility); and
- South: Rubber plantation, commercial and residential premises along the main road approximately 300m from the Site.

Most of the residential premises surrounding the Site were previous landowners who were compensated for their land when the Site was developed. They have since set up businesses which are supported by the Project (e.g. truck stops, cafes for drivers etc). The Site was developed in 2004, prior to which the land appears to have been a rubber plantation (*Figure 2-8*). A summary of the known Site history is provided in

Table 2-2 below.

Figure 2-6 Aerial Imagery of BIWASE Waste Treatment Complex and its surrounding area as of January 2022

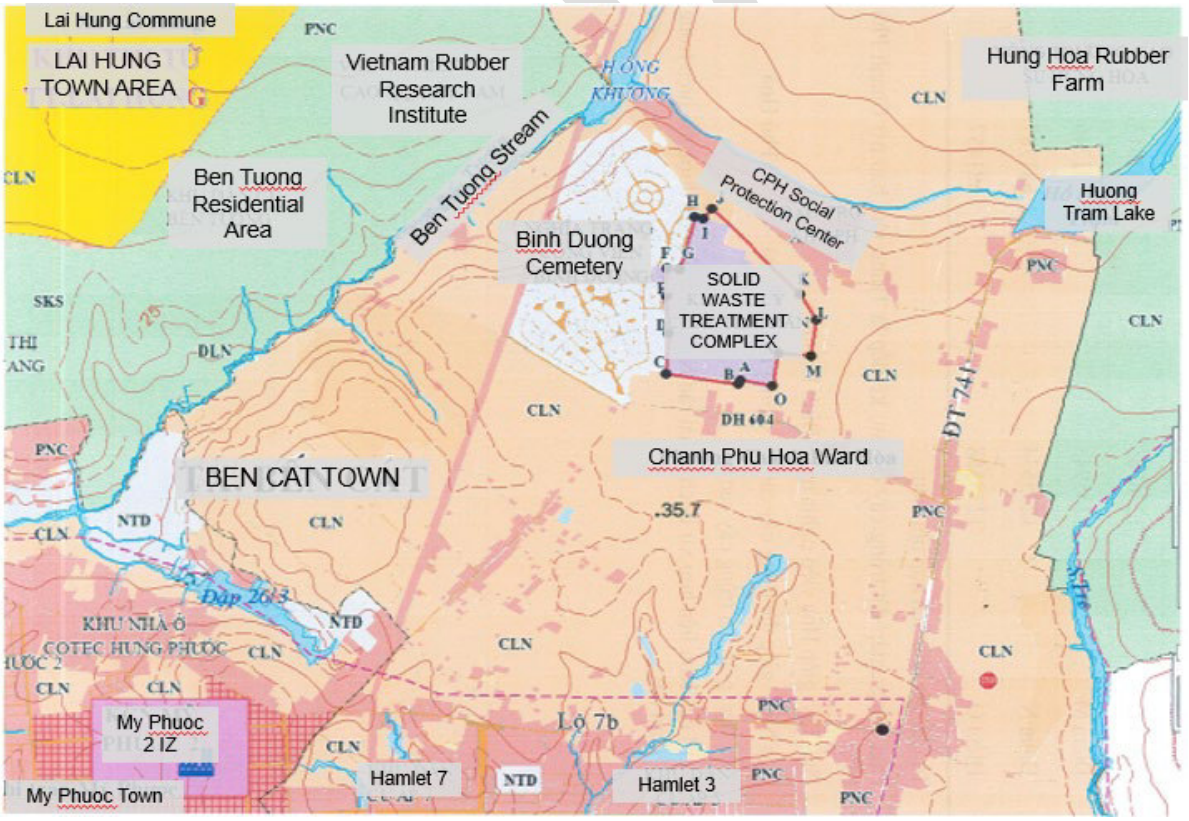


Figure 2-7 BIWASE Waste Treatment Complex and Surrounding Land Uses (Source: 2022 EIA)

Figure 2-8 BIWASE Waste Treatment Complex and Surrounding Land Uses 2003 (Source: Google Earth)

Table 2-2 Site History

YEAR	DESCRIPTION
2003	Appears to have been agricultural land with little to no development in the surrounding area. The settlement to the northeast of the Site is already established.
2004	Development of the Site by the Company commences.
2010	Based on the available aerial imagery, a landfill area of about 33 ha had been developed, including multiple landfill cells. Various buildings had been added in the northeast portion of the Site apparently for waste incineration.
2017	In 2017 the Site was expanded to the north taking the total footprint to around 52 ha. The most northerly part appears to have developed into another landfill cell. Additional buildings were constructed in the northeast portion of the site apparently for waste incineration, composting, wastewater treatment, etc.
2019	The Site was further extended to the west, including an extension to the northerly most landfill cell as well as the addition of a new set of buildings for the purpose of composting (compost factory 3). The total area of the site in 2019 is estimated at approximately 100 ha.
2021	The current Site is as shown in *Figure 2-6* and includes the landfill areas, composting facilities, leachate treatment plant, brick manufacturing plant, industrial wastewater treatment plant, incinerators, and other hazardous waste treatment processes.

Streams and Rivers

According to the FSR, Binh Duong Province is sandwiched between Saigon River and Dong Nai River (Saigon-Dong Nai river system), two large rivers in the Southeast region of Viet Nam. These two rivers are the main source of water supply for domestic and economic activities not only for Binh Duong but also for neighbouring provinces, especially Ho Chi Minh City which is located downstream. Future activities of the project are likely to have an impact on the water environment of one of these two rivers.

A stream named Ben Tuong runs at approximately 1.2km northwest of the site (at the nearest point). The Ben Tuong stream receives treated wastewater discharge (from both the treatment of the leachate and industrial wastewater) from the Site, via a small unnamed stream. Ben Tuong Stream runs mostly through rubber plantations and some residential areas before draining into Thi Tinh River, around 10km southwest of the site. Based on the 2022 EIA, the Thi Tinh River (a tributary of Saigon River) is the final receiving place of wastewater from the Site (see *Figure 2-9*). Currently, the downstream portion of the Thi Tinh River mainly provides irrigation water for agricultural production households and is not known to serve the function of supplying domestic water. The Thi Tinh River water is also used for industrial production purposes, specifically some paper production companies such as Chanh Duong Paper Factory, An Hung Tuong Steel Co., Ltd. and a number of other companies licensed to exploit water and use surface water from the Thi Tinh River and canals for their production process. Surface water is not allowed to supply water for domestic activities. The total amount of surface water exploited in the Thi Tinh River is 11,000 m^3/day.

The Thi Tinh River is currently the recipient of wastewater from industrial zones/industrial clusters and factories in the Thi Tinh River basin. The major waste sources are My Phuoc 1, 2, 3 industrial zones, Bau Bang industrial zones, the companies operating in the fields of animal husbandry, rubber processing, and paper production. In addition, the Thi Tinh River also receives domestic wastewater from the Ben Cat urban area.

The Saigon River is known to be seriously polluted with organic substance and micro-organisms, even heavy metal pollution in some areas. Based on an analysis[5] of available data / information up to 2005 from local government agencies / universities / non-governmental organisations (NGOs) / documents of the World Bank and international partners, the water quality in the middle parts of the Saigon-Dong Nai river system including the Thi Tinh River mouth is locally polluted by organic substances, and monitoring results show that dissolved oxygen is low and nitrogen in the form of ammonium ($N\text{-}NH_4$) is

[5] Vietnam Environment Monitor 2006 - Water Quality in Viet Nam with a Focus on the Cau, Nhue-Day and Dong Nai River Basins. Ministry of Environment and Natural Resources (MONRE), the World Bank, and Danish International Development Agency (DANIDA), 2006.
https://documents1.worldbank.org/curated/en/637281468308963359/pdf/404180VN0Env0M19190001PUBLIC1optmzd.pdf

above the Surface Water Quality Standard TCVN 5942-1995 (TCVN (A) is applicable for surface water used for domestic water supply, assuming appropriate treatment). At the Thi Tinh River mouth, $N\text{-}NH_4$ levels are over 30 times the allowable limit under TCVN (A).

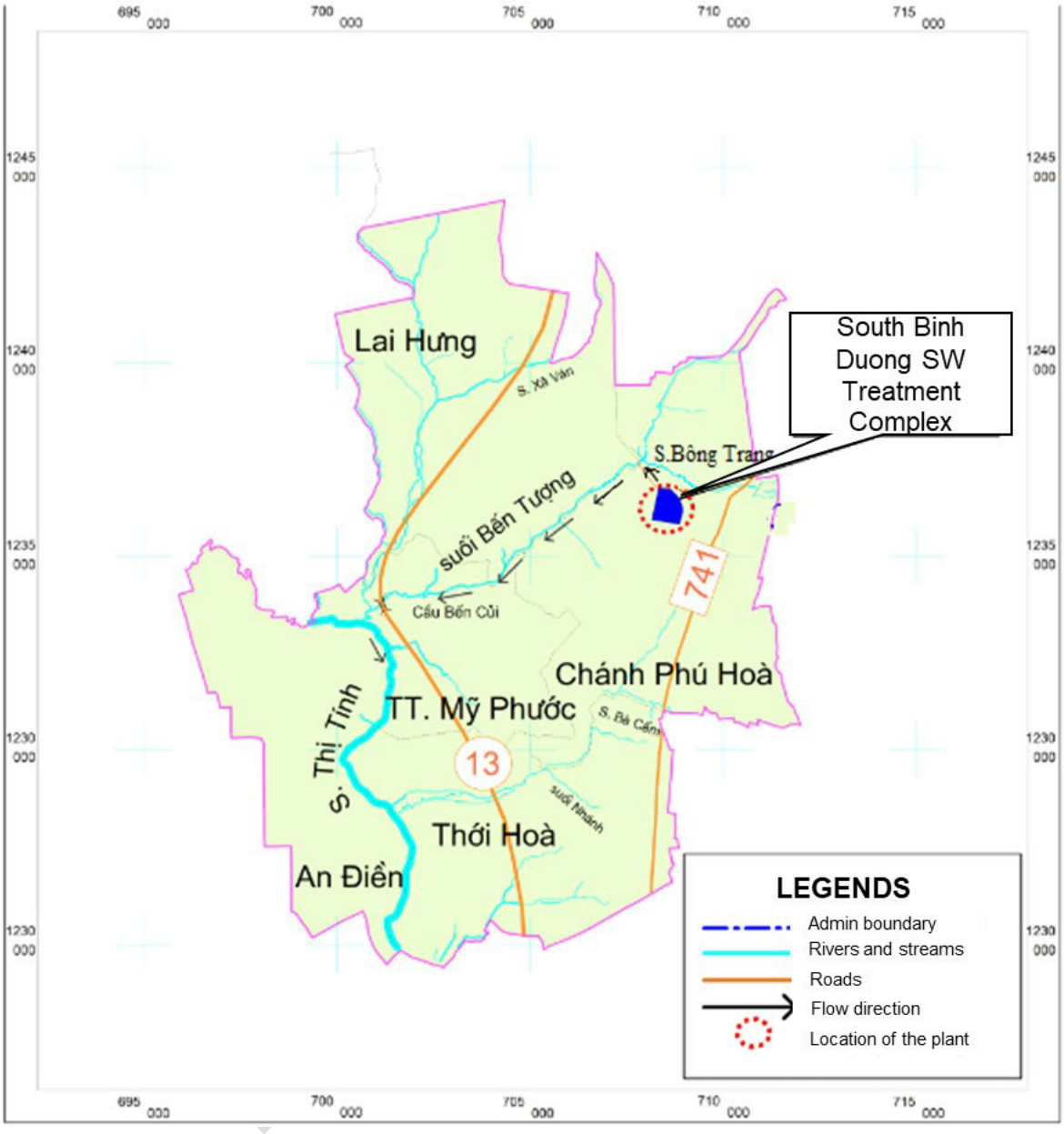


Figure 2-9 Wastewater Discharge of the Site (Source: 2022 EIA)

2.2.3 COMPOSTING PLANT

With an area of 151,000 m^2, the composting area is located in the central, western and north-western parts of the Site. The Site currently operates three composting plants with the total capacity of 1,680 tpd (two of 420 tpd and the other one of 840 tpd). The approved compost production capacity is 2,100 tpd, including an additional production unit of 420 tpd that was approved in 2014, however, its operation has yet to commence. As such, a new composting plant with a capacity of 840 tpd is under construction

(see Photo 30 to Photo 33), an increase in the design capacity to address the increasing demand for waste treatment capacity in the region. The 840 tpd plant is being constructed in place of the previously approved plant with capacity of 420 tpd and therefore required an amendment to the EIA and permit. The 2022 EIA has been approved and now brings the total capacity of the four composting plants to 2,520 tpd. Outputs from the composting plants include powder and pellet fertilizers:

- Organic soil improvers;
- Organic fertilisers;
- Mineral organic fertiliser;
- Organic mineral fertiliser;
- Microbial organic fertiliser; and
- Bio-organic fertiliser.

The process of the composting plant is described in the FSR. Domestic solid waste treated in the composting plant goes through various steps: classification, decomposition, maturation, compost humus refinement, and compost packaging, which are described below and shown in the flow charts in *Figure 2-10*.

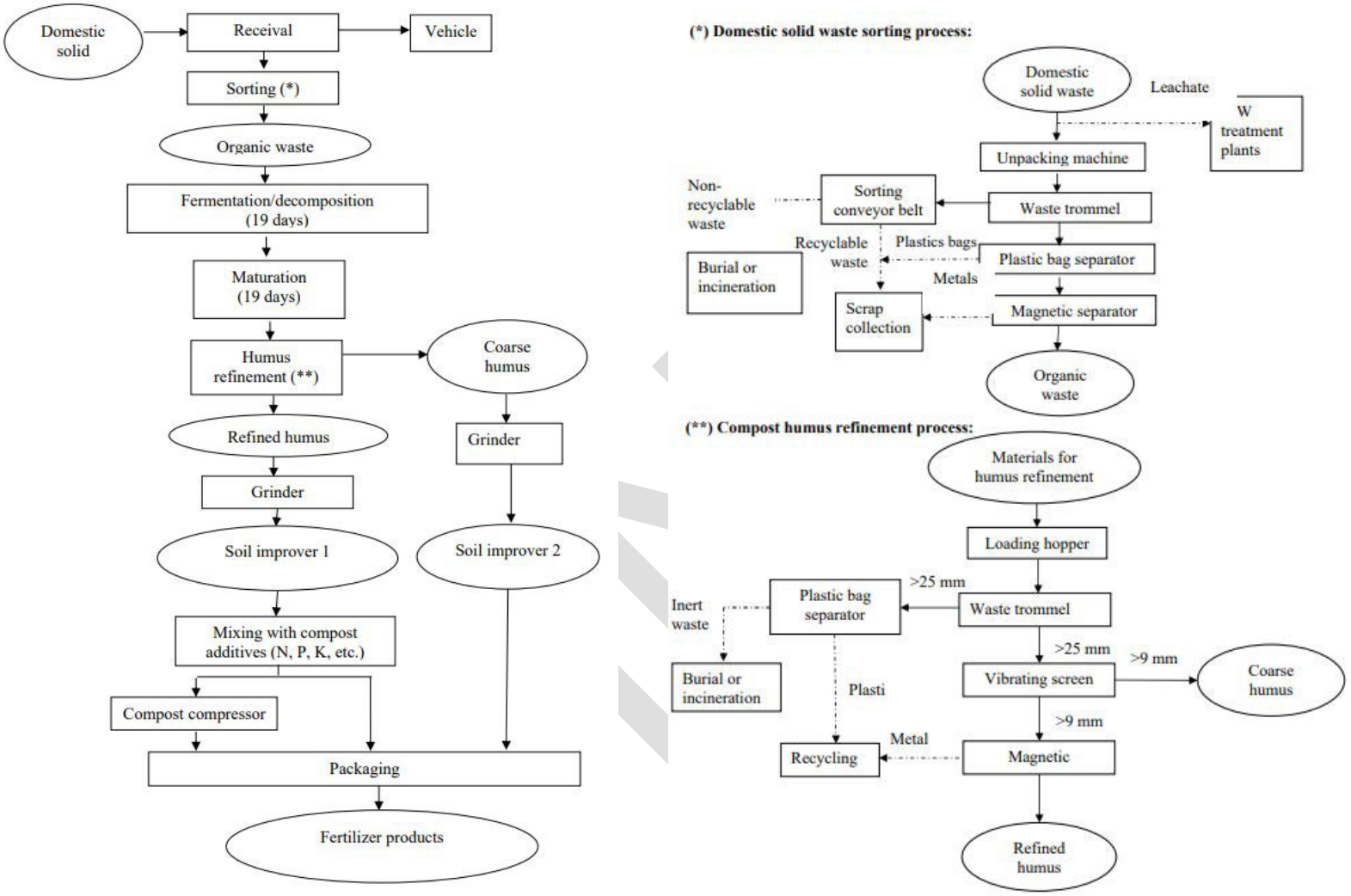


Figure 2-10 Flowchart for Composting Process (Source: FSR)

IBIS observed the waste reception line of compost line 3 in operation during the Site visit. Compost line 4 will reportedly use an identical process which is described below:

- Pre-receival (transportation): domestic solid waste is transported to the treatment plant using specialized vehicles. After being weighed (for both the vehicles themselves and the volume of waste carried) in the weighing station, the vehicles will transport the waste to the composting plant.
- Receival: after unloading the waste (which will be subsequently sorted – see description below), the empty vehicles will move to the washing station. After the washing, the vehicles will be weighed again, and drivers will pick solid waste receipt slips before leaving the Waste Treatment Complex.
- Classification:
    - Mixed municipal waste is received at reception bunkers at the start of the process. It is transferred to the waste conveyor by a crane grab and then fed through a bag splitter;
    - After the bag splitter, the domestic solid waste is chopped into small pieces and put on the conveyor belt to the trommel screen with a hole size of 9cm diameter. Waste content smaller than 9 cm in size passes through the sieve and is transported by conveyor belt to the nylon separator. After going through the magnetic separation equipment, the remaining waste content, which is mostly organic and decomposable, is transported to the Fermentation/Decomposition House via a conveyor belt; and
    - Waste content larger than 9 cm in size, which cannot pass through the sieve, is loaded onto the conveyor belt for manual sorting by workers to separate recyclable waste, nylon, plastic, etc. The recyclable waste (e.g. nylon, plastic, metal, etc.) collected after the sorting process is then transported by excavators and dump trucks to storage areas and used as recycled materials. The remaining waste is transported to the domestic solid waste decomposition tank or the incinerator using dump trucks. Based on data provided by BIWASE for the domestic waste handling processes at the Waste Treatment Complex, approximately 43.2% of waste received / sorted is organic waste, 6% leachate, 1.3% recyclables (plastics account for about 2.84% of the total volume of recyclables), and 49.5% waste sent for incineration or landfilling.
- Fermentation / decomposition
    - The composition of biodegradable organic waste is supplemented with suitable microorganisms, nutrients, and moisture to provide optimal conditions for the decomposition process. The mixture of organic materials is loaded into incubation tanks using excavators. When fully loaded, the incubation tanks are closed with a wooden door and a thermometer is installed to monitor the temperature inside the incubation tanks;

- Air supply to the incubation tanks is controlled automatically and the fan system is operated according to the time and incubation temperature in each stage of the decomposition process. Air is added to the bottom of the waste mix; and
- The fermentation/decomposition process produces some odour and gases which are collected for treatment by the gas collection system. After 19 days of fermentation/decomposition, compost is transported to the maturation house, using dump trucks.

- Maturation
  - Compost is stored in indoor windrows and then mixed using excavators; and
  - After 19 days of maturation, the windrows are ready for the next step of refinement.
- Compost humus refinement
  - Following the maturation phase, compost humus is taken to the loading hopper of the refinement process using excavators. From the feeding hopper, compost humus is transferred to a trommel screen with a hole size of 2.5 cm diameter using a conveyor belt system. The impurities and fibres that have not been decomposed in the fermentation/decomposition process, which are too large to pass through the sieve of the rotating barrel, are removed and directed to the incinerator. Compost humus smaller than 2.5 cm in size passes through the sieve and is transferred to the vibrating screen with hole size of 9 mm for classification into two types: (a) humus larger than 9 mm in size (coarse humus) which cannot pass the sieve will be used as soil improver or materials for the next stage of refinement (b) Humus smaller than 9 mm in size (refined humus) passes the sieve and is transported to the magnetic separator using the conveyor belt.
- Final compost product packaging:
  - Refined humus is transported to the mixing equipment using a conveyor belt. Here it is mixed with other additives then packaged as a final product; and
  - Fertilisers made from solid waste go through a quality check (including organic matter, density of beneficial microbes, number of infective propagules of mycorrhiza, moisture and pH) to check compliance with quality requirements issued by the Ministry of Agriculture and Rural Development. The final product is packaged and stored on-site before distribution.

According to BIWASE, each compost line is staffed with 54 full-time employees, including a manual waste picking line of around 20 people. Once constructed, compost line 4 will have a daily throughput of 840 tpd of mixed municipal waste and the total composting capacity of the plant across all four composting lines will increase to 2,520 tpd. Out of the total amount of 2,520 tpd of solid waste segregated for the composting process, solid waste taken for the composting process accounts for 60% of the initial amount of domestic solid waste (i.e. 1,512 tpd) while the other 40% is inert waste (i.e. 1,008 tpd) which will be returned to the recycling area or buried in sanitary landfills or combusted in the waste

incinerators. The ratio of input to the composting line to finished product is about 1:5 with any rejects from the compost (plastics, etc) redirected to the WtE as feedstock.

2.2.4 WTE FACILITY

Ten incinerators with a total processing capacity of 31,900 kg/hour have been approved for the BIWASE Waste Treatment Complex; as per the 2022 EIA, there are eight incinerators licensed for the Site (including one incinerator of 100 kg/hour and one incinerator of 200 kg/hour for medical waste, two incinerators of 1,700 kg/hour for hazardous waste, one incinerator of 1,000 kg/hour and two incinerators of 4,200 kg/hour for non-hazardous industrial solid waste and hazardous waste, and one incinerator of 8,400 kg/hour for domestic solid waste, ordinary industrial solid waste and hazardous waste). As part of the Project, the Waste Treatment Complex is in the process of completing the construction of its 8,400 kg/hour incinerator which it will use to treat and dispose of mixed municipal waste. The incinerator line is operational and has been operating for at least six months. The remainder of the construction is to complete the addition of a heat exchanger and a turbine (manufactured by Siemens) for the purpose of energy recovery and is scheduled for completion by December 2022. This incinerator which will be subject to the ADB financing does not replace any other existing incinerators at the Waste Treatment Complex.

The mixed solid waste incinerator is designed using moving grate WtE technology, with a design capacity of 8,400 kg/hour and a power generation capacity of 5 MW/h (the nett power generation by the incinerator is 4 MW/h as 1MW of Vietnam Electricity's (EVN) generated electricity is used to operate the WtE system). The generated electricity would be used internally at the Waste Treatment Complex net of the parasitic load required for its operation. The WtE plant is a bespoke design by BIWASE. It will operate 24 hours a day, with a daily operating capacity of 201.6 tpd. Feedstock for the incinerator is waste which has passed through the sorting / materials recovery process and is deemed unsuitable for composting / recycling. Ash/slag generated from the combustion process is collected in a hopper and transferred via trucks to the brick kiln. The combustion temperature is monitored in the control room and the input waste is monitored through the weighing station. During the site visit, there was no opportunity to safely observe the ash/slag to review the efficiency of the combustion process (e.g., unburnt waste).

The team expected to be involved in the operation of the incinerator include the following:

- Technical team (comprising two environmental engineers and one electrical engineer/electrician);
- One safety officer;
- Shift leaders (three environmental engineers); and
- 18 technical workers (three forklift operators, six crane operators, and nine unskilled workers).

IBIS understands that the technical team oversees all incinerators including the one proposed to be funded by ADB, while the safety staff oversees the entire Waste Treatment Complex.

According to BIWASE, it plans to recruit staff to operate the boilers and turbines for power generation:

- Boilers: four people with expertise in mechanics, electricity, technology, boilers, including one General Manager, one SCADA system manager and two boiler feed water system managers / water sample analysis; and
- Turbine: three people including one General Manager, one SCADA system manager and one ancillary system manager.

Each shift will also have two electricians with experience in operating and maintaining the plant's electrical system.

The flow chart depicting the operation of the WtE facility is shown in *Figure 2-11*. The key components of the incinerator include a primary combustion chamber, secondary combustion chamber and gas storage tower and a gas treatment system.

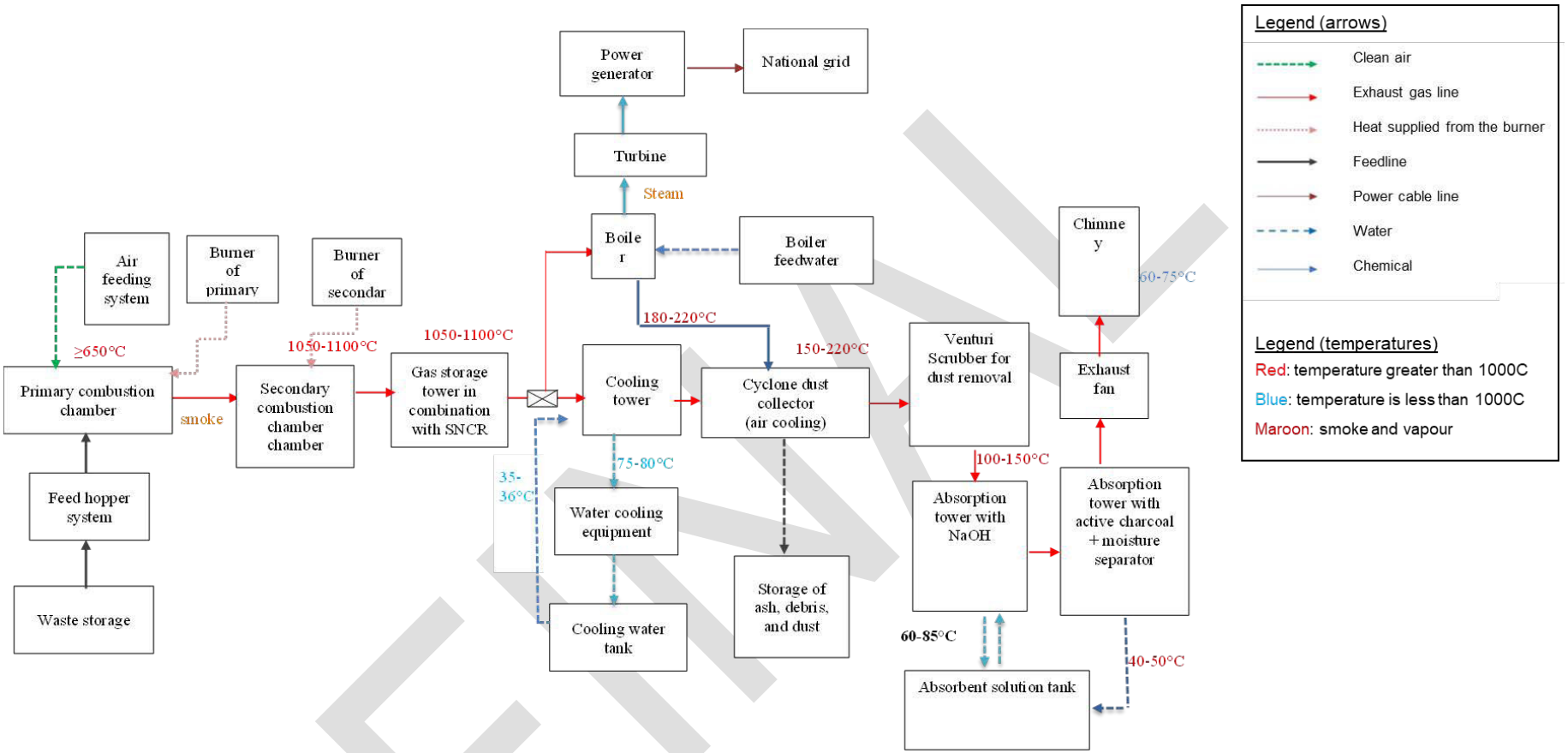


Figure 2-11 Flowchart Depicting the Operation of WtE Facility (Source: FSR)

The treatment of waste in the WtE facility is described below, based on the FSR.

Treatment Technology

The process of treating waste at high temperature is called “thermal treatment”, given the chemical reactions taking place with a high temperature and carbon, hydrogen and other elements present in the waste combine with oxygen in the air to result in complete oxidation and heat generation. Incineration of waste materials converts the waste into ash, flue gas and heat. The ash is mostly formed by the inorganic constituents of the waste and may take the form of solid lumps or particulates carried by the flue gas. The flue gases are cleaned of gaseous and particulate pollutants before they are dispersed into the atmosphere, reportedly in adherence to National Standard Regulation QCVN 30:2012/BTNMT[6].

The domestic waste sorted out during the classification step at the composting plant (see Section 2.2.1) will be used as feedstock in the WtE facility. Inputs must achieve an average stable calorific value of about 11,000 kJ/Kg, and the moisture level of less than 25% before being loaded into the incinerator. Fuel oil is added to maintain the required calorific value of the feedstock and to maintain a stable temperature, ensuring complete combustion and preventing the formulation of dioxins and furans. Based on information from the 2022 EIA, the fuel oil consumption for the 8400 kg/h incinerator is 200 to 600 kg/h and the oil feeder for burner is 4,000L.

Waste is mixed and put into the centralised waste bunker by an excavator. Waste is picked up by grab buckets and fed into the feed hopper. With the doors open, and the waste is pushed into the incinerator by a hydraulic lever and sliding door. The system controls the exhaust fan to create negative pressure in the primary chamber to avoid flame eruption. After loading, the door closes and continues to the next cycle.

Waste is fed to the primary combustion chamber in batches and burned from the top down. The temperature controller in the primary chamber automatically adjusts the feeding time and keeps the temperature in the chamber stable. The average feeding time is 5 to 6 minutes per batch. Each batch loads about 700 to 850 kg of waste.

Primary Combustion Chamber

In the primary combustion chamber, the following processes occur: waste drying, waste gasification (thermal decomposition) and slag formation. At temperatures of 650 to 900°C, waste is gasified. The residual ash of inorganic substances and non-combustibles becomes ash and slag.

[6] It is noted that BIWASE has sought advice from its engineering consultant whom has provided recommended design changes that it believes can allow the WtE to operate within the emissions standards of the EU Industrial Emissions Directive (2010/75/EU) and the *Tokyo Standard/Japanese Air Pollution Control Act/Act on Special Measures against Dioxins.*

Waste Drying Process

As the temperature of the waste reaches 100°C, the process of moisture evaporation from waste occurs intensely. The waste combustion process starts and creates a gas mixture as the temperature increases.

In order to maintain a stable temperature of about 650 to 1,000°C in the primary chamber, the system automatic control device will regulate the temperature and heat supply control device, feed hopper system, air feeding system and will control primary nozzles to pump fuel oil into the incinerator.

Waste Burning Process

At a temperature of 650 to 900°C, waste is burnt or gasified. At this time, solid and liquid waste undergoes thermal decomposition to create gases. The heat decomposition processes are as follow: evaporation of water – pyrolysis – partial oxidation of the combustible substance. The remaining solid waste in the primary combustion chamber, after thermal decomposition, is called ash and slag, which contains mainly metal oxides and inert substances that are not combustible.

During the combustion process in the primary chamber, it is possible to supplement 10 to 20% of the required air from the air supply fan. The burner should be arranged to create a unified temperature in the incinerator and to increase combustion efficiency.

The provision of air from the grate bottom both cools the grate to avoid warping and provides heat to the primary combustion chamber, facilitating better combustion of waste and saving fuel. Due to the design of reciprocating grates, after the waste is put into the incinerator by the gravity and impact of the combustion process (as the air is reversed in the combustion chamber) as well as the waste mixture, the unburnt waste will move gradually towards the end of the incinerator and the ash will fall below the grate.

The mixing process is performed automatically. After the waste is burnt out at the end of the grate, the ash will be transferred to a container automatically by the chain conveyor.

After the pyrolysis of gases in the primary combustion chamber, the gases will be pushed into the secondary combustion chamber by the aerodynamic force

<u>Secondary Combustion Chamber & Gas Storage Tower</u>

The gaseous mixture which is transferred from the primary chamber to the secondary chamber contains combustible substances such as carbon monoxide (CO), hydrogen (H_2), residual oxygen (O_2), water vapour, organic compounds, etc. They continue to be burnt through the fuel supply process from secondary burner, heat, flammable substances in the air and supplied air volume. The temperature of the secondary combustion chamber is maintained at 1,050 to 1,200°C by five secondary burners and the gases fed to the incinerator. When the temperature of the secondary combustion chamber is lower than 1,050°C, the secondary nozzles and gas supply system automatically feed gases into the incinerator. They operate according to the system programming

principles when the temperature probe stays in the secondary combustion chamber long enough (⩾ 2 seconds) to support the complete removal of toxic wastes, especially dioxins, furans and polycyclic aromatic hydrocarbons (PAHs) and odours. The combustion process in the secondary combustion chamber is controlled by a thermocouple connected to an automatic temperature control system.

Similar to what occurs in the primary combustion chamber, the secondary nozzles feed fuel into the secondary combustion chamber. When the required temperature is reached, the nozzles are automatically removed by the hydraulic system to ensure the safety of the burners. The secondary nozzle and the air feeder are set up to create a vortex gas flow, which is very beneficial for mixing and contact during the combustion process and for temperature uniformity.

The gas storage tower deploys Selective Non-Catalytic Reduction (SNCR) technology, which can stabilise the heat flow and degas nitrogen oxides (NOx). SNCR system can remove NOx by the contact method using ammonia (NH_3) as the reducing agent, without a catalyst. The reaction occurs at high heat flow >850°C. Upon contact, a chemical reaction occurs and converts NOx in the exhaust gas into nitrogen gas and water vapour.

The method of hydrolysis of urea was selected to prepare NH_3 gas supplied for SNCR reactors. This method minimises the risk of accidents, fires and environmental pollution during NH_3 preparation. When the solution is sprayed into the device, wastes are retained at the bottom of the tower and discharged as a sludge. (Urea is stored on-site in 50kg bags, and is not considered a hazardous material.)

A urea solution is pumped into the gas storage tower with a concentration of 10 to 20% by a high-pressure gas nozzle to create a chemical reaction which can reduce NOx to nitrogen (N_2), and water (H_2O). The system will continue working until the gas monitoring system detects that the NOx value is <200 mg/Nm^3. Depending on the initial concentration of NOx, the NOx removal efficiency at the tower reaches 70-80%. The gas passing through the device is sprayed with NH_3 solution with high pressure to remove NOx.

Boiler System – Turbine – Generator System, Water Supply and Treatment System for Boilers

Boiler

After the gases pass through the storage tower, the bypass valve will open and close appropriately to feed the high-temperature gas flow into the boiler. When the boiler is shut down for maintenance and repair, the bypass valve will be adjusted to prevent gas flow from the boiler. This gas flow is passed to the rear gas treatment system.

Table 2-3 Summary of the Parameters of the Boiler for the Project Boiler

PARAMETERS OF THE SUPERHEATED BOILER OF THE INCINERATOR WITH A CAPACITY OF 8,400 KG/H	UNITS	PARAMETERS
Working pressure (max)	bar	30
Design pressure	bar	35
Water test pressure	bar	52.3
Temperature of water fed to the incinerator	^{0}C	105 – 110
Capacity	Ton/hour	25

After running through the water treatment system of the boiler, raw water will be supplied to the feedwater tank by pumping directly into the deaerator based on the water level in the deaerator. This serves as the make-up water to replenish the water-steam cycle. The water in the deaerator is automatically heated by steam extracted from the turbine to maintain the working temperature (105°C). This aims to completely remove the non-condensable gases in the water, and avoid chemical corrosion of the surfaces in the boiler. The water from the deaerator is pumped into the boiler, first through the heater and then into the steam drum. Water from the steam drum naturally flows through convection heat exchangers from the under collectors, receiving heat from smoke and partially generating steam. The steam-water mixture runs back into the steam drum due to the pressure difference between the downcomers and risers which are caused by the difference in density. To protect the superheater surface from corrosion due to high temperature, a convection heat exchanger is put at the boiler inlet, which reduces the smoke temperature at the superheater inlet.

The steam-water separator removes the water droplets mixed in the steam in the drum. Thereafter, the superheater raises the steam to the required temperature. The superheater is divided into two parts to facilitate the regulation of the superheated steam temperature, ensuring that it is not higher than the required value. There is a heat reducer in the middle of the two superheaters, where the water is automatically sprayed into the steam to keep the superheated steam temperature within the optimum range. The superheated steam is led to the steam turbine. At the turbine, when the steam expands to the vacuum pressure after the turbine, the kinetic energy generated will rotate the turbine and generator to generate electricity. The turbine has a separate control section that ensures a constant number of revolutions corresponding to the current frequency of 50Hz. The steam after leaving the turbine will enter the condenser, where it will be cooled by circulating water from the cooling tower, condensed and pumped back into the deaerator, forming a closed cycle. Water and steam samples are taken for quality testing on a periodic basis. Operational workers must follow operating procedures to ensure water quality.

Smoke valves are arranged in the following way: one bypass valve is added on each smoke line. When the boiler does not run, this valve can be opened and the incinerator runs normally. There are also isolation smoke valves that utilise heat at the boiler inlet and outlet. When the boiler is shut down for maintenance and repair, the valves in the front of and behind the boiler are locked while the bypass valves are opened. In case the boiler needs offloading, the bypass valve is partially and automatically open. Upon the start of the boiler, the smoke is fed slowly by gradually closing the bypass valve and opening the smoke valve before and after the boiler at the same time. These modes are programmed and controlled on the console. The smoke valves are opened and closed electronically.

2.3 LABOUR CONDITIONS AND GENDER DIMENSION

Employees and workers on-site are mostly from the local communities; as such, the Project does not provide accommodation for them. Furthermore, the Project does not have a canteen for employees however, uses industrial catering services who serve food cooked off-site.

- Senior management: 3 people;
- Office staff: 60 people; and
- Workers: 747 people.

It is expected that after the expansion project comes into operation (i.e. post construction), the Site would need about 1,019 employees and staff for its operation (an increase of 209 workers).

At the time of the visit to the Site, BIWASE at a group level reported their total number of official employees was 1,193 people, of which 165 were female and 1,028 were male. There are no workers engaged by third parties (i.e. agency workers) working for BIWASE (other than contractors performing installation / maintenance work on a project basis). Reportedly all workers working for BIWASE sign a contract either directly with BIWASE or with one of its branches.

In the absence of labour-related data specific to the Project being available during the Site visit, *Table 2-4* was extracted from an HR document for 2021 for the Waste Treatment Complex.

Table 2-4 Staffing Demographics

NO	LEVEL	NUMBER OF STAFF	RATIO (%)
I	**Split by Gender**	**1,193**	**100%**
1	Male	1,028	86,2%
2	Female	165	13,8%
II	**Classification by Educational Level**	**1,193**	**100%**
1	University and postgraduate	184	15.4%
2	College and intermediate level	88	7.4%
3	Technical workers receive vocational training	443	37.1%
4	Unskilled general labourers	480	40.0%

3 SCOPE OF WORK

3.1 OBJECTIVES

The objective of the Audit is to independently review and assess the E&S status and performance of the Project through an E&S compliance audit of BIWASE's existing ESMS and the existing facilities, as well as to identify compliance gaps, issues, improvement opportunities, and develop a detailed, time-bound corporate-level and facility-level Corrective Action Plan (CAP) agreed between ADB and BIWASE to support alignment with the Applicable Standards, as detailed below. The output of the Audit includes:

- This Environmental and Social Compliance Audit Report (ESCAR); and
- Corresponding corrective action measures, in the form of a CAP to address the key risks/issues identified during the Audit (incorporated in this ESCAR).

3.2 APPLICABLE STANDARDS

The Audit was conducted against the following standards, collectively referred to as the "Applicable Standards":

- ADB Safeguard Policy Statement (SPS) (2009);
- Applicable World Bank Group (WBG) Environmental, Health & Safety (EHS) Guidelines, including General EHS Guidelines (2007) and EHS Guidelines for Waste Facilities (2007);
- ADB's 2001 Social Protection Strategy, 1998 Gender and Development Policy, 2018 Access to Information Policy;
- Japan Environmental Governing Standards (JEGS) 2020[7];
- Applicable international standards, including International Labour Organisation (ILO) conventions ratified by Viet Nam at the time of proposal authorisation, covering core labour standards (ILO conventions 29, 98, 100, 105, 111, 138 and 182) and basic terms and conditions of employment (ILO conventions 1, 26 and 155); and
- Applicable local, national and international E&S laws, regulations and standards fully in force in Viet Nam at the time of Proposal authorisation (including international conventions fully ratified), which are further detailed below.

It should be noted that the Audit focused on identifying those issues that are most significant for the potential transaction in relation to the Applicable Standards.

[7] https://govtribe.com/file/government-file/attach-4-jegs-2020-dot-pdf has been used as a reference due to Japan International Cooperation Agency (JICA)'s involvement in the Project. It is noted that Japan is an Organisation for Economic Co-operation and Development (OECD) country and therefore the air emissions standards are considered in line with international standards albeit a deviation from the ADB SPS

A list of key Vietnamese legislation relevant to the Project is listed in Annex E: Vietnamese Legal Framework.

3.3 SCOPE

The focus of the Audit has been on understanding any significant E&S issues in relation to the Project (commensurate with its nature and scale) and any E&S issues that may present a concern to ADB in terms of notable non-compliance against the Applicable Standards or a potential significant E&S-related reputational risk (as far as can be reasonably foreseen). Key relevant national laws and regulations in Viet Nam relating to environment, health & safety (H&S), land acquisition, relocation of affected persons, Indigenous Peoples (where applicable), labour and gender issues have been considered.

3.4 METHODOLOGY

A staged approach was undertaken for the Audit as detailed below:

3.4.1 TASK 1: PROJECT INITIATION AND PREPARATION

A kick-off call was held with the Client, ADB and IBIS on 20 May 2022 via teleconference. An Information Request List (IRL) was provided to the Client in advance of this call and discussed during the meeting. The Client also supported the planning and arrangement of the visit to the Site (and the Project) and provided an initial set of documents for review.

3.4.2 TASK 2: DOCUMENT REVIEW

Under Task 2, a review of documentation supplied by the Client and publicly available information was undertaken. A list of key documents reviewed by IBIS is provided in *Annex A: Key Document Review List*. Additionally, an External Factors Review is included as *Annex C: Reputational Risk Review*.

3.4.3 TASK 3: INTERVIEWS WITH BIWASE MANAGEMENT AND SELECTED EXTERNAL STAKEHOLDERS

External stakeholder interviews were held with representatives of BIWASE and Project stakeholders during the Site visit.

3.4.4 TASK 4: SITE VISIT

A three-day visit to the Project was conducted by IBIS between 2 and 4 June 2022 to further understand the operations of the Site, the Project and its setting. Activities undertaken during the visit to the Site included:

- A brief introductory meeting to understand the historical activities, current operations and known future plans and operations of the Site and the Project;
- An accompanied tour of the Site, including inspections of the Project areas (i.e. the WtE facility and the composting process);

- A tour of the Site perimeter by car;
- Interviews and discussions with knowledgeable personnel at the Site;
- Accompanied visits to local community representatives, stakeholders and interviews with members of nearby households all located near the Site; and
- A review of documentation made available on-site.

During the visit to the Site visit, the assessors were accompanied by personnel from BIWASE. Photographs were taken during the visit and are presented in *Annex D: Photolog*.

During the visit interviewed knowledgeable persons can be largely divided into the following three groups:

- Representatives of BIWASE ("Site Representatives");
- Representatives of Commune Peoples Committee; and
- Selected members of the community with premises close to or adjacent to the Site.

Further details of the interviewees are provided in *Annex B: List of Interviewees / Site Visit Participant List*.

3.4.5 TASK 5: REPORTING

Following the completion of Tasks 1 to 4 above, this report was produced to document the Audit including the findings with recommendations, as appropriate, for additional work to support the Project in aligning with the Applicable Standards in the form of a CAP.

The focus of the Audit has been on assessing those issues that may present the most significant areas for non-compliance or present an obvious potential E&S related reputational risk issue. In order to assist with setting out the context of non-compliances identified, a colour-coded risk ranking has been applied to the findings, as presented in *Table 3-1* below. The risk rankings consider the potential risks and impacts reasonably associated with the components under review.

Table 3-1 Compliance Risk Rating

DEFINITION	COMPLIANCE RISK LEVEL	
No significant issues identified with respect to alignment with the Applicable Standards, or an item that appears to be not applicable and as such does not have an identified compliance risk.		No issues
Item of non-alignment with the Applicable Standards, however, is unlikely to create a material E&S impact, although should be rectified as a compliance matter.		Low
Item of non-alignment with the Applicable Standards and is required to have additional documentation, improved management measures or allocation of responsibilities to reduce the risk, and if left unaddressed has the potential to escalate to a high-risk issue. Item with potentially limited E&S risk/impacts that are few in number, generally site specific, largely reversible and are likely to be able to be managed through mitigation measures.		Medium
Clear significant item of non-alignment with the Applicable Standards that has the potential (or has already) to lead to a significant adverse an E&S impact(s). Has the potential (or has already) to lead to adverse media and/or NGO attention. Has the potential to trigger legal action, may lead to a major environmental incident, or may result in fatalities/serious injuries or have irreversible E&S impacts (e.g. clearance of natural forests). May require significant expenditure (>USD100k) to address the gap and align with the Applicable Standards.		High

4 ENVIRONMENTAL AND SOCIAL COMPLIANCE REVIEW OF BIWASE ESMS

4.1 Summary of the Corporate ESMS Structure

Table 4-1 and *Table 4-2* below present the findings from the Corporate ESMS Audit comprising of an assessment of the corporate ESMS and policies of BIWASE and key E&S topics at the corporate level. Note that in the sections below, references to ADB's Safeguard Principles / Requirements are presented in an abbreviated form in view of space constraints, so the full documents should be referred to where further detail is required[8]. The Site-level ESMS at the is discussed in *Section 5* of this report.

[8] https://www.adb.org/sites/default/files/institutional-document/32056/safeguard-policy-statement-june2009.pdf

4.2 ASSESSMENT OF CORPORATE ESMS AND POLICIES

Table 4-1 Assessment of Corporate ESMS and Policies

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
1	**Environmental & Social Policies**				
	Ensuring that E&S Safeguard requirements are incorporated into the ESMS including to comply with ADB SPS and host-country environmental & social laws and regulations (including those laws implementing host country obligations under international law).	ADB Safeguard Policy Statement, V. Safeguard Policy Statement	The Company has an integrated QSHE management system manual which covers ISO 14001:2015 (an environmental management system certification), ISO 45001:2018 (an occupational health & safety management system certification) and ISO 9001:2015 (a quality management system certification) for the Site. BIWASE's ISO 14001 certification is valid until 3 March 2025, ISO 45001 is valid until 21 February 2025 and ISO 9001 certification is valid until 10 January 2023. The manual describes the Company's commitment, roles and responsibilities, and steps for identifying and addressing any risks and Occupational Health and Safety (OHS) hazards as part of the risk assessment process. In addition, the Company has developed a risk assessment document covering various operations on-site, which was sighted by IBIS on-site. The environmental, social, health and safety guidance documents which have been developed for the Company's waste treatment branch include the following: • Quality Policy; • Environmental Policy; • OHS Policy; • Recruitment Process including seasonal personnel; • Document Control; • Training; • Legal compliance; • Monitoring and measuring environmental performance; • Risk Assessment and Hazard Identification; • Emergency response to chemical spills, fires, occupational accidents, power accidents, wastewater incidents, biogas leaks etc.; • Description of construction and repair infrastructure, contract for waste collection and transport, operation of centralized wastewater treatment system, industrial waste treatment, development and implementation of brick production, commercial concrete production etc.; • Complaints management; and • Consultation and information exchange. The environment policy commits to effective waste treatment and pollution prevention, through the implementation of the following: • Provide sufficient resources for effective waste treatment and pollution prevention; • Ensure quality of service, meeting customer's and regulator's requirements; • Conduct regular management review to ensure effective implementation of ISO14001:2015; and • Ensure awareness of employees on the importance of environmental protection. The OHS policy commits the company to:	Medium	At the corporate level, BIWASE shall review the implementation of its QSHE management system and EHS resources allocated to the implementation at the Site, and identify areas of improvement to ensure adequate translation of the corporate ESMS to the facility level. Specific actions include, at the minimum: • Review the need for additional EHS resources at the Site level given that there is currently only one dedicated EHS person for a workforce of approximately 1,000; • Conduct refresher training for personnel involved in EHS matters at the Site level; • Conduct a root cause analysis and further investigation into the issues identified in this ESDD including implementation of mitigation and management measures required; and • Conduct more frequent EHS performance reviews/audits on Site and recommend improvement / follow-up actions as necessary (e.g., every 6 months until performance level improves). IBIS would recommend that BIWASE embarks upon a safety diagnostic exercise with an external consultant. The work would involve engaging senior leadership within the Company in a series of workshops that highlight unsafe work practices on the site and demonstrate the risks and potential consequences of the behaviours of BIWASE staff and/or contractors. Engagement would be with C-Suite / Senior Management and its purpose would be to reinforce safety culture at the Site with a view to empowering the EHS functions to intervene more readily where unsafe acts are witnessed. Safety transformation requires the visibility of Senior Management at the Site to drive home the message about what is unacceptable in terms of safety behaviours on site. ***CAP #1*; Medium** Despite the relatively low risk of child or forced labour, it is recommended that BIWASE develops policies around prohibition of child or forced labour and human rights, including management of its contractors to ensure that child and forced labour is prevented in its supply chain. ***CAP #2*; Medium** Please also see site-specific commentary in *Section 6.2.*

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
			• Providing healthy working conditions to prevent injuries and diseases; • Eliminating OHS hazards and minimising OHS risks; • Ensuring the engagement of employees and employees' representatives; • Complying with laws and regulations; • Making continuous improvements; and • Ensuring awareness of employees on the OHS policy. Whilst the management system is generally well documented and certified, based on IBIS' assessment, the management systems are not fully implemented on-site, as would be expected, in line with these certifications. This is evidenced by (also refer to details in *Section 5.1*): • Poor record keeping. The Corporate ISO Committee does not keep inspection records (reportedly these are only kept at BIWASE's sites) and these were sighted at the Site during the visit; • Need for additional EHS resources at Site level – there is currently one dedicated EHS person for a workforce of approximately 1,000; and • Generally, safety procedures are poorly implemented. Please also see the Site-specific commentary in *Section 6.2*. <u>Human Resources Policies</u> In addition to an Employee Handbook, which provides policy and guidance to staff on working hours, leave, holidays, workplace rules and prohibited actions, workplace safety and hygiene, and sanctions for violation, the following policies and procedures have been developed: • Recruitment procedure; • Training manual; • Salary review and promotion procedure; and • Emulation and commendation procedure / Group Rewards and Recognition Guide. Based on a review of these HR-related policies and procedures, it is considered that these policies and procedures are generally suitable to the nature and scale of the operational activities of the Company for management of labour matters and aligned with the Applicable Standards. These Company-level policies are available to all staff via the Company's bulletins. The policies are included in the induction training for new hires. There is no explicit provision on child labour and forced labour, however it is noted that the recruitment policy set out the qualification and the minimum age (18 years old) for the candidates, which rules out the potential of child labour and forced labour. Refer also to details in *Table 5-4.*		

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
2	**Screening, Categorisation and Review**				
	Ensuring that policy requirements are implemented throughout the lifecycle of projects including screening of projects, categorisation (according to the ADB SPS), impact assessment and development of management and mitigation programs. This is in order to manage and address all relevant social and environmental risks and impacts of its business and operations, in particular the issues identified in Safeguard Requirements 1 to 3. Use a screening process for each proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment so that appropriate studies are undertaken commensurate with the significance of potential impacts and risks.	ADB Safeguard Policy Statement, V. ADB SPS, H. General Corporate Finance, 17 (i) (ii) ADB SPS, Requirements 1 to 3 ADB Prohibited Investment Activities List	There is no specific management system in place for screening and categorisation of projects within the corporate ESMS. The Company relies on the Vietnamese EIA system for the assessment of environmental impacts of any projects it develops. Moreover, for social impacts relating to the land acquisition or impacts to indigenous peoples, the Vietnamese legal framework is utilised.	Low	Develop a system for the screening and categorisation of projects in line with the ADB SPS including assessments for the three criteria – Environment, Land Acquisition and Indigenous Peoples – to be applied to all future developments. The system should also be used to screen potential expansion activities against the ADB PIAL. BIWASE could develop a policy document or SOP for future projects where BIWASE is seeking ADB financing such that the EIA should be scoped to align with the ADB SPS (e.g. conducting climate risk assessments, establishing a more robust baseline data such as for air quality, developing a generic construction EMP that includes a monitoring program which can be tailored to any construction works that will be carried out by any of BIWASE business lines or facilities, even if construction EMP or monitoring is not required per the domestic EIA etc.) ***CAP #3*; Low**
3	**Organisational Structure and Staffing**				
	Ensure that there is sufficient institutional or organisational arrangements to effectively implement the ESMS. Including providing training and capacity development as required.	ADB Safeguard Policy Statement, V. ADB SPS, Environmental Safeguards, 4. ADB SPS, Environmental Safeguards, 3.	Key observations around organisational structure and staffing relating to E&S matters: • On a corporate level, BIWASE currently have no dedicated E&S personnel, however, the Company has successfully managed to maintain ISO certifications for the Waste Treatment Branch. Based on the information available, the systems are not consistently and effectively implemented; • BIWASE has a corporate ISO Committee, which includes the CEO, HR Manager, and Training Manager. Mr. Le Nhan, the BIWASE Training Manager, carry the main responsibility for ISO systems and is in charge of duties related to maintaining the ISO certifications. The function of the ISO Committee is mostly facilitating, obtaining, re-assessment and maintaining of the ISO certificates (liaising with certification bodies, liaising with branch's ISO committee, processing payment, issuing company policies on environment/quality/OHS); • The HR Department is in charge of communication with, or reporting to, the various regulatory authorities on relevant E&S matters when necessary; • Ms. Ho Thi Thanh Thuy, Deputy Manager of HR and Administration at the Waste Treatment Branch is in charge of OHS at the Site (as well as other BIWASE sites), and provides technical advice when the company needs assistance with OHS matters. She is the "unofficial" OHS person for the whole of BIWASE. Based on meeting minutes of a Safety - Environment and Social Committee meeting dated 19 Apr 2022, Ms. Thuy serves as the liaison between corporate and site on OHS matters. Based on the conversations with IBIS, Ms. Thuy generally demonstrated a good understanding of OHS regulatory requirements; • There is reportedly a corporate safety team, led by Mr. Le Nhan. However, its operation is not very clear, except conducting a 6-monthly EHS inspection of branches; and • The ISO Department has staff handling ISO 9001, ISO 14001 and ISO 45001 implementation. It appeared that the focus is on paperwork rather than practice-based operation of the relevant management systems.	Medium	At the corporate level, BIWASE shall review the need to have dedicated E&S personnel. BIWASE shall also review the EHS resources allocated to ESMS implementation at the Site, and identify areas of improvement to ensure adequate translation of the corporate ESMS to the facility level. Please also see site-specific commentary in *Section 6.2*.

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
4	**Training Requirements**				
	Organise training to strengthen the capacity to manage environmental and social risks as part of the implementation of the ESMS.	ADB Safeguard Policy Statement, V.	The integrated management system handbook describes the Company's intention to ensure that all employees involved in the implementation of the integrated management system have the necessary competence, which will be considered and addressed based on appropriate recruitment and training processes. The Company also aims to ensure that all personnel are aware of its Quality and Environmental Policy, goals and relevant matters such as significant environmental aspects, impact of non-conformities etc. Specific to the Site, rules are provided to all staff upon recruitment which they are required to sign and acknowledge. There is also a matrix to describe Personal Protective Equipment (PPE) requirements for various levels of staff. Refer to item 2 in *Table 5-1* for details on the training schedule for the Site, including OHS and ISO related training for relevant personnel. Based on the Site visit, it appears that the site-specific ESMS was not consistently implemented, and no contractor management practices were observed (see item 8a in *Table 5-1* for details).	Medium	Ensure that recruitment and training processes adequately address the HSE competencies required for the HSE personnel. This could include the additional or improved internal management policies and procedures to be developed to address the gaps identified in this ESDD. ***CAP #4*; Medium**
5	**Monitoring and Reporting**				
	Implement E&S Safeguards and to prepare periodic monitoring reports on the performance of their implementation including: Establish and maintain procedures to monitor the progress of implementation of safeguard plans; Verify the compliance with safeguard measures and their progress toward intended outcomes; Document and disclose monitoring results and identify necessary corrective and preventive actions in the periodic monitoring reports; Follow up on these actions to ensure progress toward the desired outcomes; Retain qualified and experienced external experts or qualified NGOs to verify monitoring information for projects with significant impacts and risks; Use independent advisory panels to monitor project implementation for highly complex and sensitive projects; and Submit periodic monitoring reports on safeguard measures as agreed with ADB.	ADB SPS, B. Policy Delivery Process, 57. Monitoring and Reporting	At a group level, the Company produces annual reports[9] and releases financial statements among other information disclosed[10]. Based on the 2021 annual report, BIWASE reports on its production and business activities including environmental and social impact monitoring (management of raw materials used, energy and water consumption, compliance with relevant regulations etc.), initiatives related to health, safety and welfare of employees, employees training, and initiatives / investments to the communities / community development. The following monitoring/review programs are reportedly being implemented: • 6-monthly EHS corporate inspection by the corporate safety team/ISO team; • 3-monthly site-level inspection by site safety team; • 2-weekly workshop-level self-inspection at each workshop; and • Annual external ISO audits by BSI. These inspections are documented in checklists, and findings are reportedly discussed and followed-up at weekly management meetings at the branch. BSI conducted an ISO 14001 and ISO 45001 combined audit for BIWASE in November 2021, which was conducted remotely. Based on the report, one minor non-conformity was identified (a lack of adequate and timely update of identified risks and opportunities (i.e. the Covid-19 situation response in 2021)) and no major non-conformities were identified during the audit. Overall, the management system was assessed as meeting the requirements of the relevant international standards. Other key findings included:	Medium	BIWASE to close out the items identified in the ISO audits. Please also see site-specific commentary in *Section 6.2*.

[9] 2021 Annual Report: http://www.biwase.com.vn/FileScan/B%C3%81O%20C%C3%81O%20TH%C6%AF%E1%BB%9CNG%20NI%C3%8AN%20N%C4%82M%202021%20BIWASE.pdf
[10] http://www.biwase.com.vn/QuanHeCoDong/CongBoThongTin?page=1

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
			• Policy and objectives are established and are compatible with the strategic direction and the context of the organisation; • The documented information, processes and activities were planned to meet the standard requirements; • Strong commitment from top management; • Kaizen process is conducted to improve the processes and activities; and • The operation control measures are defined, implemented, and maintained in order to eliminate risks. BSI conducted a remote ISO 9001 audit for BIWASE in September/October 2021, including various BIWASE facilities. Based on the report, two opportunities for improvement were identified for the Waste Treatment Complex and no major non-conformity was identified. The opportunities for improvement are suggestions to improve the customer feedback management process (i.e. handling of complaints) and proper documentation of customer satisfactory surveys to facilitate data analysis. Based on IBIS' observations on-site, it is considered there is a disconnect between the written procedures included in the management systems and the day-to-day operations. The findings from both the monitoring and review of the management system point to a lack of understanding and capacity for the policies and procedures to be implemented effectively, maintained and then updated, as required. Whilst the personnel encountered by IBIS in the process of this ESDD were considered to be generally aware of the relevant topics, it is considered that there is a lack of capacity to cover the full extent of the BIWASE's operations effectively and therefore EHS aspects appear to be somewhat under-resourced (there is currently one dedicated EHS personnel for a workforce of approximately 1,000). Refer to item 8a in Table 5-1 for further details.		

4.3 Assessment of Key E&S Topics at Corporate Level

Table 4-2 Assessment of Key E&S Topics at the Corporate Level

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
1	**Pollution Prevention and Abatement**				
	Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognised standards such as the World Bank Group's Environmental, Health and Safety Guidelines. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage. Avoid the use of hazardous materials subject to international bans or phaseouts. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.	ADB Safeguard Requirement 1: Environment	Please refer to the Site-specific commentary in *Section 5.1*.	Low	None required at the corporate level, however, please see the Site-specific commentary in *Section 6.2*.
2	**Biodiversity Conservation and Sustainable Natural Resource Management**				
	Do not implement project activities in areas of critical habitats, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts are mitigated. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. In an area of natural habitats, there must be no significant conversion or degradation, unless (i) alternatives are not available, (ii) the overall benefits from the project substantially outweigh the environmental costs, and (iii) any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development, and management of renewable natural resources.	ADB Safeguard Requirement 1: Environment	Please refer to the Site-specific commentary in *Section 5.1*.	Low	None required at the corporate level, however, please see the Site-specific commentary in *Section 6.2*.
3	**Health & Safety**				
	There is an importance of providing safe and healthy working conditions to prevent accidents, injuries and disease. It asserts on the establishment of emergency preparedness and response measures to avoid or minimize risks to health and safety of individuals and communities. Social Protection Strategy. The strategy recommends the project proponent provides a safe and healthy working environment for its employees as well as its contractors/ subcontractors to comply with the national labour laws and take measures to comply with the core labour standards. It stresses on accounting for risks inherent to the project activities by identifying hazards, providing preventive and protective measures and trainings to staff, documenting near miss incidents and accidents and an Emergency Response Plan (ERP) to handle potential emergencies. The ADB SPS mandate that the identified Occupational Health and Safety issues must be identified, assessed, and addressed in an EIA for proposed projects.	Safeguard Requirement 1: Environment Social Protection Strategy	The Company has an OHS policy at a corporate level, relevant ISO certifications, and risk assessments / hazards identification processes in place (refer to item 1 in *Table 4-1* for details). As noted in *Section 4.2,* whilst the Company's management system is well documented and certified, based on IBIS' assessment, the management systems are not implemented on Site as would be expected in line with these certifications. Refer to item 8a in *Table 5-1* for the Site-specific commentary.	Medium	Please see the Site-specific commentary in *Section 6.2*.
4	**Physical Cultural Resources**				
	Conserve physical cultural resources and avoid destroying or damaging them by using field-based surveys that employ	Safeguard Requirement 1: Environment	It would be prudent to include a chance find procedure in the Corporate ESMS which should be cascaded down to branches	Low	Include a chance find procedure in the ESMS for future construction activities by BIWASE. ***CAP #5*; Low**

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
	qualified and experienced experts during environmental assessment. Provide for the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.		within the corporate structure for use in and expansion of existing facilities or during the construction of any new facilities.		
5	**Land Acquisition and Resettlement Safeguards**				
	SPS Appendix 2 Safeguard Requirements 2: Involuntary Resettlement para 25 indicates that the client is encouraged to acquire land and other assets through a negotiated settlement wherever possible, based on meaningful consultation with affected persons, including those without legal title to assets. A negotiated settlement will offer adequate and fair price for land and/or other assets. The client will ensure that any negotiations with displaced persons openly address the risks of asymmetry of information and bargaining power of the parties involved in such transactions. For this purpose, the borrower/client will engage an independent external party to document the negotiation and settlement processes. The borrower/client will agree with ADB on consultation processes, policies, and laws that are applicable to such transactions; third-party validation; mechanisms for calculating the replacement costs of land and other assets affected; and record-keeping requirements.	Safeguard Requirement 2: Involuntary Resettlement	The Company does not have a formal policy on land acquisition and resettlement. It is noted that depending on each project, the Company either acquires the land through willing buyer/willing seller process or follow the government-led land acquisition process. Based on the evidence gathered it appears that previous land acquisition processes have followed the government led process in Vietnam however valuations of land acquired have been above market rate. Based on the discussions held during the Audit there have been no targeted livelihood restoration programmes or resettlement activities undertaken by the Company to date. Reportedly the policy is to follow the government process. There is no policy on additional support beyond the compensation paid to Ahs. Please refer to site-specific commentary in *Section 5.2.*	Low	The Company shall develop a policy relating to land acquisition and resettlement that includes provision to make best efforts to supplement the government led land acquisition process to achieve compensation for loss of assets at full replacement value and the creation of livelihood programmes that ensure displaced persons are able to restore livelihoods to pre displacement levels following any impacts from Company developments. ***CAP #6*; Low**
6	**Identifying and Managing Impacts on Indigenous Peoples**				
	Screen all projects to determine whether or not they have potential impacts on Indigenous Peoples. For projects with impacts on Indigenous Peoples, an Indigenous Peoples plan will be prepared. The plan's level of detail and comprehensiveness will be commensurate with the degree of impacts. The degree of impacts is determined by evaluating (i) the magnitude of the impact on Indigenous Peoples' customary rights of use and access to land and natural resources; socioeconomic status; cultural and communal integrity; health, education, livelihood systems, and social security status; or indigenous knowledge; and (ii) the vulnerability of the affected Indigenous Peoples.	Safeguard Requirement 3 – Indigenous Peoples	The Company does not have a corporate level policy on indigenous peoples / ethnic minorities. Based on the evidence gathered it appears that impacts of this nature will be addressed via the regulatory framework in Vietnam and via dialogue with the Commune Peoples Committees in the province. Given the nature of the Company, this is not considered to be a significant aspect. Please refer to site-specific commentary in *Section 5.3.*	No Issues	None
7	**Main Stakeholder Groups and Stakeholder Engagement**				
	Engage with communities, groups, or people affected by proposed projects, and with civil society through information disclosure, consultation, and informed participation in a manner commensurate with the risks to and impacts on affected communities. This: Begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle; Provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; Is undertaken in an atmosphere free of intimidation or coercion;	ADB SPS, B. Policy Delivery Process, 53, Consultation and Participation ADB's Public Communications Policy 2011	Refer to item 3 of *Table 5-1* for Site-specific external stakeholder engagement activities.	Low	Please see relevant Site-specific commentary in *Section 6.2.*

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
	Is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; Enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.				
8	**Gender and Development**				
	The Gender & Development Policy recognises the need to improve the status of women and to promote their potential role in development practices. The strategy of the policy is based on the consideration of social justice and gender equity that investment in women is vital to achieving economic efficiency and growth. The key elements of the policy relates to the following: *Gender Sensitivity*: Focuses on how the operations of the project proponent will affect women and men, and to take into account women's needs and perspectives in planning its operations. *Gender Analysis*: Focuses on the systematic assessment of the impact of a project on men and women, and on the economic and social relationship between them. *Gender Planning*: Focuses on specific strategies that aim to bring about equal opportunities for men and women. *Gender Mainstreaming*: Focuses on the consideration of gender issues in all aspects of the project proponent's operations, accompanied by efforts to encourage women's participation in the decision-making process in development activities. *Agenda Setting*: Focuses on the formulation of strategies to reduce gender disparities and in developing plans and targets for women's and girls' education, health, legal rights, employment, and income-earning opportunities.	ADB Gender and Development Policy (1998)	In the activities of BIWASE, it was reported that there is equality in employment. In addition to provisions as required under Government regulations (e.g. maternity leave), BIWASE provides additional benefits for female workers who are pregnant, with one month of leave before giving birth on full pay. BIWASE also has its own specific regulations for female employees to meet the requirements of the Labour Code 2021. Viet Nam's Decree No 145/2020/ND-CP dated 14 February, 2020 covers elements of female workers' entitlements, benefits and sexual harassment policy. Whilst no sexual harassment policy has been formally developed or established by BIWASE, the Company indicated that prohibition of sexual harassment is regularly communicated to all of its workers and that no sexual harassment cases have ever been raised or reported during the company's history. In addition, Viet Nam has ratified the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) in 1982. Refer to item 9 of *Table 5-4* for Site-specific gender related initiatives.	Low	As a best management practice in line with the Applicable Standards, it is recommended that a sexual harassment policy be established by BIWASE. ***CAP #7*; Low**
9	**Labour and Social Protection**				
	The ADB's SPS requires incorporation of social dimensions, such as core labour standards and gender issues, which are included in ADB's Social Protection Strategy. This also requires compliance with applicable labour laws in relation to projects by: Carrying out activities consistent with the intent of ensuring legally permissible equal opportunity, fair treatment and non-discrimination in relation to recruitment and hiring, compensation, working conditions and terms of employment for its workers (including prohibiting any form of discrimination against women during hiring and providing equal work for equal pay for men and women engaged by the client/borrower; and Not restricting its workers from developing a legally permissible means of expressing their grievances and protecting their rights regarding working conditions and terms of employment; and Engaging contractors and other providers of goods and services: who do not employ child labour or forced labour; who have appropriate management systems that will allow them to operate in a manner which is consistent with the	Social Protection Strategy (2001) ADB Gender and Development Policy (1998) Public Communication Policy (PCP) (2011)	Viet Nam has ratified all nine fundamental ILO core conventions. In addition, Viet Nam has ratified the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) in 1982. <u>HR Policies and Procedures</u> At a Company-level, in addition to an Employee Handbook, which provides policy and guidance to staff on working hours, leave, holidays, workplace rules and prohibited actions, workplace safety and hygiene, and sanctions for violation, the following policies and procedures have been developed: • Recruitment procedure; • Training manual; • Salary review and promotion procedure; and • Emulation and commendation procedure / Group Rewards and Recognition Guide. According to BIWASE, formal employment contracts are established for employment of all workers by BIWASE, as required under Vietnamese law. The general labour agreement defines general employment and labour policies, including working hours for indirect	Low	

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
	intent of (a) ensuring legally permissible equal opportunity and fair treatment and non-discrimination for their workers and (b) not restricting their workers from developing a legally permissible means of expressing their grievances and protecting their rights regarding working conditions and terms of employment; and (c) whose subcontracts contain provisions, which are consistent with the two preceding paragraphs above.		workers (i.e. Monday – Friday from 07:30 – 11:30hrs and 13:30 to 17:00hrs; Saturday from 07:30 – 11:30hrs), policies regarding remuneration, rewards, annual leave and holiday, and working conditions for pregnant women. Direct workers at the Waste Treatment Complex typically work in shifts (12-hour shifts and 24hrs between shifts, plus one off-day per week) with a total working time of 48 hours per week and no overtime is expected. It should be noted that the ILO encourages multinational enterprises to progressively reduce the normal hours for a five-day week from 48 hours to 40 hours, taking into account national conditions and practice, as well as the conditions in the particular sector of operation, in order to avoid any reduction in wages. In this case, BIWASE is considered in compliance with legal regulations and also in line with ILO limit. According to BIWASE, the minimum age of workers employed by BIWASE is 18 years or above and this is also included in the recruitment procedure. Based on a review of these HR-related policies and procedures, it is considered that these policies and procedures are generally suitable to the nature and scale of the operational activities of the Company for the management of labour matters. The minimum wage of direct employees is VND5,732,000 (equivalent to approximately USD247) per month (exclusive of benefits and allowances) for unskilled workers work for simple jobs such as janitors. This wage is above the legal minimum wage of VND4,400,000 (equivalent to approximately USD189) per month set by the government for Binh Duong Province. Reportedly the average monthly salary of direct workers is over VND9,000,000 (equivalent to approximately USD387) per month and the salary between men and women are equal (equal pay for equal work). For workers carrying out heavy and hazardous work, a supplement of 10% to 15% is added to their monthly salary, depending on the nature of the job. BIWASE conducts annual health checks for its employees. Additionally, for operations such as waste treatment, workers are provided with biannual health checks. This includes screening for occupational diseases (lung and hearing). The following items were also covered in the medical examination: cancer screening, Hepatitis B, bloods, and osteoporosis. For waste treatment workers who have worked for more than five years, BIWASE purchases additional healthcare benefits. <u>Internal Grievance Redress Mechanism (GRM)</u> BIWASE has an internal grievance mechanism which allows workers to log their grievances through their line manager and/or the Trade Union. According to the mechanism, once a grievance is received it will be processed according to the legal provisions for grievance resolution. Reportedly, there have not been any grievances officially lodged by workers. A grievance mechanism that has not been used can indicate that the system is ineffective (or not communicated) and that addition implementation work is required (e.g. raising awareness in the workforce). <u>Workers' Organisations</u> A trade union has been established under BIWASE to manage and protect workers' rights. Workers are entitled to register under the collective labour agreement of BIWASE, under which provisions, rules, regulations and rights are incorporated. The collective labour		Ensure communication of internal GRM to employees and implementation of the internal GRM, including maintaining a log for grievances. ***CAP #8*; Low**

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
			agreement has been submitted to the Department of Labour and Social Affairs for review and approval, as required by law. <u>Retrenchment</u> According to information provided by BIWASE, the Company has never had to undertake a retrenchment exercise. Based on currently available documented information, no retrenchment policy or employment termination related policy has been developed. According to the Labour Code, an employer has a legal responsibility to implement labour requirements stipulated in the Labour Code in the event of a unilateral termination of employment contract or retrenchment in case of changes in structure, technology or due to economic reasons. The agreement has been reviewed and approved by the responsible governmental department. It is however noted that there is no foreseeable retrenchment at BIWASE based on its current status. <u>Contractor Management</u> BIWASE has a regulation for contractor management (QD03/NSQT) as part of the ISO 45001 management system at the Site. However, there is no evidence available on its practical implementation. Refer to item 8a in *Table 5-1* for Site-specific observations. <u>Supply Chain</u> BIWASE does not have a supply chain management procedure, however, based on the work it is engaged in and the associated supply chains it is not considered to be a significant risk. The main suppliers used in the operation of the various technologies (e.g. liners for the landfill sites; dosing chemicals for the water treatment, etc) are well established and unlikely to be exposed to supply chains with an inherent risk related to child labour, forced labour or serious health & safety risks where there is sufficient visibility or leverage to address them.		According to the Labour Code, an employer has a legal responsibility to implement labour requirements stipulated in the Labour Code in the event of a unilateral termination of employment contract or retrenchment in case of changes in structure, technology or due to economic reasons. Even though the agreement has been reviewed and approved by the responsible governmental department, it is recommended that BIWASE incorporates explicit labour-related conditions in the event of an employment contract termination and retrenchment in both the collective labour agreement and individual employment contracts. Develop a retrenchment policy or employment termination related policy, including the need to conduct an analysis of alternatives to retrenchment prior to implementing any collective dismissals; should there be no viable alternatives to retrenchment, a retrenchment plan should be developed and implemented to reduce the adverse impacts of retrenchment on workers; and ensuring that all workers receive notice of dismissal and severance payments mandated by law and collective agreements in a timely manner. ***CAP #9*; Low** Refer to site-specific commentary in *Section 6.2*.
10	**Grievance Redress Mechanism**				
	Establish and maintain a grievance redress mechanism to receive and facilitate resolution of affected peoples' concerns and grievances regarding the project's environmental, affected persons and Indigenous Peoples concerns. The grievance redress mechanism should be scaled to the risks and impacts of the project. It should address affected people's concerns and complaints promptly, using an understandable and transparent process that is gender responsive, culturally appropriate, and readily accessible to all segments of the affected people.	ADB Safeguards 1: Environmental, 2: Involuntary Resettlement and 3: Indigenous Peoples	There is no documented transparent grievance mechanism for stakeholders to access if they wish to raise complaints or concerns in relation to the Company. No records of logged grievances are available for review. Refer to Site-specific commentary in *Section 5.1*.	Medium	Develop an external communications mechanism (or Grievance Redress Mechanism (GRM)) and ensure it is available/communicated to external stakeholders and maintain a log for grievances. ***CAP #10*; Medium**

5 ENVIRONMENTAL AND SOCIAL COMPLIANCE REVIEW OF THE PROJECT

At the time of the Site visit, the construction of the 8,400 kg/hour incinerator and boiler for the WtE facility was already completed, and the stack is operational; the construction / installation of the heat exchanger and turbine is well underway and expected to complete by December 2022. Construction for the new composting plant has also commenced, with the civil works, waste reception bunker, and foundations of the waste sorting line completed at the time of the visit to the Site.

5.1 ADB SPS Environment Safeguards

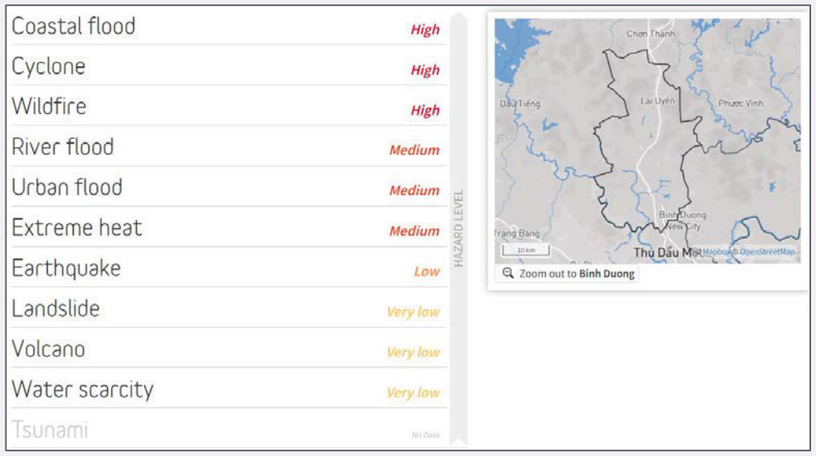
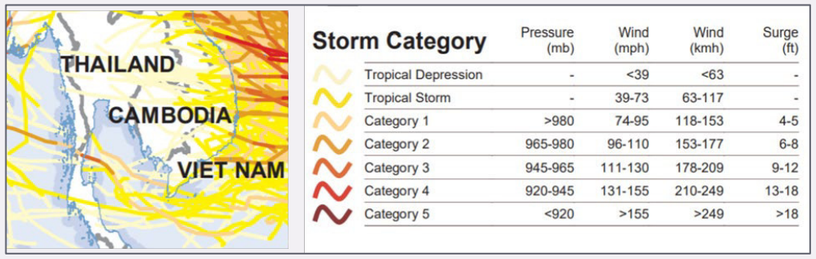
Table 5-1 ADB SPS Environment Safeguards

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
1	**Environmental Assessment**				
	Use a screening process for each proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment so that appropriate studies are undertaken commensurate with the significance of potential impacts and risks. Conduct an environmental assessment for each proposed project to identify potential direct, indirect, cumulative, and induced impacts and risks to physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues), and physical cultural resources in the context of the project's area of influence. Assess potential transboundary and global impacts, including climate change. Use strategic environmental assessment where appropriate. Examine alternatives to the project's location, design, technology, and components and their potential E&S impacts and document the rationale for selecting the particular alternative proposed. Also consider the no project alternative.	Environmental Safeguard, Policy Principles 1, 2 And 3 Law On Environmental Protection (55/2014/QH13)[11] Law On Water Resources No. 17/2012/QH13 Labor Law No. 10/2012/QH13 Law On Biodiversity No. 20/2008/QH12 Decree 40/2019/ND-CP Guiding The Implementation Of Some Articles Of The Law On Environmental Protection Decree 19/2015/ND-CP Guiding The Implementation Of Some Articles Of The Law On Environmental Protection. This Decree Provides Some General Provisions For Soil Contamination Management Irrigation Law (08/2017/QH14) Decree No. 201/2013/ND-CP Dated November 27, 2013 Of The Government Detailing Implementation Of A Number Of Articles Of The Law On Water Resources; Decree No. 38/2015/ND-CP Dated April 24, 2015 Of The Government On Management Of Waste And Discarded Materials. Decree 18/2015/ND-CP On Environmental Planning, Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Plan Circular 27/2015/TT-BTNMT On Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Plan Circular No. 25/2019/TT-BTNMT Dated December 31, 2019 Of MONRE On Elaborating Some Articles Of The Government's Decree No. 40/2019/ND-CP Dated May 13, 2019 On Amendments To Decrees On Guidelines For The Law On Environmental Protection And Providing For Management Of Environmental Monitoring	The Project is an expansion within the existing footprint of the Site. The Site was chosen in 2004 as a strategic solution to the waste management issues that were being experienced in the province. There is no plausible alternative to the Project as it is meant to alleviate the demand for solid waste disposal and treatment in the province. The Project involves development of an additional composting plant (840 tpd) and WtE facility (8,400 kg/hour or 201.6 tpd), bringing the overall waste management capacity of the Site from 6,216.8 tpd to 6,608.38 tpd. The domestic EIA for the Project was approved in 2019 covered the 8,400 kg/hour WtE facility, and the 2022 EIA included the 840 tpd composting plant; the 2022 EIA was approved in June 2022. In the 2022 EIA, BIWASE committed to implementing the mitigation measures and commitments in the approved EIA report to minimise adverse impacts on the environment. Based on IBIS' review of the 2022 EIA, it included the assessment for potential direct and indirect E&S impacts and safety risks from the implementation of the Project during the construction and operational phases for the two additional components. The key aspects of adverse E&S impacts and risks identified in 2022 EIA are briefly summarised as follows: During the construction phase, key E&S impacts were: • Generation of dust and air emissions (CO, CO_2, SO_2, VOC, NO_x, etc) by construction and transportation activities; • Generation of solid wastes including construction and domestic solid waste including hazardous waste; • Generation of wastewater by domestic activities, construction-related washing and cleaning activities, and run-off water; • Generation of high noise and vibration by operation of construction equipment; • Risks of community safety by transportation activities from the Project; and • Occupational health and safety and traffic accidents by construction and transportation of the Project. During the operational phase, key E&S impacts were: • Generation of dust and air emissions and odour from the composting plant and WtE incinerator; • Generation of domestic wastes, including solid and liquid waste from staff and workers; • Generation of solid waste from the compost production lines and ashes and debris from the incinerator; • Generation of dewatered sludge from the WWTP which will also treat wastewater from the Project; • Generation of wastewater by domestic activities, operation of composting plant, washing and cleaning activities, and run-off water; • Electrical problems and other issues in term of servicing and maintenance of the incinerator; • Occupational safety, fire and explosion incidents; and • Thermal pollution due to heat dispersion inside the facilities. The 2022 EIA was carried out in general guidance with the local regulatory requirements in Viet Nam. It described impacts and assessed combined effects on E&S components as a result of the Site in general, including the Project. The 2022 EIA describes measures for incident response for incidents related to wastewater, incinerators, and domestic solid waste (including operation of composting area, leachate collection system, fires or floods in landfills and collapse of landfill embankment). Based on the 2022 EIA, impacts on community health and safety were broadly assessed such as impacts from leachate, vectors and pathogens, spread of waste, and odour. It indicates that BIWASE will prepare a	No Issues	

[11] It is noted that the new Law on Environmental Protection (72/2020/QH14) is effective from 1 January 2022 and its guiding Decree 08/2022/ND-CP and Circular 02/2022/BTNMT effective from 10 January 2022, however, since the Project is initiated prior to the new Law on Environmental Protection becoming effective, the legal requirements (specifically those related to the EIA) applicable to the Project are the regulations issued prior to 2022. Per these new regulations, BIWASE will need to migrate its current individual environmental permits to a consolidated environmental permit, however the timeline is until 2027 or expiry of any individual permit, whichever comes first.

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
		Services Circular No. 36/2015/TT-BTNMT Dated June 30, 2015 Of MONRE On Management Of Hazardous Wastes	schedule of transport for all vehicles to avoid working during rush hours, not to exacerbate the traffic congestion as well as to select routes with minimal impacts to the local residential areas. Every week, BIWASE sends questionnaires to people living around the Site to ask for their opinions about odour and insects, for example, flies, and problems arising from the collection, treatment, recycling activities of waste at the Site. The questionnaires are given to the households in Quarter 1A, Quarter 1B, Quarter 3, Quarter 4, Chanh Phu Social Protection Center, Ben Cat Town and Ben Tuong Hamlet in Bau Bang District. Based on questionnaire responses collected from January 2019 to May 2021, there has been generally positive feedback particularly around pests and odour issues (see details in item #7c of this table). **Water Supply** Water supply for the Site comes from drilled wells which abstract groundwater. The groundwater abstraction permit no.51/GP-UBND was granted by issued by the Binh Duong DoNRE on 30 March 2020 allowing a total extraction of 950 m^3/day from the Pliocene aquifer. Based on existing operations, the total amount of water currently supplied in the Waste Treatment Complex from a combination of groundwater and the centralised wastewater treatment system is about 940 m^3/day. The water from the wells of the Waste Treatment Complex is mainly used for the sanitary and domestic use, for the incinerator emission treatment system, and some waste recycling systems, which amounts to about 217 m^3/day, and the water taken from the centralised wastewater treatment system is used in brick production and plant watering, and vehicle washing, which amounts to about 454 m^3/day. The water supply for the entire Site after the expansion will be about 330 m^3/day to 670 m^3/day from groundwater and about 657 m^3/day to 997 m^3/day from the centralised wastewater treatment system. **Flood Risk** According to the 2022 EIA, there has not been any record of flooding in the landfill cells of the Site since it was put into operation. If an incident did occur, water inside the flooded landfill cells would be pumped out into a concrete pond with a volume of 18,900 $m^{3,}$ lined with a 1.5 mm-thick layer of water-proof HDPE. Thereafter, the wastewater would be pumped to the Site's centralised wastewater treatment system for treatment. Potential flooding within the Site during the construction stage due to stormwater will be managed through construction of ditches for temporary storage of stormwater in the construction site which connects to the combined drainage system of the Waste Treatment Complex area. Based on the visit to the Site visit, this does not appear to pose a material risk given the Site setting. BIWASE, the local people and local authority during interviews indicated that no flooding incidents had occurred at the Site in the past, although no flood risk assessment has been conducted by BIWASE. Based on information from ThinkHazard![12], the three hazards which pose a risk level of *High* for Ben Cat district are coastal flood, cyclone and wildfire (see figure below). Note that the hazards are assessed at the district level. • The coastal flood hazard is classified as "high", meaning that potentially damaging waves are expected to flood the coast at least once in the next 10 years. Given the Site-specific information described above and the distance of the Site from the coast (approximately 110 km), there is no realistic likelihood of impact from coastal floods; • The cyclone (also known as hurricane or typhoon) hazard is classified as "high" according to the information that is currently available. This means that there is more than a 20% chance of potentially damaging wind speeds in the Site area in the next 10 years. However, as can be seen from second figure below depicting the patterns of tropical storms in the region in the past 50 years, the category of storms that tends to make landfall in the area is typically of lower strength and therefore likely poses a lower risk; and • The wildfire hazard is classified as "high" according to the information that is currently available. This means that there is greater than a 50% chance of encountering weather that could support a significant wildfire that is likely to result in both life and property loss in any given year.		

[12] https://thinkhazard.org/en/

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
			 Climate change profile for Ben Cat district *(Source: ThinkHazard!)*  Last 50 Years Tropical Storms in Asia-Pacific (1966 – 2017) *(Source: Reliefweb[13])*		
2	**Environmental Planning and Management**				
	Avoid, and where avoidance is not possible, minimise, mitigate, and/or offset adverse impacts and enhance positive impacts by means of environmental planning and management. Prepare an environmental management plan (EMP) that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organisational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators. Key considerations for EMP preparation include mitigation of potential adverse impacts to the level of no significant harm to third parties, and the polluter pays principle.	Environmental Safeguard, Policy Principle 4 Law on Environmental Protection (55/2014/QH13) Law on Water Resources No. 17/2012/QH13 Labor Law No. 10/2012/QH13 Law on Biodiversity No. 20/2008/QH12 Decree 40/2019/ND-CP guiding the implementation of some articles of the Law on Environmental Protection Decree 19/2015/ND-CP guiding the implementation of some articles of the Law on Environmental Protection. This decree provides some general provisions for soil contamination management Irrigation Law (08/2017/QH14)	The Company has an integrated QSHE management system manual which covers ISO 14001:2015, ISO 45001:2018 and ISO 9001:2015 for the Site. Whilst the management system is well documented and certified, based on IBIS' assessment, the management systems are not implemented on Site as would be expected in line with these certifications. Specific to the Project, an EMP was prepared and contains proposed mitigation measures to address the adverse impacts identified in the 2022 EIA during the pre-construction, construction and operational phases of the Project, including landfill closure phase, as briefly described below. In the 2022 EIA, BIWASE committed to implementing the mitigation measures and commitments in the approved EIA report to minimise adverse impacts on the environment. Environmental Management Plan (EMP) *Mitigation measures during the pre-construction phase* • The Project lies within the existing Waste Treatment Complex which has been in operation since 2004. Public disclosure of necessary information of the Project for the expansion of treatment capacity at the Site has been conducted with local communities, facilitated by the People's Committee of Chanh Phu Hoa ward, and with experts and scientists from Hanoi University of Natural Resources and Environment. Feedback has been provided through the consultation which have been responded to / incorporated into the submitted EIA accordingly. Please see item 3 in this table for further information.	Medium	Ensure an adequate HSE team is put in place to meet local regulatory requirements, implement HSE management measures, and BIWASE's management systems / ISO requirements. This should cover both the ongoing construction and existing operations on site. Refer to item 3 below. With respect to the WTE, in terms of design and operation of the WtE, BIWASE could consider the following improvements in the future to meet GIIP: • Enclosed tipping hall kept under negative pressure; • Tipping only when the tipping hall door is closed; and

[13] Taken from https://reliefweb.int/map/world/last-50-years-tropical-storms-asia-pacific-1966-2017

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
		Decree No. 201/2013/ND-CP dated November 27, 2013 of the Government detailing implementation of a number of articles of the Law on Water Resources; Decree No. 38/2015/ND-CP dated April 24, 2015 of the Government on management of waste and discarded materials. Decree 18/2015/ND-CP on environmental planning, strategic environmental assessment, environmental impact assessment and environmental protection plan Circular 27/2015/TT-BTNMT on strategic environmental assessment, environmental impact assessment and environmental protection plan Circular No. 25/2019/TT-BTNMT dated December 31, 2019 of MONRE on elaborating some articles of the Government's Decree No. 40/2019/ND-CP dated May 13, 2019 on amendments to decrees on guidelines for the Law on Environmental protection and providing for management of environmental monitoring services Circular No. 36/2015/TT-BTNMT dated June 30, 2015 of MONRE on management of hazardous wastes;	*Mitigation measures during the construction phase* • Mitigation measures for air pollution included: - Dust and emissions from construction activities: develop detailed construction plan to avoid overlapping between different stages of construction; maintain fencing wall around the construction work a height of 2m for noise and dust reduction; arrange a separate area with top cover and regular water spraying for building materials storage to reduce dust discharged from the (un)loading of materials; - Dust from vehicles: cover vehicles transporting building materials such as sand, stone, and cement, etc. to reduce dust discharge during transportation, park vehicles properly at designated areas with engines switched off when not in use, use fit-for-purpose vehicles and machinery, adhere to speed limit of 20 km/h within the Site with an interval of 5 minutes between trips to avoid kicking up dust; spraying of water on the roads during dry seasons; and - Welding smoke: workers to put on masks while working to avoid inhaling dust and metal vapours as well as goggles to resist ultraviolet and red glare of infrared rays. Masks and goggles are to protect eyes and face while gloves, long sleeved shirt and boots to prevent sparks from welding metal from contacting human body. • Mitigation measures for generation of wastewater included a dedicated area for washing vehicles and cleaning instruments and system that collects wastewater into a storage tank. After sedimentation, the water will be reused for dust control. The settled (and separated) sediment will be reused in ground levelling work after construction. In general, the wastewater generated from the construction phase is negligible compared to the overall wastewater generation on-site. • Mitigation measures for generation of solid waste included segregation and collection of produced wastes into 120-240 litre plastic containers with lids and stored at designated areas for the respective types of wastes (ordinary or hazardous) before treatment on-site daily. • Mitigation measures for noise and vibration reduction included ensuring that transport vehicles, construction equipment and machinery comply with relevant Vietnamese standards and are checked and maintained regularly, silencers / rubber gaskets / spring mounts to be installed for components that are likely to cause noise, especially machines with high capacity, vehicles to slow down when passing crowded areas and be equipped with mufflers, and workers to be equipped with suitable instruments and personal protection equipment when necessary (depending on tasks). • Mitigation measures for stormwater run-off included installation of ditches for temporary storage of stormwater which connect to the combined drainage system of the Waste Treatment Complex to minimise occurrence of floods within the construction area, development of a management plan to minimise the amount of oil and fuel discharged from vehicles and waste falling during the unloading process, especially in the proximity of the drainage system, and regular dredging and cleaning of the drainage system to ensure that domestic solid waste, reserved fuel and waste fuel will not cause blockages in the system. • Mitigation measures for traffic impacts included ensuring coordination of vehicles traveling in and out of the Site to prevent bottlenecks, and to have a traffic controller coordinate the traffic situation when there is a high density of transport vehicles, and minimising the number of vehicles parked along the district road DH604 during the construction period. • Mitigation measures for socio-economic impacts included the use of local labour where possible if they meet necessary work requirements, induction on local traditions and cultures to be conducted for new workers, BIWASE will work with local authorities to manage migrant workers involved in the construction work and ensure that mandatory regulations for workers from other localities coming to work in the construction site adhere to relevant laws and regulations and obey local safety rules, and BIWASE shall work with the local authorities to examine, remind, and strictly handle negative behaviours, violations to laws, and activities disturbing the security within provided accommodation.		• Automatic door for the waste bunker. ***CAP #11*; Low**

Mitigation measures during the operational phase

- Mitigation measures for air pollution are described for various processes, however, those relating to the existing composting plants and incinerators included:
    - All eight existing incinerators are equipped with their own flue gas treatment systems.
    - Composting plant:
        - installed polyethylene sheets to cover composting tanks for dust reduction and to facilitate decomposition.
        - Installed cyclone dust collectors to avoid dust release in the grinding area as part of the humus refinement process.
        - Installed bio-product spraying system to reduce odour generated during the composting process.
        - Installed gas collection pipe from the aerobic composting facility to the treatment system of the dual chamber incinerator with capacity of 4,200 kg/hour for treatment.
- Based on the 2022 EIA, all the wastewater discharged from the ongoing operational activities (approximately 1,042 m^3/day) are directed to the two existing WWTPs on the Site (the total amount of wastewater to be generated on the Site after the changes on site covered in the EIA, including the expansion to be funded by ADB, is expected to be 1,198 m^3/day); this includes leachate generated through the processes on the Site.
- Mitigation measures for generation of solid waste included segregation and collection of produced wastes into 120-240L plastic containers with lids and stored at designated areas for the respective types of wastes (ordinary or hazardous) before treatment on-site daily.
- Mitigation measures for noise and vibration pollution included anti-vibration cushions for machinery and equipment that produce high noise levels, sound-proof chambers for the stamping system, air compressor and power generator, ensuring that the base system of the machines is designed on a solid concrete foundation, and installation of a spring system at the anchoring points of machines to reduce vibration.
- Mitigation measures for thermal pollution included activities to control the heat dispersion inside the facilities and to ensure favourable microclimate conditions in worker's working environment. In particular, the following measures will be undertaken:
    - Facilities are equipped with heat-proof equipment including exhaust fans. Air-conditioners are installed for the office building;
    - Heat producing equipment, i.e. power generators, shall be isolated from other production units to reduce the heat dispersion and not to increase the temperature of all production facilities; and
    - More green trees will be planted surrounding the production facilities to improve the microclimate conditions and air quality.
- Mitigation measures for stormwater run-off included a stormwater retention tank which serves the entire Site and will collect stormwater run-off from the Site and hold it for 10 minutes before flowing into receiving waters so that sediments and hazardous dust can settle. On a regular basis, the sediments will be collected and treated in the solidification area before disposing in the landfill. At the waste storage areas and temporary waste storage facility, stormwater runoff is collected into a settling pond in the first 15 minutes before being directed to the centralized wastewater treatment system. Sludge from the settling pond will be dredged regularly and brought to the sludge treatment area.
- Mitigation measures for risks of spreading pathogens and odour issues for workers and local residents included:
    - Spray lime in the area before and after waste segregation, the entire area of the treatment plant shall be cleaned regularly;
    - Segregation activities are always completed within the day so it is less likely it will attract pathogenic insects, i.e., mosquitoes and flies, hence reducing the risk of spreading diseases;
    - Waste is kept indoors in the roofed facilities equipped with leachate collection systems;
    - A survey is conducted weekly with households surrounding the Site to update and introduce timely corrective actions if any impacts on the local peoples' lives are found.

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
			• Mitigation measures for impacts on groundwater included: - Ensure that groundwater abstraction permit is obtained and that the Site extracts and utilises drilled well water with the permitted amounts in the abstraction permit; - Drilled wells are located far away from waste treatment facilities; - Sanitary landfill cells are designed in alignment with technical requirements with pipelines that collect leaked water and transfer it to the centralised wastewater treatment system for treatment. The cell bed is equipped with a waterproof liner; - Wastewater from the composting plant, car washing, waste recycling, and incinerators will be collected for standardised treatment before released into the environment; - Collection equipment should be all maintained to avoid waste leakage that could contaminate underground water; and - Groundwater quality should be monitored regularly so that any pollution incidents could be found and fixed timely. In terms of design and operation, the WtE is not in an enclosed space and therefore there is no system of negative pressure applied to the waste reception area. The tipping area is a waste reception bunker that vehicles reverse up to and tip; waste is then loaded using a crane system. The combustion temperature is monitored in the control room and the input waste is monitored through the weighing station. Industry best practice includes: • Enclosed tipping hall kept under negative pressure; • Tipping only when the tipping hall door is closed; and • Automatic door for the waste bunker. <u>Environmental Quality Monitoring Program</u> The environmental quality monitoring program for the Site is described in the 2022 EIA and summarised below. All the construction phase monitoring locations (except for areas which also fall under operational phase) are within the Waste Treatment Complex. There is currently no monitoring taking place at sensitive receivers beyond the fence line. For the operational phase monitoring, all the monitoring locations are within the Waste Treatment Complex except for ambient air quality monitoring at the Site perimeter / households adjacent to site and other monitoring outside the Site such as groundwater quality and surface water quality. Noise monitoring is conducted within the Waste Treatment Complex under occupational environmental monitoring. *Construction phase* ***a) Air environment*** • Number of samples: 4 • Monitoring locations: o KK1: Area for installation of an incinerator with capacity of 8,400 kg/h o KK2: Area for the construction of the composting plant o KK3: Area for installation of an incinerator with capacity of 5,000 kg/h o KK4: Area for the renovation of a brick kiln into a sludge dryer • Indicators: dust, SO_2, NO_X, CO, moisture, temperature, noise • Frequency: every 3 months • Local standard: QCVN 02-2019/BYT, QCVN 03-2019/BYT ***b) Solid waste*** • Indicators: o Volume and composition of domestic solid waste, construction waste, and hazardous waste; o To check if waste collectors transfer solid waste to designated area in time and if any waste is falling out on the internal roads of the Site; • Frequency: monthly ***c) Emissions, wastewater, working environment, groundwater, surface water:*** based on the monitoring program for existing areas. The components not yet put in place will be no longer be implemented.		

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION

			Operation phase
			a) Incinerator emission monitoring
			Periodic monitoring:
			• Monitoring locations (at exhaust flue of all incinerators after the emission treatment system):
			  ○ KT1: 1,000 kg/hour incinerator for medical waste incinerator
			  ○ KT2: 100 kg/hour incinerator
			  ○ KT3: 200 kg/hour incinerator
			  ○ KT4: 5,000 kg/hour incinerator for hazardous waste
			  ○ KT5: 4,200 kg/hour incinerator (no. 1)
			  ○ KT6: 4,200 kg/hour incinerator (no. 2)
			  ○ KT7: 8,400 kg/hour incinerator (no. 1)
			  ○ KT8: 8,400 kg/hour incinerator (no. 2)
			• Indicators: Temperature, flow, total dust, O_2, SO_2, NO_x, CO, Hg, HCl, THC, Cd, Pb, total of other heavy metals, dioxins/furans
			• Frequency: every 3 months (once a year for dioxins and furans)
			• Local standards:
			  ○ QCVN 30:2012/ BTNMT (KT1, KT2, KT3, KT4, KT5, KT6, KT7, KT8, KT9)
			  ○ QCVN 61-MT:2016/ BTNMT (KT7, KT8)
			  ○ QCVN 02:2012/BTNMT (KT1, KT2, KT3)
			Automated monitoring:
			• Monitoring locations: exhaust flues of the 8 incinerators according to regulations
			• Indicators: flow, temperature, pressure, residual oxygen, total dust, SO_x NO_x , CO, HCl
			• Frequency: continuous
			• Local standards:
			  ○ QCVN 30:2012/ BTNMT (KT1, KT2, KT3, KT4, KT5, KT6, KT7, KT8, KT9)
			  ○ QCVN 61-MT:2016/ BTNMT (KT8, KT9)
			  ○ QCVN 02:2012/BTNMT (KT2, KT3)
			b) Pyrolysis emission monitoring
			• Monitoring location: exhaust flue of the pyrolysis furnace
			• Indicators**:** Temperature, flow, total dust, O_2, SO_2, NO_X, CO, Hg, HCl, THC, Cd, Pb.
			• Frequency: every 3 months
			• Local standard: QCVN 19:2009/BTNMT, Column B
			c) Brick kiln emission monitoring
			• Monitoring location: Exhaust of the tunnel kiln with capacity of 100,000 brick/day
			• Indicators**:** Temperature, flow, total dust, O_2, SO_2, NO_X, CO, HF
			• Frequency: every 3 months
			• Local standards: QCVN 19:2009/BTNMT, Column B
			d) Sludge dryer emission monitoring
			• Monitoring location: Exhaust flue of the sludge dryer
			• Indicators**:** Temperature, flow, total dust, O_2, SO_2, NO_X, CO
			• Frequency: every 3 months
			• Local standards: QCVN 19:2009/BTNMT, Column B
			e) Emission monitoring in the light tube crushing area
			• Monitoring location: Exhaust gas after the emission treatment system of the light tube crushing system
			• Indicator: Dust
			• Frequency: every 3 months
			• Local standards: QCVN 19:2009/BTNMT, Column B
			f) Wastewater monitoring		

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			Periodic monitoring:
			• Monitoring locations:
			  ○ NT1: at discharge point of the maturation ponds (which receive effluent from the centralized WWTP with capacity of 960 m^3/day) before release into the Ben Tuong stream
			  ○ NT2: effluent from the industrial WWTP with capacity of 250 m^3/day
			• Indicators: Flow, temperature, chromaticity, pH, BOD, COD, TSS, As, Hg, Pb, Cd, Cr^{3+}, Cr^{6+}, Cu, Zn, Ni, Mn, Fe, total cyanide, total phenol, total lubricating oil, sulphide, fluoride, ammonium, total N, total P, chloride, residual chlorine, total phytochemicals (organic chlorine), total phytochemicals (organic phosphorus), coliform
			• Frequency: every 3 months
			• Local standard: QCVN 40:2011/BTNMT, (A) , Kq = 0,9; Kf = 1,0
			
			Automated monitoring:
			• Monitoring locations:
			  ○ At the manholes collecting influent for the centralized WWTP of 960 m^3/day and the system of 250 m^3/day (indicator of influent quality).
			  ○ At the canal for monitoring effluent from the WWTPs with capacity of 960 m^3/day and 250 m^3/day
			• Indicators: Influent flow, effluent flow, pH, temperature, COD, TSS, chromaticity, ammonia
			• Monitoring frequency: continuous
			• Local standards: QCVN 40:2011/ BTNMT,(A)
			
			g) Sludge, ash, and slag monitoring
			Sludge monitoring
			• Monitoring location: storage tank of the WW treatment system
			• Indicators: pH, As, Ba, Ag, Cd, Pb, Co, Zn, Ni, Se, Hg, Cr^{6+}, CN^-, total oil, phenol, benzene.
			• Frequency: continuous
			• Local standard: QCVN 50:2013/BTNMT (eluate/leaching-based hazardous thresholds, C_{tc}[14])
			
			Ash and slag monitoring
			• Monitoring location: storage of ash and slag from the boiler which combusts a fuel mixture of 14 tons
			• Indicators: pH, Sb, As, Ba, Ag, Be, Cd, Pb, Co, Zn, Mo, Ni, Se, Ta, Hg, Cr, Va, total dioxin, total Furan.
			• Frequency: every 3 months.
			• Local standard: QCVN 07:2009/BTNMT (eluate/leaching, C_{tc})
			
			h) Solid waste and hazardous waste monitoring
			The Project Owner lists out the amount of waste generated from the operation of the Waste Treatment Complex every 3 months.
			
			j) Occupational environment monitoring
			• Monitoring locations: 25 locations at main work areas of the Site
			• Indicators: temperature, moisture, noise, dust, SO2, NO2, CO, CH3SH, H2S, NH3.
			• Frequency: every 6 months
			• Local standards:
			  ○ QCVN 02-2019/BYT
			  ○ QCVN 03-2019/BYT		

[14] C_{tc}: concentration of a solute (heavy metal) in a leaching test.

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION

			k) Surrounding air quality monitoring
			• Monitoring locations: 4 locations
			  ○ XQ1 – Waste Treatment Complex's gates
			  ○ XQ2 - Households to the East of the Waste Treatment Complex area
			  ○ XQ3 - Households to the South of the Waste Treatment Complex area
			  ○ XQ4 - Households to the West of the Waste Treatment Complex area
			• Indicators: Temperature, humidity, noise, dust, SO_2, NO_2, CO, CH_3SH, H_2S, NH_3.
			• Frequency: every 6 months
			• Local standards:
			  ○ QCVN 05:2013/BTNMT
			  ○ QCVN 06:2009/BTNMT
			
			l) Groundwater quality monitoring
			• Monitoring locations:
			  ○ NN1: Drilled well near the Waste Treatment Complex's dining hall.
			  ○ NN2: Drilled well near the waste vehicle weighing station.
			  ○ NN3: Drilled well near mechanic workshop
			  ○ NN4: Drilled well near the physiochemical treatment area (liquid waste treatment plant with capacity of 30 m3/day
			  ○ NN5: Drilled well of a household located 500m far from the Waste Treatment Complex's gates
			• Indicators: pH, hardness, $N\text{-}NO_2^-$, $N\text{-}NO_3^-$, total Fe, COD, Cl^-, F^-, Mn, Hg, Pb, Coliforms
			• Frequency: every 6 months
			• Local standard: QCVN 09-MT:2015/BTNMT
			
			m) Soil quality monitoring
			• Monitoring location:
			  ○ D1: Land plot near the sanitary landfill for hazardous waste
			  ○ D2: Land plot near the WWTP with capacity of 960 m3/day
			  ○ D3: Land plot near the sanitary landfills
			• Indicators: Zn, Pb, As, Cu, Cd, pH-H_2O, Cr, total N, total P, moisture
			• Frequency: every 6 months
			• Local standard: QCVN 03-MT:2015/BTNMT
			
			n) Surface water quality
			• Monitoring locations:
			  ○ NM1: Upstream of the discharging point to the Ben Tuong stream
			  ○ NM2: Downstream of the discharging point to the Ben Tuong stream, 30m far from the discharge point
			  ○ NM3: the Ben Tuong stream outfall to the Thi Tinh River
			• Indicators: pH, TSS, DO, BOD_5, COD, nitrite, nitrate, ammonia, chloride, total Fe, Phosphate, mineral oil, turbidity, coliform, Pb, F^- ,As, Cd, Cr^{3+}, Cr^{6+}, Cu, Zn, Ni, Hg, Mn, CN^-
			• Frequency: every 6 months
			• Local standard: QCVN 08-MT:2015/BTNMT
			
			o) Other monitoring
			Risk monitoring
			• The waste receiving area is checked regularly with good coordination of transport vehicles to minimize likelihood of incidents and traffic-related risks.
			• At the storge facilities: inspection and monitoring are carried out regularly to timely prevent or correct any issues related to chemical leakage or electrical fire and explosion.
			
			Workers' health monitoring
			• Health examination for workers within the Waste Treatment Complex area
			• Frequency: every 6 months
			• Cost estimate: VND 500,000,000/year
			
			Consultation with local community		

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
			• Questionnaires for dissemination to local community, inquiring about odour and insects • Frequency: weekly Based on the 2022 EIA, environmental protection reports are to be prepared once a year and sent to the competent management agency (DonRE) for review and monitoring. BIWASE provided the environmental monitoring report for operations at the Site in 2021 for review. Refer to item 5 below for further details. Other ongoing monitoring for overall risk, workers' health and consultation with the local community described in the 2022 EIA are expected to continue, including the Project. *Decommissioning / Post-operation Phase* In the 2022 EIA, it is also indicated that when a landfill is closed, the environmental monitoring program will increase the number of locations for air quality monitoring to evaluate its impacts. Other sources of waste are still monitored as mentioned above. • Locations: - KK1: Sanitary landfills - KK2: Safe burial facility for hazardous waste • Indicators: temperature, moisture, noise, wind speed, dust, SO_2, NO_2, CO, CH_3SH, H_2S, NH_3, CH_4 • Frequency: every 3 months in the first year and every 6 months in the next 4 years. If quality meets permitted levels in governing standards, sampling for monitoring can stop. • Local standards: - 3733/2002/QĐ-BYT - QCVN 05:2013/BTNMT - QCVN 06:2009/BTNMT - QCVN 26:2010/BTNMT <u>E&S Management and Implementation during the Construction Phase</u> Apart from general risk assessments and method statements for construction processes, no documentation relating to the E&S planning of the construction works was available. No E&S-related monitoring reports were available for the construction stage at the time of the ESDD site visit as the 2022 EIA was only approved on 9 June 2022. Poor working practices were observed during the site visit (refer to item 8a below for further details), and clear evidence in the variation in standards of safety between BIWASE's own staff and external contractors (drivers, construction workers, etc) was also observed. <u>E&S Management and Implementation during the Operational Phase</u> *Current Operations at the Waste Treatment Complex* **HSE Capacity** The following is noted in terms of HSE organisational capacity for the Site: • There is a Safety - Environment and Social Committee established on 1 April 2022, comprising nine members, two of which are specialised personnel (i.e. Ms. Ho Thi Thanh Thuy (Deputy Manager of HR and Administration) and Mr. Nguyen Van Vu; the list of committee members was provided for review); • Meeting minutes of a committee meeting dated 19 Apr 2022 discussed that the key responsibilities of the committee include compliance with EHS, OHS, fire prevention and firefighting regulations. The meeting also discussed allocation of tasks to committee members, including Ms Ho Thi Thanh Thuy to serve as liaison between corporate office and Site, Mr Le Quang Lap to be in charge of receipt of information from Ms. Thuy and implementation at Site as well as making recommendations should there be a shortage of personnel, and Mr Nguyen Van Vu to carry out duties under the direction of the board members and to provide suggestions and recommendations as necessary;		Ensure an adequate HSE team is put in place to meet local regulatory requirements, implement HSE management measures, and meet BIWASE's management systems / ISO requirements. This should cover both the ongoing construction and existing operations on site. Given that construction activities are ongoing and is likely to continue for at least 6 to 12 months, to effectively address the EHS issues at the construction site in a timely manner, it is recommended that appropriate EHS measures specific to construction are developed and implemented as soon as practically possible. The HSE team should also provide on-site HSE supervision during the construction phase of the Project to ensure that the external contractors are aligned to the same safety standards as BIWASE staff. ***CAP #12*; Medium**

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			• A document provided relating to OHS provisions for the Waste Treatment Complex describes roles and responsibilities of the Board of Directors, HR and other departments and employees, provisions for fire prevention and flowcharts for emergency response;
			• Ms. Ho Thi Thanh Thuy (Deputy Manager of HR and Administration is the main person in charge of OHS matters on Site, however, she is not a full-time OHS personnel and is in charge of OHS at the Site as well as other BIWASE sites; and
			• Ms. Nguyen Thi Hong Diem, Deputy Manager of HR and Administration, is in charge of environmental legal compliance.
			
			According to Article 36 of Decree 39/2016/NĐ-CP Detailed Provisions on Implementation of Articles of Laws on Occupational Safety and Sanitation, the Site needs a safety department and at least two full-time safety persons. Although the Company has established its Safety - Environment and Social Committee as required by this law, based on IBIS' observations on-site, the Site currently only has Ms. Ho Thi Thanh Thuy as the main OHS personnel, and she is not full-time on OHS matters and is also in charge of OHS at other BIWASE sites. Moreover, it is considered there is a disconnect between the written procedures included in the management systems and the day-to-day operations. The findings from both the monitoring and review of the management system point to a lack of capacity for the policies and procedures to be understood and implemented effectively, maintained and then updated as required. Whilst the personnel encountered by IBIS in the process of this ESDD were considered to be generally aware of the relevant topics, there is perhaps a lack of capacity to cover the full extent of the BIWASE's operations effectively and therefore EHS aspects appear to be somewhat under-resourced (there is currently one dedicated EHS personnel for a workforce of more than 1,000).
			
			E&S Training
			
			• The environmental monitoring records for the Site for 2021 included the training records conducted for 2021. These included:
			  ○ Working at height
			  ○ Working in confined spaces
			  ○ Use and storage of dangerous and toxic chemicals
			  ○ OHS-related training and procurement of PPE etc.
			  ○ Fire prevention and firefighting equipment
			  ○ Emergency response drills relating to chemical spills
			  ○ Dike break
			  ○ First aid training
			  ○ Food safety
			  ○ Industrial waste classification
			  ○ Covid-19 prevention
			  ○ Operation of equipment including the incinerator
			• The training schedule for the Site planned for 2022 includes:
			  ○ Annual fire prevention drills with the Ben Cat Police
			  ○ Internal fire prevention / firefighting equipment training
			  ○ Internal and external OHS training for relevant personnel
			  ○ Emergency response drills. e.g. chemical spills
			  ○ First aid training
			  ○ Industrial waste disposal related training
			  ○ Technical training in tree care
			  ○ ISO knowledge training for ISO 14001:2015 and ISO 45001:2018
			  ○ Other business-related skills		

3	**Consultation and Participation**				
	Carry out meaningful consultation with affected people and facilitate their	Environmental Safeguard, Policy Principle 5	The Site has been in operation at this current location since 2004. There is no documented grievance mechanism for stakeholders to access if they wish to raise complaints or concerns against the Site	Medium	While recognising that, in the context of Viet Nam, the local commune

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	informed participation. Ensure women's participation in consultation. Involve stakeholders, including affected people and concerned nongovernment organisations, early in the project preparation process and ensure that their views and concerns are made known to and understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to environmental assessment. Establish a grievance redress mechanism to receive and facilitate resolution of the affected people's concerns and grievances regarding the project's environmental performance.	Law on Environmental Protection (55/2014/QH13) Law on Water Resources No. 17/2012/QH13L aw on Complaints No. 02/2011/QH13 issued on November 11, 2011; Government's Decree No. 40/2019/ND-CP dated May 13, 2019 on amendments to decrees on guidelines for the Law on Environmental protection and providing for management of environmental monitoring services Decree 18/2015/ND-CP on environmental planning, strategic environmental assessment, environmental impact assessment and environmental protection plan Circular 27/2015/TT-BTNMT on strategic environmental assessment, environmental impact assessment and environmental protection plan Circular No. 25/2019/TT-BTNMT dated December 31, 2019 of MONRE on elaborating some articles of the It is noted that the new Law on Environmental Protection (72/2020/QH14) is effective from 1 January 2022 and its guiding Decree 08/2022/ND-CP and Circular 02/2022/BTNMT effective from 10 January 2022, however since the Project is initiated prior to the new Law on Environmental Protection is effective, therefore the legal requirements (specifically those related to the EIA) applicable to the Project are the regulations issued prior to 2022.	operations. No records of recorded grievances were available for review, and there were reportedly no outstanding significant grievances. The Company maintains close relations with the local government (commune People's Committees, hereinafter "PC"). The PC Vice-Chairman at Chanh Phu Hoa reported that the Company has been diligent in addressing any grievances raised by the local community or PC. The PC has phone numbers of Company management to be able to raise grievances at any time. The common practice in Viet Nam is that when there is an issue, the complainant will inform the PC, if not the Company directly. The communities in the surrounding areas of the Waste Treatment Complex are reportedly engaged and will raise any concern, as it occurs. Complaints received at the Waste Treatment Complex have been mostly related to odour from the landfill area, occurring at the beginning of the rainy season. On other occasions there were also complaints regarding vehicles dropping waste en-route to the Site. There have, reportedly, been no complaints regarding surface water/groundwater contamination and air pollution from the incinerators. BIWASE sends out weekly questionnaires to households living around the Site area to ask for their opinions about odour and insects, for example, flies, and problems arising from the collection, treatment, recycling activities of waste at the Site. The questionnaires are given to the households in Quarter1A, Quarter1B, Quarter3, Quarter4, Chanh Phu Social Protection Center, Ben Cat Town and Ben Tuong Hamlet in Bau Bang District. Based on questionnaire responses collected from January 2019 to May 2021, there has been positive feedback particularly around pests and odour issues. The results of environmental monitoring conducted as committed in the EIA are reportedly disclosed to the public/surrounding communities through publication on the notice board outside the Complex (examples of the notification for Q1 and Q2 2022 environmental monitoring results were provided for review; they appeared to cover wastewater monitoring, working environment atmosphere monitoring, and emissions monitoring at the respective incinerators, including incinerator no. 8 proposed to be funded by ADB). Incident prevention and response plans for wastewater-related incidents, emission-related incidents and fire and explosion incidents have been developed in the 2022 EIA. These are described under item 8 of this table. These incidents are relevant to the local communities as well, as such incidents may impact on the local communities. However, these plans have not been communicated to the local communities to-date. During the Project planning and implementation, according to the 2022 EIA, BIWASE conducted consultation via three methods: (i) Sent an official letter no. 937/CPN.MT-XLCT dated 23 August 2021 to the PC of Chanh Phu Hoa ward of Ben Cat town in Binh Duong province explaining the main impacts of the Project on the environment and measures to minimise the impacts from the Project; (ii) Worked with Chanh Phu Hoa ward PC to organise a consultation meeting with the local community on 1 October 2021 about the Project titled "Constructing Additional Solid Waste Treatment And Recycling Units and Changing Purposes of Incinerators and a Brick Kiln of the South Binh Duong Solid Waste Treatment Complex with Capacity Upgraded from 6,216.8 tonnes/day to 6,608.38 tonnes/day". Participants included representatives of BIWASE, People's Committee of Chanh Phu Hoa ward, consulting firm which prepared the EIA report, and local residents; and (iii) Consulted 10 experts and scientists from the Hanoi University of Natural Resources and Environment on the content of the EIA report. Through the consultation, the PC of Chanh Phu Hoa ward, local communities and the experts and scientists raised their concerns and comments on the Project that were then incorporated in the EIA report. IBIS met with the PC during the ESDD site visit, who confirmed that they have been consulted as part of the EIA process and had no objections. Some key concerns/comments raised during the consultation are presented as follows: <u>Comments/concerns from local authorities / local People's Committee</u> • The People's Committee of Chanh Phu Hoa ward agreed with the impacts on local socio-economic conditions and community health identified in the report and environmental impact mitigation measures presented; • BIWASE should ensure proper and full implementation of mitigation measures identified in the EIA report to minimise negative impacts of the Project on the natural environment, socio-economic, and community health;		would typically facilitate community grievance management, during both the construction phase of the Project and the operational phase of the Waste Treatment Complex, a formal external communications mechanism (grievance redress mechanism) should be established by the Project (or BIWASE) for management of grievances from external stakeholders, including regulatory authorities and surrounding communities. Any feedback or grievances shall be logged. Refer to previous CAP item under this topic. . BIWASE shall ensure that incident prevention and response plans for wastewater-related incidents, emission-related incidents and fire and explosion incidents are communicated to affected external stakeholders. This is typically done upon approval of the EIA (the 2022 EIA has been approved on 9 June 2022). This shall be undertaken together with item 4 (Information Disclosure) below.

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			• BIWASE should ensure that waste is properly treated according to the provisions of the law on environmental protection, without affecting the surrounding environment; • BIWASE would take responsibility in the form of compensation for any damages or remedy in response to problems caused by the Project's activities; • Sought further explanation from BIWASE on why incinerators are being replaced / built rather than upgrading the existing ones; • Sought further explanation from BIWASE on the treatment processes for medical and hazardous waste; • recommended that BIWASE uses new technology to avoid changes within a short time to ensure minimum environmental impacts; and • BIWASE is requested to strictly comply with the commitments in the EIA report and to take legal responsibility if environmental problems occur. <u>Comments/concerns from the local community</u> • The local community felt that it is good that new combustion technology will be used in place of landfilling, however, they highlighted the need to pay attention to the air quality to avoid dust and smoke impacts on the surrounding areas when upgrading the incinerator; • BIWASE should comply with its commitment in the EIA report and minimise odour generation; and • BIWASE should provide records for the households in the area to keep track of environmental issues and how they are handled. <u>Comments/concerns from the experts and scientists</u> • BIWASE to supplement some missing documents related to the Project / update certain regulations referred to in the EIA report; • BIWASE to include in the EIA that the Project is aligned with Binh Duong provincial master plan on solid waste management and treatment by 2030 as per Decision no. 1942/QĐ-UBND dated August 12, 2013; • Figures on environmental monitoring are sufficient, however, it is suggested to keep 2021 data only and remove data for 2017-2020; • BIWASE to provide additional assessment of the current status of wastewater treatment systems and their receiving capacity upon the Waste Treatment Complex's expansion; • BIWASE to clearly state the components already in operation, the additional conversion and construction activities. • BIWASE to clearly list out the existing environmental protection works and the additional ones; • BIWASE to present the existing fire prevention and fighting plans, handling, prevention and response to environmental incidents and any new incidents with the expansion; • BIWASE to carefully evaluate impacts on community psychology and health, as the Project will greatly affect people's lives, livelihoods, and psychology when developed; • BIWASE to clarify information on the current status of existing operations, works relating to changing function/technology, new construction works, and ensure consistency throughout the report; • Besides assessment of environmental impacts of the Project during operation phase, BIWASE to also include assessment of the impacts of the Project during the construction of the expansion and changes in capacity and technology, etc. • BIWASE to explain the changes in emissions with the changed functions and combustion rates in the EIA report and ensure that proposed mitigation measures are relevant to the assessed impacts;		

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			• The combustion of waste containing plastic will generate odour and harmful gases such as dioxins and furans. Therefore, it is necessary to specifically assess the impact of the incinerators on both the environment and human health and propose appropriate mitigation measures; • BIWASE to explain how the lab incident occurred and if it was reasonable to treat wastewater from the laboratory together with wastewater from other sources; • Evaluation of wastewater properties should be based on the most recent pre-treatment wastewater monitoring values (in 2021) to match the scale of wastewater properties during the operation period, as the figures before 2018 are less relevant given the Site has expanded capacities several times; and • BIWASE to consistently apply the local standards within the EIA report (including to ensure that suitable coefficients are used to calculate receiving waters and wastewater volume of the Project). BIWASE recorded the comments / concerns of the local authorities, People's Committee and the local community, and fully accepted the opinions of experts and made the necessary edits in the final EIA report.		
4	**Information Disclosure**				
	Disclose a draft environmental assessment (including the EMP) in a timely manner, before project appraisal, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. Disclose the final environmental assessment, and its updates if any, to affected people and other stakeholders.	Environmental Safeguard, Policy Principle 6 Law on Environmental Protection (55/2014/QH13) Decree 18/2015/ND-CP on environmental planning, strategic environmental assessment, environmental impact assessment and environmental protection plan Decree 40/2019/ND-CP guiding the implementation of some articles of the Law on Environmental Protection Circular 27/2015/TT-BTNMT on strategic environmental assessment, environmental impact assessment and environmental protection plan Circular No. 25/2019/TT-BTNMT dated December 31, 2019 of MONRE on elaborating some articles of the Government's Decree No. 40/2019/ND-CP dated May 13, 2019 on amendments to decrees on guidelines for the Law on Environmental protection and providing for management of environmental monitoring services.	As noted above in item 3 (Consultation and Participation), the 2022 EIA was sent / presented to the People's Committee of Chanh Phu Hoa ward, the local communities and experts and scientists for review and comment. The 2022 EIA has been approved on 9 June 2022. The Chanh Phu Hoa Ward received the document on 19 June 2022 and this has now been disclosed via this channel.	No issues	None required.
5	**Monitoring & Reporting**				
	Implement the EMP and monitor its effectiveness. Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports.	Environmental Safeguard, Policy Principle 7 Law on Environmental Protection (55/2014/QH13) Law on Occupational Safety and Health No. 84/2015/QH13 issued on June 25, 2015 Decree No. 38/2015/ND-CP dated April 24, 2015 of the Government on management of waste and discarded materials. Circular 43/2015/TT-BTNMT on environmental monitoring	Environmental protection reports are to be prepared once a year and sent to the competent management agency (DoNRE) for review and monitoring. BIWASE provided the environmental monitoring report for operations at the Site in 2021 for review. The monitoring report included results for the Site's monitoring program for wastewater, waste sludge, air emissions, soil quality, surface water quality, groundwater, solid waste and occupational environment monitoring. The indicators mostly meet allowable standards, with minor exceedances in wastewater discharge and surface water quality. All the monitoring is conducted by third party with the exception of the automated Continuous Emission Monitoring System (CEMS) for two incinerators stacks. The Waste Treatment Complex has installed CEMS three incinerators including the 8,400 kg/h incinerator proposed to be funded by ADB. The remaining incinerators will have the CEMS installed progressively in accordance with local regulations. The following parameters are monitored by the CEMS: temperature, dust, flow, pressure, SO_2, CO, NOx and O_2. Data is transmitted to the control station under Binh Duong Provincial DoNRE for review and monitoring. Binh Duong DONRE has certified data transmission of the CEMS to the	No issues	

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
		Decree 44/2016/NĐ-CP on industrial hygiene monitoring Law on Water Resources (17/2012/QH13) Decree 39/2016/NĐ-CP guiding the implementation of the Law on Occupational Health and Safety Circular No. 36/2015/TT-BTNMT dated June 30, 2015 of MONRE on management of hazardous wastes; Circular No. 22/2010/TT-BXD dated December 03, 2010 of MOC on labor safety in work construction. It is noted that the new Law On Environmental Protection (72/2020/QH14) is effective from 1 January 2022 and its guiding Decree 08/2022/ND-CP and Circular 02/2022/BTNMT effective from 10 January 2022, however since the Project is initiated prior to the new Law on Environmental Protection is effective, therefore the legal requirements (specifically those related to the EIA) applicable to the Project are the regulations issued prior to 2022.	central station for the two incinerators based on Letter no. 193/STNMT-CCBVMT dated January 15, 2021 and Letter no. 500/STNMT-CCBVMT dated February 02, 2021 (based on information obtained from the 2022 EIA). In case the monitoring parameters exceed the emission thresholds, BIWASE has a cloud monitoring software on smartphones which will issue a warning when the exhaust gas is about to exceed the thresholds; the operator will then assess the entire operation of the incinerator to determine the causes and mitigation measures. Ambient air quality monitoring at households around the Site showed that all parameters met the allowable ambient air quality standards (refer to item 7c below for further details). No monitoring reports have been prepared by BIWASE for the construction phase of the Project as the 2022 EIA had not been approved at the time of the ESDD site visit, however, as the works are within the boundary of an active site it is considered that the impacts are to some extent captured within the existing monitoring regime. There are no significant construction impacts which IBIS would consider requiring a monitoring plan beyond the one that is currently in place at the time of the site visit, although the Site is now required to conduct monitoring against the monitoring plan in the approved 2022 EIA.		
6	**Biodiversity Conservation and Sustainable Natural Resources Management**				
	Do not implement project activities in areas of critical habitats, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognised endangered or critically endangered species, and (iii) any lesser impacts are mitigated. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. In an area of natural habitats, there must be no significant conversion or degradation, unless (i) alternatives are not available, (ii) the overall benefits from the project substantially outweigh the environmental costs, and (iii) any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development, and management of renewable natural resources.	Environmental Safeguard, Policy Principle 8 Law on Environmental Protection (55/2014/QH13) Law on Water Resources No. 17/2012/QH13 Law on Biodiversity No. 20/2008/QH12	The Project lies within the existing Waste Treatment Complex which has been in operation since 2004. Based on a review of historical aerial imagery of the Site and its surroundings and observations made during the visit on 9 June 2022, the Site is surrounded by mainly agricultural land. The cemetery west of the Site was developed between 2003 and 2010 (no Google Earth historical imagery available between 2003 and 2010). No critical habitats or legally protected areas are identified within the Site area or in its vicinity. This observation concurs with the findings in the 2022 EIA. Based on the 2022 EIA, the Site is surrounded by agricultural land and there is limited ecological value within the Site; therefore, the Project activities do not cause significant adverse impacts on biological resources and ecosystems. The vegetation in Chanh Phu Hoa mainly consists of agricultural and industrial trees namely rubber, cashew, peanut, casava, fruit trees, etc., with a rubber forest to the north of the Site. IBIS conducted a review on Integrated Biodiversity Assessment Tool (IBAT)[15] and the Site is located in an area with no recognised areas of high biodiversity value. The nearest Protected Areas are as follows: • Cat Tien National Park which is classified as a UNESCO biosphere Reserve Zone is approximately 40 km east of the Site (the Nam Cat Tien International Bird Area[16] is located within the park); and • Khu Bảo Tồn Thiên Nhiên Nature Reserve – approximately 30 km east of the Site. A Reputational Risk Review (RRR) has been conducted, which included a review of publicly available biodiversity-related information in relation to protected habitats (*Annex C*).	No Issue	None required.
7	**Pollution Prevention and Abatement**				

[15] https://www.ibat-alliance.org/country_profiles/VNM
[16] http://datazone.birdlife.org/site/factsheet/12056

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
a	*Pollution Prevention, Resource Conservation* Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimise or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage. Avoid the use of hazardous materials subject to international bans or phaseouts.	Environmental Safeguard, Policy Principle 9 Law on Environmental Protection (55/2014/QH13) Law on Water Resources (17/2012/QH13) Law on Chemicals (06/2007/QH12) Irrigation Law (08/2017/QH14) Decree 38/2015/ND-CP on waste management Circular 36/2015/TT-BTNMT on hazardous waste management Decree 201/2013/ND-CP guiding the implementation of the Law on Water Resources, including the issuance of groundwater extraction, surface water extraction and wastewater discharge permits	In the 2022 EIA, a set of environmental mitigation measures were proposed in the form of an EMP and an environmental quality monitoring program for implementation during the pre-construction, construction and operational phases of the Project, as elaborated in item 2 above. Specific environmental aspects further discussed below are: • Wastewater management; • Air emission management; • Noise management; • Waste management; • Hazardous material management; • Pesticide use and management; and • Greenhouse gas emissions.	No issues	Refer to item 2 (Environmental Planning and Management) above, and details in the sub-sections below.
b	*Wastewater Management*	Environmental Safeguard, Policy Principle 9 Vietnamese technical regulations on discharge quality (QCVNs) QCVN 40:2011/BTNMT Vietnamese technical regulations on industrial waste QCVN 40:2011/BTNMT Vietnamese technical regulations on leachate from landfill	*Current wastewater management at the Site* All the wastewater discharged from the ongoing operational activities (approximately 1,042 m^3/day) on-site is collected to an existing centralised WWTP at the Site with capacity of 960 m^3/day and another existing WWTP with capacity of 250 m^3/day. *During the construction phase of the Project* The mitigation measures for wastewater management during the construction phase are included in the 2022 EIA, described in item 2 above. In general, the wastewater generated from the construction phase is negligible compared to the overall wastewater generation on-site and is treated by the existing two WWTPs on-site. Wastewater from construction and equipment installation activities is mainly domestic wastewater from domestic and sanitary use on the construction area and wastewater from cleaning of vehicles that transport materials, equipment, etc. The total amount of wastewater discharged during the period of construction and equipment installation in the Waste Treatment Complex is approximately 1,082 m^3/day. *During the operational phase of the Project* The total amount of wastewater to be generated on the Site including the expansion to be funded by ADB is expected to be 1,198 m^3/day. During the visit, the two WWTPs were reported to be working well and the monitoring results for 2021 indicated that the treated effluent discharge was within the regulatory limits.	No Issues	None required.
c	*Air Emission Management*	Environmental Safeguard, Policy Principle 9	*During the construction phase of the Project* The mitigation measures for air pollution are included in the 2022 EIA, described in item 2 above. At the time of the visit, civil works had already been completed. As such there were no high dust levels observed. No significant combustion sources or signs of on-site waste burning were observed. Based on IBIS' observations and information provided by BIWASE, no workers' accommodation facilities are located on-site.	High	BIWASE should develop and implement a process to establish and understand the health impacts in the community due to the Waste Treatment Complex (if any). This could include a review of the content of the questionnaire sent to the communities near the Waste Treatment Complex to add items to capture any impacts on public health, and based on the responses to its questionnaires and/or statistics

			During the operational phase of the Project The mitigation measures for air pollution are included in the 2022 EIA, described in item 2 above. <u>Odour</u> For a Waste Treatment Complex like this, odour can arise from the composting plants, sanitary landfills, WWTPs, and the solid waste storage facility especially for domestic waste storage as they contain a high organic content. Based on the 2022 EIA, BIWASE adopts the following measures for odour control: • Regular use of microbial products for odour control on the landfill; • Landfill cells are immediately covered with tarpaulin upon being fully filled; • Appropriate planning of treatment processes to avoid overlapping and minimise the duration of waste storage in receival areas; and • Rubber trees are grown around the Site area, which helps to disperse odours. Based on the regular questionnaires conducted by BIWASE with the local community in the area over the period of January 2019 to May 2021, the findings are as follows: • 100% of survey participants commented that odour occurrence was infrequent, with most of them indicating that there is no odour or only very rarely or occasionally; • In 2021, survey participants commented that there is not even occasional odour, with some sharing that the odour issue is much improved compared to the past; and • In general, survey participants' opinion against odour and pest issues are positive. Mild odour was noticeable at some points around the perimeter of the Site during the visit, which is expected for a waste site, and is not considered to be of major concern. Samples of the responses to the community questionnaires from households living around the Site have been provided by BIWASE (see *Annex F: Samples of Responses to the Community Questionnaires*). <u>Point Source Air Emissions</u> Based on observations made during the Site visit, air emission point sources from the existing operations of the Site include the incinerator stacks and the use of back-up diesel generators. Table 1 in *Annex G: Air Quality Monitoring* provides a comparison of the EU Directive 2010/75/EU, Tokyo Standard/Japanese Air Pollution Control Act/Act on Special Measures against Dioxins, US EPA and the applicable Vietnamese standards for air emissions from WtE facilities (the latter are the maximum permissible emissions that can be permitted in Viet Nam). All the incinerators on Site are equipped with a system to treat flue gas prior to emission through a stack (including cyclone and wet scrubber), however, the effectiveness of these systems may vary depending on the design of the system. A comparison of the Project's incinerator's emissions monitoring data for the new 8,400 kg/hour incinerator for February to May 2021 and the first five months of 2022 against international and Vietnamese national air quality standards for waste management facilities (Table 1 in Annex G) showed that there were some exceedances of the EU Standard (with its corresponding time average values) and the local regulations (spot values are used), as indicated by the red font in Table 1. When compared to the EU standards, it is noted that the EU standards are generally more stringent than the Vietnamese standards even though some parameters are not comparable (i.e. the EU uses time average standards while Vietnam standards are for spot samples rather than time averages). Based on available information, there does not appear to be exceedance of the Japanese Standard (with its corresponding time average values, where available). Given that the Project includes an 8,400 kg/hour incinerator and there are various sensitive receivers around the Site, cumulative air quality impacts should be considered especially since there are other emission sources within and around the Site (i.e. other incinerators within the Waste Treatment Complex, crematorium of the adjacent cemetery, emissions from a nearby plastics recycling plant). An Air Quality Impact Assessment (Ricardon AEA, 2022) has been carried out based on the design of the incinerator unit stack height (36m) and by applying the permissible limits under the Japanese regulations for municipal waste incinerators. The modelling shows that the impacts from the new incinerator fall within the		from public health facilities, track the situation moving forward. ***CAP #13***; **Medium**

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			air quality standard or guideline (AQSG) for all parameters, with the exception of NOx, which shows a contribution of 9.4% and 29% of the relevant annual mean and maximum 1 hour mean AQSG respectively), based on the available information. It should be noted that this modelling has been carried out using best available information, however, inputs to the model are limited due to insufficient baseline air quality data (ideally a 6 to 12-month baseline is needed, to account for seasonality and provide a representative dataset) and worst case scenario emissions assumptions based on the Japanese emissions limits, in lieu of real time data from the Site for Incinerator No.8 (the incinerator under the Project). Subsequent to its initial impact assessment, ADB's Air Quality Consultant conducted an updated air quality impact assessment which was provided to IBIS for review. The air quality impact of the proposed facility (i.e. the WtE facility) was evaluated against the requirements of ADB's Safeguarding Policy Statement, the WBG EHS Guidelines, and determined that emissions from the facility are likely to comply with the Japanese waste incineration emissions standard under normal operating conditions. Further air quality monitoring data for four monitoring locations from Binh Duong Provincial Department of Natural Resources and Environment (DoNRE) recorded between June 2021 and June 2022 was also used in the evaluation to assess the likelihood of the airshed within which the Site is located being classified as degraded[17]. Considering measurement and model information in the EIA report with information from international sources using satellite measurements, and the data at the Binh Duong province air quality monitoring sites, it was concluded that the airshed should not be considered degraded for nitrogen dioxide. For clarity: • For a facility located in a non-degraded airshed: modelled concentration should be no more than 25% of the national standard or international guideline such as the WHO Air Quality Guidelines; and • For a facility located in a degraded airshed: modelled concentration should be no more than "a fraction" of the national standard or international guideline such as the WHO Air Quality Guidelines. It was therefore further concluded that, in order to comply with ADB policy, the contribution from the waste to energy facility should be reduced to less than 25% of the air quality guidelines for nitrogen dioxide. In order to achieve this, it the limit on emissions from the proposed facility should be reduced from 513 mg/Nm^3 to 400 mg/Nm^3. While still less demanding than other international standards, such as those applied in the European Union, this would reduce the forecasted impact of the proposed facility to comply with the criteria set in the WBG EHS Guideline. This could potentially be achieved without using more expensive techniques such as Selective Catalytic Reduction. Based on the model results, maximum concentrations of nitrogen dioxide would occur in the near vicinity of the WtE facility (approximately 500m from the WtE facility). Considering the distance from the WtE facility to the site perimeter and the land uses surrounding the Site described in Section 2.2.2, some of the plantations and residential premises east of the site could fall within / close to this zone. All other pollutants are not forecasted to have a significant effect on air quality. Provided emissions from the WtE facility comply with the standards set in the Japanese standard for waste incineration, there could be a potentially significant impact resulting from emissions of oxides of nitrogen. This reflects the relatively low stack height, and the relatively high limit for oxides of nitrogen set in the Japanese standard. ADB's air quality consultant also conducted a review of BIWASE's "Proposed Waste-to-Energy Plant Design Improvement Report"; however, the information underpinning this report was not reviewed. Based on the critique ADB's air quality consultant considers the design of the WtE plant to be 'unconventional' with notable separation between combustion chamber and boiler (long ductwork) possibly due to subsequent retrofitting of the boiler. As a result, the effect of making design changes and retrofitting equipment on process operation and emissions is less clear than it would be for a plant of more conventional design. ADB's air quality consultant review also commented on the proposed changes to the flue gas treatment system. The proposed approach of retrofitting a bag filter with upstream injection of sodium bicarbonate and activated carbon would be considered as "Best Available Techniques" (BAT) in Europe, and should result in		Given the identification of the various sensitive receivers around the Site (houses around the perimeter, orphanage / elderly home to the northeast), BIWASE shall incorporate the recommendations from the ADB's air quality consultant updated air quality assessment and review of BIWASE's "Proposed Waste-to-Energy Plant Design Improvement Report" accordingly. ***CAP #14***; **High**

[17] An airshed should be considered as degraded if nationally legislated air quality standards or WHO Air Quality Guidelines are exceeded significantly.

<table>
<tr><th>REF</th><th>ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS</th><th>LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE</th><th>COMMENTARY/ FINDINGS</th><th>RISK RANKING</th><th>CORRECTIVE ACTION</th></tr>
<tr><td></td><td></td><td></td><td>significantly improved abatement of particulate matter, sulphur dioxide, hydrogen chloride, heavy metals including mercury and dioxins and furans. If properly configured and operated, this approach should allow compliance with EU and Japanese emission limits shown in the report for the parameters above (assuming the raw flue gas is broadly typical composition for a MSW fired incinerator). The review also noted other factors that may affect the emissions including:
• Proposed removal of the existing scrubber/venturi - Ricardo suggested to retain all or part of this (e.g. the adsorption tower) as a final polishing stage to minimise emissions;
• The choice of sodium bicarbonate as the reagent for acid gas neutralisation - sodium bicarbonate is effective, but is more sensitive to flue gas temperature than hydrated lime (i.e. effective over a narrower temperature window), and can also present greater challenges in managing the residues, resulting in increased leaching compared to lime.
• Proposed changes to the combustion air flow are significant and could have knock-on impacts, but it is unclear if this has been considered in any detail. This includes changes to temperature profile in the combustion chamber and boiler entry, which could in turn affect the effectiveness of the SNCR process and NOx emissions and impact the integrity of the boiler/combustion chamber, and changes in flue gas velocity through the system could result in multiple impacts. Ricardo suggested that Computational Fluid Dynamics (CFD) modelling be carried out to understand the impact of the proposed changes.
<u>Ambient Air Quality</u>
Based on ambient air quality monitoring at four locations around the Site for 2021, all parameters met the WHO ambient air quality standards (refer to Table 2 in Annex G for the comparison)..</td><td></td><td></td></tr>
<tr><td>d</td><td>Noise Management</td><td>Environmental Safeguard, Policy Principle 9
QCVN 26/2010/BTNMT on National technical regulations on Noise</td><td>Current noise management at the Site
Ambient noise monitoring is being conducted for both the construction of the new facilities and the operation of the existing facilities, including four locations for the construction, four locations surrounding the Site and 23 locations for occupational environment around the Site. Relevant noise mitigation measures have been identified in the 2022 EIA. Based on the findings during the Site visit, the operations of the Site are not audible from the surrounding area (including the cemetery and the households visited). Noise impacts from the operations seem to be well buffered by the treeline screening around the Site perimeter (and the distances to receptors).
See Item 2 above for details on noise management and monitoring and item 8a below for details on occupational noise exposure.

During the construction phase of the Project
The mitigation measures for noise pollution are included in the 2022 EIA, described in item 2 above.
According to QCVN 26/2010/BTNMT on National Technical Regulations on Noise, noise limits during the day and the night are shown in the table below for different receptor types:

<table>
<tr><th rowspan="2">Receptor</th><th colspan="2">One Hour L_{Aeq}(dBA)</th></tr>
<tr><th>Day time 06:00-21:00hrs</th><th>Night time 21:00-06:00hrs</th></tr>
<tr><td>Educational facilities, health, facilities, libraries, pagoda, church</td><td>55</td><td>45</td></tr>
<tr><td>Residential, housing, administrative agencies, hotels, commercial areas</td><td>75</td><td>55</td></tr>
</table>
Note that the WBG EHS General Guidelines requirements are:
<table>
<tr><th rowspan="2">Receptor</th><th colspan="2">One Hour L_{Aeq}(dBA)</th></tr>
<tr><th>Day time</th><th>Night time</th></tr>
</table></td><td>Low</td><td>None required.</td></tr>
</table>

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
			<table><tr><td></td><td>07:00-22:00hrs</td><td>22:00-07:00hrs</td></tr><tr><td>Residential, institutional, educational</td><td>55</td><td>45</td></tr><tr><td>Industrial, commercial</td><td>70</td><td>70</td></tr></table> Key differences between the Vietnamese and WBG EHS General Guideline requirements are the limits at residential and housing locations during the daytime and the hour ranges. *During the operational phase of the Project* The mitigation measures for noise pollution are included in the 2022 EIA, described in item 2 above. Please see item 8a below for occupational noise exposure.		
e	*Waste Management*	Environmental Safeguard, Policy Principle 9 Decree No. 38/2015/ND-CP dated April 24, 2015 of the Government on management of waste and discarded materials. Decree No. 40/2019/ND-CP dated May 13, 2019 of the Government on guiding and supplementing some provisions in Decrees guiding implementation of LEP (2014). Circular No. 36/2015/TT-BTNMT dated June 30, 2015 of MoNRE on management of hazardous wastes; QCVN 50:2013/BTNMT on National Technical Regulation on Hazardous Thresholds for Sludges from Water Treatment Process	*Current waste management at the Site* Based on the 2022 EIA, solid waste generated on-site during the construction phase mainly includes waste building materials, i.e. concrete, metal scrap, stone, soil, rubble, waste packaging from cement and sand bags, etc., domestic solid waste from workers' daily activities, and solid waste from ongoing operations. The amounts of different types are wastes are estimated as follows (based on the 2022 EIA): • Domestic solid waste from 840 workers including 30 construction workers - about 546 kg/day; mainly organic waste (food waste, packaging, paper, etc.); • Construction waste – about 11 tons for the entire construction period; includes packaging of building materials, damaged formwork, scrap iron, rock, rubble, etc.; • Industrial waste from ongoing operation - 1,273 tpd; the solid waste generated from the ongoing activities of the Site will be collected and returned to the recycling and landfilling processes in the sanitary landfill or combusted in the waste incinerators; and • Hazardous waste during the construction period - 11.7 kg/day ▪ From construction activities: about 1.7 kg/day; includes used grease and oil contaminated materials from the operation and maintenance activities, transport vehicles, construction equipment, paint containers, paint residue, paint brushes; and ▪ From ongoing operations – about 10 kg/day; includes waste lubricant oil and used rags from the mechanic workshop etc. The domestic and non-hazardous industrial waste is segregated and collected into 120-240L plastic containers with lids and located in areas with fencing walls to provide adequate containment . All containers will be brought to the appropriate treatment area in the Waste Treatment Complex at the end of each day. Hazardous waste discharged from the construction period is collected into 60L containers with lids. Hazardous solid waste generated from the ongoing production activities will be segregated, collected, and contained in 120-240L containers with lids designated for hazardous waste. Waste containers will be collected and gathered in the area designated for hazardous waste in the Waste Treatment Complex at the end of each day for further segregation and treatment. BIWASE lists out the amount of waste generated from the operation of the Site once every three months. According to Decree 38/2015/ND-CP on management of waste and discarded materials, and Circular No. 36/2015/TT-BTNMT dated 30 June 2015 of MoNRE on management of hazardous wastes, waste generators of hazardous waste with a volume greater than 600 kg per year are required to register with DoNRE. BIWASE is registered as such.	No Issues	None required.
F	Hazardous Materials	Environmental Safeguard, Policy Principle 9 Law on Chemicals (06/2007/QH12) Law on Occupational Health and Safety (84/2015/QH13)	During the visit, no significant volumes of hazardous materials or significant volume of chemicals were observed to be used on-site during the construction and operational phase of the Project. Hazardous materials / chemicals would fall largely into the following three categories: • Diesel for operating incinerators and generators; • Additives for the composting process; and • Chemicals used in the water treatment process, such as polyaluminum chloride (PAC) and chlorine.	No Issues	None Required

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		Decree 39/2016/NĐ-CP guiding the implementation of the Law on Occupational Health and Safety Decree 113/2017/ND-CP guiding the implementation of the Law on Chemicals Circular 32/2017/TT-BCT guiding the implementation of the Law on Chemicals and Decree 113/2017/ND-CP QCVN 05:2020/BCT National Technical Regulations on storage, handling, use and transport of hazardous chemicals			
g	*Pesticide Use and Management*	Environmental Safeguard, Policy Principle 9 Law on Chemicals (06/2007/QH12) Decree 113/2017/ND-CP guiding the implementation of the Law on Chemicals Circular 32/2017/TT-BCT guiding the implementation of the Law on Chemicals and Decree 113/2017/ND-CP	No documented information on pesticide use and management has been identified in the 2022 EIA, nor provided by BIWASE. It is understood that BIWASE uses permethrin (in WHO's approved list) for mosquito control and glue trap for rats and flies on-site. Based on information in relation to the Project, this is not considered to be a significant risk.	Low	None required.
h	*Greenhouse Gas Emissions*	Environmental Safeguard, Policy Principle 9 Circular 47/2011/TTLT-BCT-BTNMT	No documented information on GHG emissions has been identified in the 2022 EIA, nor provided by BIWASE. Processes such as composting and incineration will generate GHG, and with the capacity of the Project, it might constitute a significant amount. However incineration rather than landfill of waste reduces the GHG emissions as combustion gases such as CO_2 have a significantly lower global warming potential than methane generated from waste decomposition in a landfill.	Low	BIWASE to quantify the direct emissions from the Project within the physical Project boundary and indirect emissions associated with the off-site production of power used by the Project (if any). The quantification and monitoring of GHG emissions shall be conducted annually in accordance with internationally recognized methodologies. In addition, BIWASE shall evaluate technically and financially feasible and cost-effective options to reduce or offset project-related GHG emissions during project design and operation and pursue appropriate options. ***CAP #15*; Low**
8	**Health and Safety**				
a	*Worker Health & Safety* Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Under the Social Protection Strategy, it recommends the project proponent to provide safe and healthy working environment for its employees as well as its contractors/ subcontractors and comply with the national labour laws and take measures to comply with the core labour standards. The ADB SPS mandate that the identified OHS issues	Environmental Safeguard, Policy Principle 10 Social Protection Strategy	Despite BIWASE's ISO management system certifications, relevant practices do not seem to be adopted on-site. For example, there were no documents relating to 'Permit-to-Work' or health and safety planning for the ongoing construction areas for the Project. Unsafe work practices were observed on-site. Details for the construction and operational phases of the Project described below. <u>Construction of the Project</u> *Observations on-site* • No fall barriers around the waste reception bunkers in the new compost plant (an estimated 5 to 7 m drop); • Workers were observed without fall protection measures when working on formwork and concrete works for the foundations of the waste picking line of the new compost plant;	High	BIWASE should review and update the overall general and occupational H&S management at the Site. Some of the more immediate aspects to be reviewed and updated include: • Ensure permit-to-work system is in place and documented adequately, including hot work and confined spaces; • Health and safety planning for the ongoing construction areas at the WtE and composting plant;

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
	must be identified, assessed, and addressed in an EIA for proposed projects.		• Hot work being undertaken on level 2 of the new WtE heat exchanger building, with sparks falling to the area below – no permit-to-work was noted to be in place. Similarly, no fall barriers on level 2 or warning signs around the work area were observed; • Construction workers in inappropriate footwear at the WtE facility construction area (in flip flops); and • Traffic management around the landfill site and compost plant were noted to require improvement. During the visit, IBIS observed the ongoing construction works for the new composting plant and WtE facility, and there was no evidence that the contractor management system was implemented to manage external contractors working on the Site. Clear evidence in the variation in standards of safety between BIWASE's own staff and external contractors (drivers, construction workers, etc) was also observed. <u>Existing operations at the Site</u> *Observations on-site* • The noise levels at the composting areas arising from moving trucks and the movement of the trommel screens are significant; • Standard operating procedures including relevant safety measures for the compost plant and incinerators were reviewed. Risk assessments in Vietnamese for the various operations on the Site were provided for review; and • Workers at the waste picking line of the existing compost plants did not have appropriate PPE (some personnel noted to be wearing flip flops and with no hearing protection). • BIWASE stated that the noise levels are checked annually, however, based on the short time of the visit to this area, it would suggest that there are elevated noise levels with the potential for longer-term negative impacts. *H&S Training* • According to information provided by BIWASE, there are two HR Officers at the Site to manage training. • H&S training records conducted for 2021and H&S training schedule planned for 2022 are described in item 2 above. *Medical Surveillance and Occupational H&S Medical Examination* Based on the 2022 EIA, health examination for workers within the Waste Treatment Complex are conducted every 6 months with a cost estimate of VND 500,000,000/year. Based on a review of BIWASE's annual report to the Department of Labour, Invalids and Social Affairs and the health check results, no occupational diseases have been detected to-date. *Incidents and Accidents* The accidents log for 2022 was viewed by IBIS on-site. Two of the accidents involved employees' hands being stuck in moving machinery parts resulting in hand injuries and/or crushed fingers, two of the accidents were traffic-related which occurred during the commute to/from the Site resulting in injuries to the head, shoulder and thigh and a bone fracture, and one accident involved maintenance staff member falling from a ladder due to a broken ladder latch while replacing light bulbs resulting in head injuries. The injured personnel were all taken to My Phuoc General Hospital where first aid was provided, and they were seen by doctors. These accidents have been reported to the Labour Department in line with regulatory requirements. No other records were available, and near miss records are not maintained. According to site personnel there have been no reportable accidents since 2004 (other than those noted above) or for the construction of the Project (to-date). Given that there are about 1,000 workers on Site, there should be more robust monitoring of leading safety indicators or near misses.		• Designation of appropriately qualified personnel to oversee workplace (construction) H&S and improve any unsafe conditions; • Selection, use, training and maintenance of PPE, including those required to be used during an emergency situation; and • Include a code of conduct for contractors for construction activities, and set out roles and responsibilities for the HSE team on site to monitor contractors and primary suppliers to ensure they are aligned to the Company ESMS and policies. ***CAP #16*; High** BIWASE shall perform incidents/accidents recording and reporting, including reportable incidents, first aid cases and near misses. ***CAP #17*; Medium**

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
			Emergency Preparedness and Response The 2022 EIA describes measures for incident response for incidents related to wastewater, incinerators, and domestic solid waste (including operation of composting area, leachate collection system, fires or floods in landfills and collapse of landfill embankment). There is an emergency response plan which includes a template for minuting incident investigation. However, no minutes were available for review and the template appears not to have been used. Based on the annual training schedule, annual fire prevention drills are conducted with the Ben Cat Police and there is internal fire prevention / firefighting equipment training. First aid boxes were present at various locations on-site, however, they were few in number. There are 19 first aiders, trained in 2022 by Medic General Hospital. These first aiders reportedly cover all workplaces and work shifts. The number of first aiders meets regulatory requirements for approximately 1,000 workers. There is a clinic on-site, managed by Ms.Thuy, who is also one of the 19 trained first aiders. The site has signed a 24-hour medical support contract with My Phuoc Hospital, which expires on 23 March 2023. The Site has a fire-fighting team of 87 staff, trained by the local fire brigade. The Site has a fire-fighting plan, as required by law. Annual drills are performed with participation of the local fire brigade, based on the scenarios in the fire-fighting plan. The Site also has an emergency rescue plan, as required by law. The latest inspection by the local fire brigade was in December 2021, where no findings were raised. Fire alarm and fire-fighting systems and equipment on-site were installed based on the fire safety design approved by the local fire brigade. During the visit, firefighting equipment appeared to be in good condition. Based on the 2022 EIA, the safety management team at the Site will work with suppliers and other relevant agencies to organize drills twice a year. Under the ISO 45001 certification, the Site has other emergency procedures for: • Chemical spill response; • Accident; • Biogas leak; and • Collapse of an embankment. Site management reported that annual drills were performed for these emergency procedures. BIWASE reported no previous fires or significant emergency incidents historically at the Site.		
B	*Community Health & Safety* Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimise, adverse impacts and risks to the health and safety of local communities.	Environmental Safeguard, Policy Principle 10 Decree No. 102/2017/ND-CP on registration of security measures	Based on the 2022 EIA, impacts on community health and safety are assessed such as impacts from leachate, vectors and pathogens, spread of waste, and odour. The 2022 EIA indicates that BIWASE will prepare a schedule of transport for all vehicles to avoid working during rush hours, not to exacerbate the traffic congestion as well as to pick the route with minimal impacts to the local residential areas. The access and egress to the Site is via a purpose-built main roadway. Based on observations during the visit to the Site, no evidence of traffic congestion was observed and the route to and from the Site is serviced by main highways to its east and west. Local stakeholders commented on the benefits of the upgrade in transport infrastructure brought about by the Site and had no significant complaints. Reportedly the Site conducts regular maintenance on the road for dropped loads and leakages from vehicles. Incident prevention and response plans for wastewater-related incidents, emission-related incidents and fire and explosion incidents have been developed in the 2022 EIA. These are described under item 8 of this table. These incidents are relevant to the local communities as well, as such incidents may impact on the local communities. However, these plans have not been communicated to the local communities (refer to item 3 above for details). Every week, BIWASE sends questionnaires to the households living around the project area to ask for their opinions about odour and insects, for example, flies, and problems arising from the collection, treatment, recycling activities of waste in the Site. The questionnaires are given to the households in Quarter 1A,	No Issues	

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
			Quarter 1B, Quarter 3, Quarter 4, Chanh Phu Social Protection Center, Ben Cat Town and Ben Tuong Hamlet in Bau Bang District. Based on questionnaire responses collected from January 2019 to May 2021, there has been positive feedback particularly around pests and odour issues (see details in item #7c of this table).		
9	**Physical Cultural Resources**				
	Conserve physical cultural resources and avoid destroying or damaging them by using field-based surveys that employ qualified and experienced experts during environmental assessment. Provide for the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.	Environmental Safeguard, Policy Principle 11 Law on Cultural Heritages (28/2001/QH10) and Amendment (32/2009/QH12)	The Site is situated within an agricultural area. No physical cultural structures were identified within the Project area. According to Binh Duong Department of cultural, sport and tourism[18], there are 16 national cultural and history areas within Binh Duong Province, none of which are found within close proximity to the Site. Based on a review on readily available historical aerial imagery going back to 2003 (prior to development of the Site), there did not appear to be any obvious features of tangible cultural heritage. At this stage, impact on physical cultural resources is not considered to be an issue. According to BIWASE, no physical cultural features were identified during the initial land clearance for the Waste Treatment Complex. Given that the Project is situated within the existing footprint of the Waste Treatment Complex, and all earth and foundation works for the construction has been completed, the risk of encountering any physical cultural features is now low. It may be prudent to include a chance find procedure in the ESMS related to the construction of any new facilities in future.	Low	Include a chance find procedure in the ESMS for future construction activities by BIWASE.

[18] https://eng.binhduong.gov.vn/dautuphattrien/Lists/Tourism/TongQuat.aspx?PageIndex=0&CategoryId=Historical%20-%20Culture%20Monuments

5.2 ADB SPS INVOLUNTARY RESETTLEMENT SAFEGUARDS

Table 5-2 ADB SPS Involuntary Resettlement Safeguards

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
1	**Screening**				
	Screen the project early on to identify past, present, and future involuntary resettlement impacts and risks. Determine the scope of resettlement planning through a survey and/or census of displaced persons, including a gender analysis, specifically related to resettlement impacts and risks	Involuntary Resettlement, Policy Principle 1 Under the Law on Public Investment No. 49/2014/QH13, project owners must prepare the pre-feasibility and feasibility study reports that mention about assessing on environment, social and finance issues. Under item 4.c of Article 40 of Land Law 2013, the area and location of the land to be recovered for the implementation of socio-economic development projects should be assessed in the district annual land use plans.	The Project is situated within the existing footprint of the Waste Treatment Complex which was developed in 2004. Based on interviews with the Vice-Chair of the People's Committee of Chanh Phu Hoa ward who was also previously involved in the land acquisition process, land acquisition for the entire Waste Treatment Complex was conducted by the government of Binh Duong province at the same time in 2003 (prior to the development of the Site). At that time, the Site comprised mostly rubber plantations and no dwellings; as such there was no physical displacement. About 20 to 30 households were affected and there are reportedly no outstanding land disputes. In addition, none of the affected households were identified as ethnic minorities. IBIS also interviewed three previous landowners who owned land at the location of the Site before the development of the Waste Treatment Complex and currently live near / along the perimeter of the Site. • A previous landowner living on the eastern side of the Site mentioned that there were more than 40 households east of the Site which have been there since before the development of the Waste Treatment Complex. Compensation was paid for the land lost at a rate of 1.5 times market rate. His home is adjacent to the eastern boundary of the Site and he mentioned occasional emission impacts during the rainy season, however, he was not sure of the source as there was another waste management (plastics recycling) facility east of the Site. Odour increases in the wet season. • A previous landowner living on the south eastern side of the Site indicated that he was a willing seller of his land and was very happy with the land acquisition process. He received two times of the market rate for his land. He has no complaints on the Site except for occasional odour issues in the wet season, however, these are short lived. He also complimented the Waste Treatment Complex for having upgraded the local roads which resulted in reduced traffic jams. Prior to the Site his home was only accessible by an unpaved road. • A previous landowner who owned rubber plantations within the Site footprint and currently owns a house and cafe at the end of the access road to the Site explained that his compensation for the land was 1.5 times the market rate, and he has re-invested the money and currently runs a small café for drivers which is a source of income. He informed that he had no issues with the Site expect for some teething issues (e.g. transport noise, dust etc.) when it was first developed. At this stage, no further action is considered to be warranted under this Safeguard.	No Issues	None required

5.3 ADB SPS Indigenous Peoples Safeguards

Table 5-3 ADB SPS Indigenous Peoples Safeguards

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
1	**Screening**				
	Indigenous Peoples Safeguards Requirement is not triggered for the Project development.	ADB Indigenous Peoples Safeguards, Policy Principle 1	Based on IBIS' review of Project documents, information provided by BIWASE and findings during the Site visit in June 2022, no indigenous peoples (IPs) are located on-site or are known to be present in the surrounding area near the Site. The area surrounding the Site is mainly occupied by Kinh, who are the mainstream ethnic group in Viet Nam. No IPs were known to have been affected by the Site. Discussions with the Communes Peoples Committee Vice Chair confirmed this as the status. At this stage, no further action is considered to be warranted under this Safeguard.	No issues	None required.

5.4 Labour and Working Conditions

Table 5-4 Labour and Working Conditions

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
1	**Child Labour**				
	Appropriate steps should be taken to ensure that procurement of goods and services, contractors, subcontractors, and consultants, comply with the country's labour legislation as well as with the Core Labour Standards. The Core Labour Standards consist of (a) freedom of association and the effective recognition of the right to collective bargaining, (b) the abolition of all forms of forced or compulsory labour, (c) effective abolition of child labour, and (d) elimination of discrimination in respect of employment and occupation.	ADB's Social Protection Strategy (2001)	Viet Nam has ratified all nine ILO Fundamental Conventions, including the ILO conventions on Minimum Age Convention, 1973 (No. 138) and Worst Forms of Child Labour Convention, 1999 (No. 182). The Company does not have a specific policy on child labour and a Human Rights Policy. As a general practice, the Company does not employ any person below the age of eighteen years at the workplace. Identification documents would be reviewed as part of the employment process. Overall, given the nature of the operations on-site (i.e. use of construction machinery and vehicles), the risk of the use of child labour is considered to be low. Based on observations conducted during the Site visit, no signs or evidence of child labour or young workers were identified by IBIS.	Low	Despite the relatively low risk of child labour, it is recommended that BIWASE develops a policy around prohibition of child labour, including management of its contractors to ensure that child labour is prevented in its supply chain. Refer also to *Section 4.1* and item 5 below.
2	**Forced Labour**				
	Appropriate steps should be taken to ensure that procurement of goods and services, contractors, subcontractors, and consultants, comply with the country's labour legislation as well as with the Core Labour Standards. The Core Labour Standards consist of (a) freedom of association and the effective recognition of the right to collective bargaining, (b) the abolition of all forms of forced or compulsory labour, (c) effective abolition of child labour, and (d) elimination of discrimination in respect of employment and occupation.	Social Protection Strategy (2001)	Viet Nam has ratified all nine ILO Fundamental Conventions, including the ILO conventions on Forced Labour, 1930 (No. 29) and Abolition of Forced Labour Convention, 1957 (No. 105). The Company does not have a specific Policy on Forced of Compulsory Labour as well as a Human Rights Policy. However, given the nature of the business the likelihood of forced labour is considered to be low. Based on observations conducted during the Site visit, no signs or evidence of forced labour were identified by IBIS.	Low	Despite the relatively low risk of forced labour, it is recommended that BIWASE develops a policy around prohibition of forced labour, including management of its contractors to ensure that forced labour is prevented in its supply chain. Refer also to *Section 4.1* and item 5 below.
3	**Payment of Wages**				
	Appropriate steps should be taken to ensure that procurement of goods and services, contractors, subcontractors, and consultants, comply with the country's labour legislation as well as with the Core Labour Standards. The Core Labour Standards consist of (a) freedom of association and the effective recognition of the right to collective bargaining, (b) the abolition of all forms of forced or compulsory labour, (c) effective abolition of child labour, and (d) elimination of discrimination in	Social Protection Strategy (2001)	Based on a sample contract provided, the monthly salary is clearly indicated along with budgetary relief allowance in line with local regulatory requirements. Based on IBIS' opportunistic interviews with workers during the Site visit, it appeared that the workers are paid in accordance with their contracts and generally seem satisfied with their employment. There have reportedly been no grievances logged to the HR department related to wages.	No issues	None required.

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
	respect of employment and occupation.				
4	**Working Hours and Overtime**				
	Appropriate steps should be taken to ensure that procurement of goods and services, contractors, subcontractors, and consultants, comply with the country's labour legislation as well as with the Core Labour Standards. The Core Labour Standards consist of (a) freedom of association and the effective recognition of the right to collective bargaining, (b) the abolition of all forms of forced or compulsory labour, (c) effective abolition of child labour, and (d) elimination of discrimination in respect of employment and occupation.	Social Protection Strategy (2001)	Based on a sample contract provided, the following points are noted: Working hours and annual leave are not clearly indicated in the contract. There does not appear to be provisions regarding overtime work. The Company had indicated that it adheres to local labour law with regards to working hours. The Company also tracks working hours of employees (by the line managers at each work area) and calculates overtime accordingly by HR team. A sample of a monthly attendance sheet at the Waste Treatment Complex was provided for review.	Low	It is suggested for BIWASE to improve their way of recording the timesheet as it is not easily interrogated at this moment. ***CAP #18*; Low**
5	**Non-Discrimination and Equal Opportunity**				
	Appropriate steps should be taken to ensure that procurement of goods and services, contractors, subcontractors, and consultants, comply with the country's labour legislation as well as with the Core Labour Standards. The Core Labour Standards consist of (a) freedom of association and the effective recognition of the right to collective bargaining, (b) the abolition of all forms of forced or compulsory labour, (c) effective abolition of child labour, and (d) elimination of discrimination in respect of employment and occupation.	Social Protection Strategy (2001)	In its internal labour regulations, BIWASE committed to compliance with legal regulations, including the Labour Code. However, the Company has no specific policy on Equal Opportunity and Non-Discrimination as well as a Human Rights Policy which are applicable to all subsidiaries (including the Waste Treatment Branch). The Company has a recruitment procedure that indicates that recruitment is based on merit only. Given the nature of the business, the risk of human right violation is considered to be low.	Low	Despite the relatively low risk of human rights violation, it is recommended that BIWASE develops policies around equal opportunity and non-discrimination and human rights covering all its subsidiaries including the Waste Treatment Branch.
6	**Freedom of Association**				
	Appropriate steps should be taken to ensure that procurement of goods and services, contractors, subcontractors, and consultants, comply with the country's labour legislation as well as with the Core Labour Standards. The Core Labour Standards consist of (a) freedom of association and the effective recognition of the right to collective bargaining, (b) the abolition of all forms of forced or compulsory labour, (c) effective abolition of child labour, and (d) elimination of discrimination in respect of employment and occupation.	Social Protection Strategy (2001)	Viet Nam has ratified all nine ILO Fundamental Conventions, including the ILO convention on Right to Organise and Collective Bargaining, 1949 (No. 98). BIWASE has a Trade Union and all employees are welcomed to join. There is also a Collective Bargain Agreement that contains provisions that are not stipulated by legal regulations (such as reward and bonus).	No Issues	None required.

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
7	**Worker Accommodation**				
	Appropriate steps should be taken to ensure that procurement of goods and services, contractors, subcontractors, and consultants, comply with the country's labour legislation as well as with the Core Labour Standards. The Core Labour Standards consist of (a) freedom of association and the effective recognition of the right to collective bargaining, (b) the abolition of all forms of forced or compulsory labour, (c) effective abolition of child labour, and (d) elimination of discrimination in respect of employment and occupation.	Social Protection Strategy (2001)	As the workers on Site including construction workers are from the local population, no worker accommodation/housing is provided on Site, and none was identified during the Site visit.	No Issues	None required.
8	**Supply Chain Management**				
	Appropriate steps should be taken to ensure that procurement of goods and services, contractors, subcontractors, and consultants, comply with the country's labour legislation as well as with the Core Labour Standards. The Core Labour Standards consist of (a) freedom of association and the effective recognition of the right to collective bargaining, (b) the abolition of all forms of forced or compulsory labour, (c) effective abolition of child labour, and (d) elimination of discrimination in respect of employment and occupation.	Social Protection Strategy (2001)	The Company has a Contractor Management Procedure which provides that the contractors must comply with legal regulations including those regarding labour management, however, there is no explicit provision for the contractors or waste suppliers to comply with labour management regulations.	Medium	BIWASE to ensure that its Contractor Management Procedure includes provision for their contractors and waste suppliers to comply with labour management regulations, and to ensure that checks/audits are put in place to ensure its implementation. *BIWASE is requested to make available to all drivers entering the site:* • *A flash card of site rules detailing the expectations with regards to use of PPE and other safety provisions;* • *The card will also detail general safety notifications related to vehicular safety in the waste management sector including lists of key hazards and mitigation measures e.g.* o *No climbing onto or into vehicles;* o *Use of high visibility uniforms when working alongside or at the reach of a refuse collection vehicles;* o *Instructions for safely loading and unloading of roll on/off containers;* o *Statistics relating to most common injuries or accidents in the waste sector involving vehicles, driver or loaders;*

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
					○ *Tips on 'defensive driving';* • *These flash cards will also include details of labour rights for workers under Vietnamese Law including working hours, driving house, breaks, pay, holiday entitlement, sick pay, workers organisations etc.; and* • *Contact details for the relevant government departments regarding labour laws should also be included.* ***CAP #19*; Medium**
9	**Gender**				
	The policy recognises the need to improve the status of women and to promote their potential role in development practices. The strategy of the policy is based on the consideration of social justice and gender equity that investment in women is vital to achieving economic efficiency and growth. The key elements of the policy relates to the following: *Gender Sensitivity*: Focuses on how the operations of the project proponent will affect women and men, and to take into account women's needs and perspectives in planning its operations. *Gender Analysis*: Focuses on the systematic assessment of the impact of a project on men and women, and on the economic and social relationship between them. *Gender Planning*: Focuses on specific strategies that aim to bring about equal opportunities for men and women. *Gender Mainstreaming*: Focuses on the consideration of gender issues in all aspects of the project proponent's operations, accompanied by efforts to encourage women's participation in the decision-making process in development activities. *Agenda Setting*: Focuses on the formulation of strategies to reduce gender disparities and in developing plans and targets for women's and girls' education,	Gender and Development Policy (1998).	In terms of Site facilities, separate changing rooms and washrooms are available for male and female employees at the office areas and the processing areas. Based on the workforce breakdown provided, the proportion of female employees within the Waste Treatment Complex workforce has been around 14%. Recruitment is mainly driven by the skills required. It is noted that the jobs at the facilities in the Waste Treatment Complex are considered heavy and hazardous as such may be less desirable conditions for some potential workers. Most of the female employees work as administration potions rather than at the production lines.	No issues	None required.

REF	ADB'S SAFEGUARD PRINCIPLES/ REQUIREMENTS	LOCAL REGULATORY REQUIREMENTS AND ADB SAFEGUARD REFERENCE	COMMENTARY/ FINDINGS	RISK RANKING	CORRECTIVE ACTION
	health, legal rights, employment, and income-earning opportunities.				

5.5 Project Categorisation

Following the ADB's SPS Categorisation System and based on the gap analysis conducted above, the proposed categorisation of the Project is presented in *Table 5-5* below.

Table 5-5 Proposed Project Categorisation

SAFEGUARD REQUIREMENT	CATEGORY	RATIONALE
Environment	B	Based on the information provided (including from the locally completed EIA) the impact level is considered to be generally site-specific, few, if any of them are irreversible if properly managed. Thus, the proposed environmental categorisation of the Project is considered to be B. As the Project is the expansion of an existing waste management facility the direct impacts can be considered a minor increase to environmental impacts and the inherent risks are addressed in the existing pollution prevention infrastructure the site has in place (e.g. perimeter screening). Were this Project a greenfield development including the full extent of the waste treatment technologies on-site (e.g. landfill, industrial waste treatment, incineration, etc) it may possibly have been categorised as Category A, however, the pre-existence of the site and its environmental protection and monitoring regime lends itself to a B categorisation.
Involuntary Resettlement	C	The proposed project categorisation of the Project is C, as no land acquisition was directly required for the Project. All ADB-investment works are located within the existing footprint of the Site.
Indigenous Peoples	C	The proposed categorisation of the Project is C, as there are no known Indigenous Peoples in the Project area and no known impacts on Indigenous Peoples from the Project. This information was confirmed with the Communes Peoples Committee Vice Chair during the Site visit.

5.6 EVALUATION OF THE PROJECT WITH RESPECT TO ADB'S ENERGY POLICY

The following section evaluated the Project against the ADB Energy Policy Supporting Low-Carbon Transition in Asia and the Pacific[19], specifically in relation to paragraph 71 which addresses ADB policy with regards to supporting WtE investment for heat or electricity generation.

ADB's policy states that it *"will support will support projects that promote a circular economy and consider holistically the order of priorities—first reducing waste generation, then exploiting the options for reusing and recycling materials, then using waste to recover energy or usable materials, followed by sanitary engineered landfilling as the last option. ADB support for waste-to-energy investments will promote sustainable livelihood opportunities for the poorest of the poor working along the waste value chain and at landfills. The potential environmental and social impacts of waste-to-energy investments will be managed by using the best internationally available technologies in the design and operation of such projects in accordance with international conventions."*

The aforementioned order of priorities is interpreted as the application of the waste hierarchy (*Figure 5-1*) and the generally accepted definition of circular economy has been visualised by the Ellen McArthur Foundation as shown in the below in *Figure 5-2*.

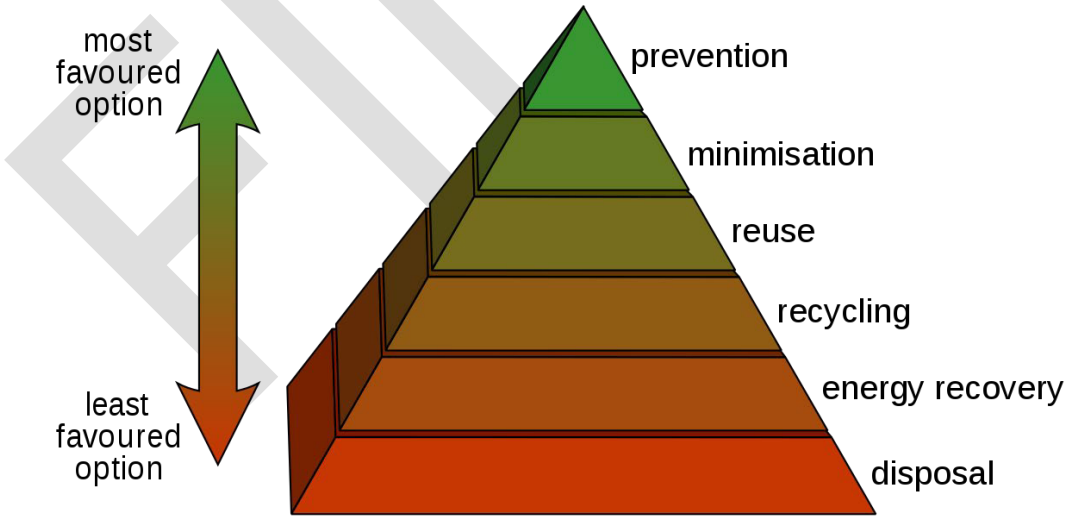

Figure 5-1 Waste Hierarchy

[19] https://www.adb.org/sites/default/files/institutional-document/737086/energy-policy-r-paper.pdf

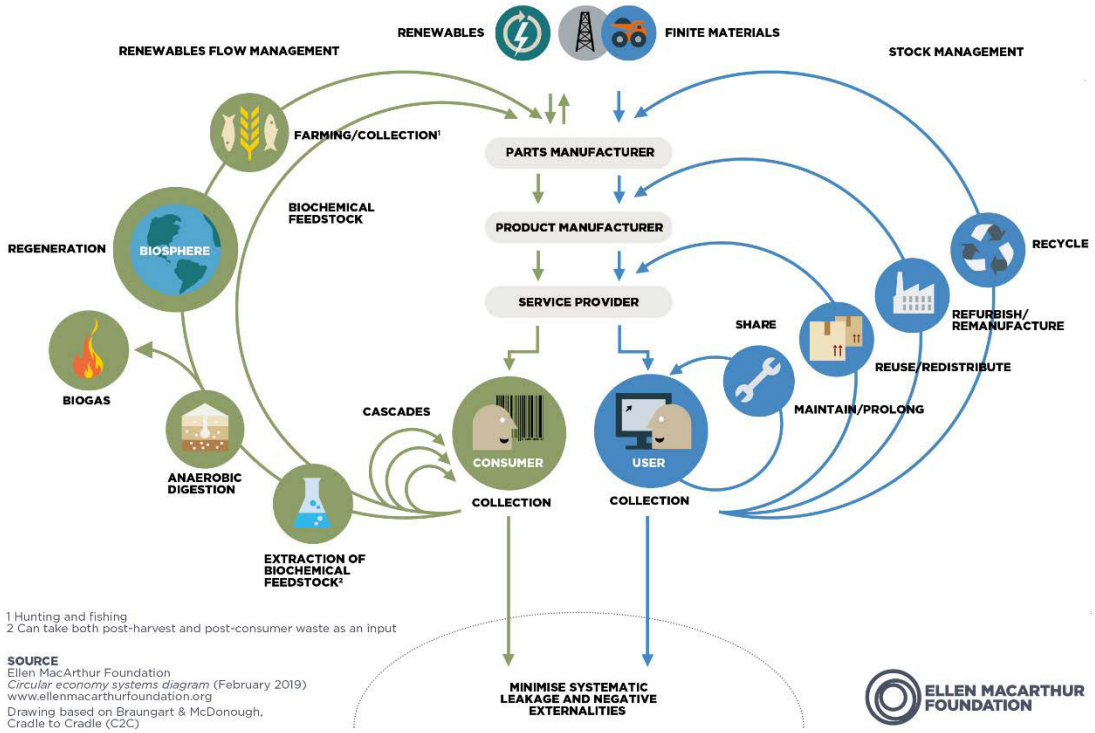

Figure 5-2 Circular Economy[20]

Considering the Project and the application of the waste hierarchy:

Waste Reduction: the Project and BIWASE is not engaged in any waste reduction initiatives. It is a waste collection and disposal business and is not engaged in the promotion of upstream waste reduction.

Waste Reuse: BIWASE utilises the waste residues from its WtE plants in the production of ceramic bricks and tiles that are sold commercially into the construction industry. Fly ash and bottom ash from the incinerators is used in the process, thereby upcycling it and preventing it from being sent to landfill.

Waste Recycling: it is understood that the feedstock from for the WtE process will primarily be from commercial and industrial waste sources in order to maintain a stable calorific value of the waste mix. However, the input waste to the composting process also feeds the WtE. The process removes the organic fraction which is sent for composting on-site. The waste mix is then directed via a material recycling facility which includes technology for removing any metals in the waste for recycling. Manual picking is undertaken on-site along a conveyor belt picking line with any high value

[20] https://ellenmacarthurfoundation.org/circular-economy-diagram

recyclables targeted at this point. Reportedly, the rejects from the composting process (plastics removed during produce screening and refinement) are directed to the WtE as a high calorific value feedstock.

Energy Recovery: The main aim of the ADB financing for this Project is to support the installation of energy recovery equipment on the WtE plant.

Disposal: The Project may use the on-site landfill for the disposal of some process residues, however, as noted above, the key residue from the process is ash which is directed to the on-site brick manufacturing facility to be used as a raw material in that process.

With respect to the concept of circular economy the Project possibly falls into the category of leakage as the WtE facility is an energy recovery operation. However, the aforementioned utilisation of process ash in the brickmaking prevents further leakage of resource through use in a recycled product. Couple this with the composting and recycling picking lines that are in place then there is a clear attempt to direct resource back into the closed loop that the circular economy ethos is built upon.

6 CONCLUSION AND CORRECTIVE ACTION PLAN

This section summarises the proposed list of corrective actions that should be undertaken by BIWASE to address the gaps against the Applicable Standards identified in Section 3.2. The proposed CAPs at corporate and facility levels are provided in *Table 6-1* and *Table 6-2* respectively, along with proposed timelines and specific action items.

NOTE: Draft proposed timings are provided and subject to further discussion.

6.1 CORRECTIVE ACTION PLAN AT CORPORATE LEVEL

Table 6-1 Corrective Action Plan at Corporate Level

CA #	REFERENCE	FINDING	CORRECTIVE ACTION	RISK	DELIVERABLE	RESPONSIBILITY	PROPOSED TIMEFRAME (CONDITION PRECEDENT (CP)/ CONDITION SUBSEQUENT (CS))	INDICATIVE BUDGET / RESOURCES
ESMS and Policies – Environmental & Social Policies								
1.	ADB Safeguard Policy Statement, V. Safeguard Policy Statement	Whilst the management system is well documented and certified, based on IBIS' assessment, the management systems are not fully implemented on-site as would be expected in line with these certifications.	At the corporate level, BIWASE shall review the implementation of its QSHE management system and EHS resources allocated to the implementation at the Site, and identify areas of improvement to ensure adequate translation of the corporate ESMS to the facility level. Specific actions include, at the minimum: • Review the need for additional EHS resources at the Site level given that there is currently only one dedicated EHS person for a workforce of approximately 1,000; • Conduct refresher training for personnel involved in EHS matters at the Site level; • Conduct a root cause analysis and further investigation into the issues identified in this ESDD including implementation of mitigation and management measures required; and • Conduct more frequent EHS performance reviews/audits on Site and recommend improvement / follow-up actions as necessary (e.g., every 6 months until performance level improves). IBIS would recommend that BIWASE embarks upon a safety diagnostic exercise with an external consultant. The work would involve engaging senior leadership within the Company in a series of workshops that highlight unsafe work practices on the site and demonstrate the risks and potential consequences of the behaviours of BIWASE staff and/or contractors. Engagement would be with C-Suite / Senior Management and its purpose would be to reinforce safety culture at the Site with a view to empowering the EHS functions to intervene more readily where unsafe acts are witnessed. Safety transformation requires the visibility of Senior Management at the Site to drive home the message about what is unacceptable in terms of safety behaviours on site.	Medium	1. Documentation / observations of improved site conditions or adequate implementation of ESMS on Site (i.e., result of safety diagnostic exercise). 2. Results of EHS performance audit on site. 3. Evidence of EHS refresher training for EHS personnel at the site (i.e., training program, number of participants, training materials, photos). 4. Result of EHS resource review including EHS organizational structure at corporate and site level showing tasks and competencies of each EHS position at the corporate and site levels.	BIWASE Corporate	1. Prior to to commercial operation. 2. CS Results provided to ADB every 6 months as part of the E&S performance reporting until performance improves. E&S performance reporting may be reduced to annual basis once E&S performance improvement is noted. 3. CS 3 months after disbursement 4. CS 3 months after disbursement	Management time
2.	ADB Safeguard Policy Statement, V. Safeguard Policy Statement	The Company-level HR policies do not explicitly prohibit child labour and forced labour, however it is noted that the recruitment policy set out the qualification and the minimum age (18 years old) for the candidates, which rules out the potential of child labour and forced labour.	Despite the relatively low risk of child or forced labour, it is recommended that BIWASE develops policies around prohibition of child or forced labour and human rights, including management of its contractors to ensure that child and forced labour is prevented in its supply chain.	Medium	Policies on child labour, forced labour and human rights	BIWASE Corporate	CS 3 months after disbursement	Management time

CA #	REFERENCE	FINDING	CORRECTIVE ACTION	RISK	DELIVERABLE	RESPONSIBILITY	PROPOSED TIMEFRAME (CONDITION PRECEDENT (CP)/ CONDITION SUBSEQUENT (CS))	INDICATIVE BUDGET / RESOURCES
ESMS and Policies - Training Requirements								
3.	ADB Safeguard Policy Statement, V. ADB SPS, H. General Corporate Finance, 17 (i) (ii) ADB SPS, Requirements 1 to 3 ADB Prohibited Investment Activities List	There is no specific management system in place for screening and categorisation of projects within the corporate ESMS. The Company relies on the Vietnamese EIA system for the assessment of environmental impacts of any projects it develops. Moreover, for social impacts relating to the land acquisition or impacts to indigenous peoples the Vietnamese legal framework is utilised.	Develop a system for the screening and categorisation of projects in line with the ADB SPS including assessments for the three criterion – Environment, Land Acquisition and Indigenous Peoples – to be applied to all future developments. The system should also be used to screen potential expansion activities against the ADB PIAL. BIWASE may develop a policy document or SOP for future projects where BIWASE is seeking ADB financing such that the EIA should be scoped to align with the ADB SPS (e.g. conducting climate risk assessments, establishing a more robust baseline data such as for air quality, developing a generic construction EMP that includes a monitoring program which can be tailored to any construction works that will be carried out by any of BIWASE business lines or facilities, even if construction EMP or monitoring is not required per the domestic EIA etc.)	Low	Project Screening / EIA Procedure	BIWASE Corporate	CS 6 months after disbursement and prior to any future construction activities which may be financed by ADB (whichever comes first).	Management time
4.	ADB Safeguard Policy Statement, V.	Based on the Site visit, it appears that there is no site-specific ESMS implemented, and no contractor management practices were observed.	Ensure that recruitment and training processes adequately address the HSE competencies required for the HSE personnel. This could include the additional or improved internal management policies and procedures to be developed to address the gaps identified in this ESDD.	Medium	Evidence of training programme implemented at corporate level on the integrated management system, including implementation of site-specific ESMS and contractor management	BIWASE Corporate	CS 3 months after disbursement	Management time
Key E&S Topics - Physical Cultural Resources and Involuntary Land Acquisition								
5.	Safeguard Requirement 1: Environment	No chance find procedure is included in the corporate ESMS.	Include a chance find procedure in the ESMS for future construction activities by BIWASE.	Low	Chance Find Procedure	BIWASE Corporate	CS 6 months after disbursement and prior to any future construction activities which may be financed by ADB (whichever comes first).	Management time
6.	Safeguard Requirement 2: Involuntary Resettlement	The Company does not have a formal policy on land acquisition and resettlement. It is noted that depending on each project, the Company either acquires the land through willing to buy-willing to sell process or follow the government-led process. Based on the evidence gathered it appears that previous land acquisition processes have followed the government led process in Vietnam however valuations of land acquired have been above market rate.	The Company shall develop a policy relating to land acquisition and resettlement that prioritizes willing seller-willing buyer or negotiated settlement. In case that negotiated settlement will result to expropriation the Company will make best efforts to supplement the government led land acquisition process to achieve compensation for loss of assets at full replacement value and the creation of livelihood programmes that ensure displaced persons are able to restore livelihoods to pre-displacement levels following any impacts from Company developments.	Low	Land Acquisition Policy	BIWASE Corporate	CS 6 months after disbursement and prior to any future construction activities which may be financed by ADB (whichever comes first).	Management time
Key E&S Topics - Gender and Development								
7.	ADB Gender and Development Policy (1998)	Decree No 145/2020/ND-CP dated 14 February 2020 covers elements of female workers' entitlements, benefits and sexual harassment policy. Whilst no sexual harassment policy has been formally developed or established by BIWASE, BIWASE indicated that prohibition of sexual	It is recommended that a sexual harassment policy be established by BIWASE.	Low	Sexual harassment policy	BIWASE Corporate	CS 6 months after disbursement	Management time

CA #	REFERENCE	FINDING	CORRECTIVE ACTION	RISK	DELIVERABLE	RESPONSIBILITY	PROPOSED TIMEFRAME (CONDITION PRECEDENT (CP)/ CONDITION SUBSEQUENT (CS))	INDICATIVE BUDGET / RESOURCES
		harassment is regularly communicated to all workers within BIWASE and no sexual harassment cases have ever been raised or reported since the establishment of BIWASE.						
Key E&S Topics - Labour and Social Protection								
8.	Social Protection Strategy (2001) ADB Gender and Development Policy (1998) Public Communication Policy (PCP) (2011)	BIWASE has an internal grievance mechanism which allows workers to log their grievance through their line manager and/or the Trade Union. According to the mechanism, once a grievance is received it will be processed according to the legal provisions for grievance resolution. Reportedly there have not been any grievances officially lodged by workers. A grievance mechanism that has not been used can often be evidence that the system is ineffective and may require further consideration to ensure workers have a voice with regards to internal grievances related to employment.	Ensure communication of internal GRM to employees and implementation of the internal GRM which will be used by workers and maintain a log for grievances.	Low	Evidence of communication of the internal GRM to staff via various media (e.g. employee handbook, notice boards, internal comms, etc)	BIWASE Corporate	CS1 month after start of operations, and every time a new employee is hired, and evidence of communications provided to ADB as part of the E&S performance reporting.	Management time
9.	Social Protection Strategy (2001) ADB Gender and Development Policy (1998) Public Communication Policy (PCP) (2011)	According to information provided by BIWASE, the company has never had to undertake retrenchment of its staff. Based on currently available documented information, no retrenchment policy or employment termination related policy has been sighted. According to the Labour Code, an employer has a legal responsibility to implement labour requirements stipulated in the Labour Code in the event of a unilateral termination of employment contract or retrenchment in case of changes in structure, technology or due to economic reasons. The agreement has been reviewed and approved by the responsible governmental department. It is however noted that there is no foreseeable retrenchment at BIWASE based on its current status.	According to the Labour Code, an employer has a legal responsibility to implement labour requirements stipulated in the Labour Code in the event of a unilateral termination of employment contract or retrenchment in case of changes in structure, technology or due to economic reasons. Even though the agreement has been reviewed and approved by the responsible governmental department, it is recommended that BIWASE incorporates explicit labour-related conditions in the event of an employment contract termination and retrenchment in both the collective labour agreement and individual employment contracts. Develop a retrenchment policy or employment termination related policy, including the need to conduct an analysis of alternatives to retrenchment prior to implementing any collective dismissals; should there be no viable alternatives to retrenchment, a retrenchment plan should be developed and implemented to reduce the adverse impacts of retrenchment on workers; and ensuring that all workers receive notice of dismissal and severance payments mandated by law and collective agreements in a timely manner.	Low	Retrenchment Policy	BIWASE Corporate	CS 6 months after disbursement	Management time
Key E&S Topics - Grievance Redress Mechanism								
10.	ADB Safeguards 1: Environmental, 2: Involuntary Resettlement and 3: Indigenous Peoples	Although grievances in Viet Nam are typically handled via the relevant CPC, there is no documented transparent grievance mechanism for stakeholders to access if they wish to raise complaints against the company. No records of logged grievances are available for review.	Develop an external GRM and ensure it is communicated to external stakeholders; maintain a log for grievances.	Medium	1. Grievance Mechanism 2. Evidence that GRM was communicated to stakeholders. 3. GRM log.	BIWASE Corporate	1. Prior to commercial operation 2. CS, 3 months after commercial operation and annually thereafter, and evidence of communications provided to ADB as part of the E&S performance reporting. 3. CS, for inclusion in the E&S performance reports for	Management time

CA #	REFERENCE	FINDING	CORRECTIVE ACTION	RISK	DELIVERABLE	RESPONSIBILITY	PROPOSED TIMEFRAME (CONDITION PRECEDENT (CP)/ CONDITION SUBSEQUENT (CS))	INDICATIVE BUDGET / RESOURCES
							submission to ADB	

6.2 CORRECTIVE ACTION PLAN AT THE PROJECT LEVEL

Table 6-2 Corrective Action Plan at the Project Level

CA #	REFERENCE	FINDING	CORRECTIVE ACTION	RISK	DELIVERABLE	RESPONSIBILITY	PROPOSED TIMEFRAME (CONDITION PRECEDENT (CP)/ CONDITION SUBSEQUENT (CS))	INDICATIVE BUDGET / RESOURCES
Environmental Assessment								
11.	WBG EHS Guidelines for Waste Management / GIIP	In terms of design and operation, the WtE is not in an enclosed space and therefore there is no system of negative pressure applied to the waste reception area. The tipping area is a waste reception bunker that vehicles reverse up to and tip; waste is then loaded using a crane system. The combustion temperature is monitored in the control room and the input waste is monitored through the weighing station. Industry best practice includes: • Enclosed tipping hall kept under negative pressure; • Tipping only when the tipping hall door is closed; and • Automatic door for the waste bunker.	In terms of design and operation, BIWASE could consider the following improvements in the future to meet GIIP: • Enclosed tipping hall kept under negative pressure; • Tipping only when the tipping hall door is closed; and • Automatic door for the waste bunker.	Low	1. Improvement plan with timelines. 2. Improvements implemented on site.	BIWASE Waste Treatment Complex	1. Prior to commercial operation 2. CS based on the timelines in the agreed improvement plan.	Management time and associated costs to make improvements on Site
Environmental Planning and Management								
12.	Environmental Safeguard, Policy Principle 4	The Company has an integrated QSHE management system manual which covers ISO 14001:2015, ISO 45001:2018 and ISO 9001:2015 for the Site. Whilst the management system is well documented and certified, based on IBIS' assessment, the management systems are not implemented on-site as would be expected in line with these certifications. Poor working practices were observed during the Site visit, and clear evidence in the variation in standards of safety between BIWASE's own staff and external contractors (drivers, construction workers, etc) was also observed.	Ensure an adequate HSE team is put in place to meet local regulatory requirements, implement HSE management measures, and meet BIWASE's management systems / ISO requirements. This should cover both the ongoing construction and existing operations on-site. Given that construction activities are ongoing and are likely to continue for at least 6 to 12 months, to effectively address the EHS issues at the construction area in a timely manner, it is recommended that an additional two staff are dedicated to EHS matters for the construction phase (in addition to those required to meet regulatory requirements for the existing operations). The HSE team should also provide on-site HSE supervision during the construction phase of the Project to ensure that the external contractors are aligned to the same safety standards as BIWASE staff.	Medium	1.Legal requirement is to have a H&S Department or at least two full-time H&S officers 2.Additional two EHS staff recruited to provide oversight in the construction phase of the Project. 3.EHS performance reports of ongoing Incinerator 8 and composting plant No. 3 construction activities based on regulatory requirements and BIWASE's QSHE management system manual.	BIWASE Waste Treatment Complex EHS Lead	1. CS 2 months after disbursement. 2. CS 1 month after disbursement. 3. CS For inclusion in the E&S performance reports for submission to ADB.	Recruitment and training time
Pollution Prevention and Abatement								
13.	Environmental Safeguard, Policy Principle 9	Based on the regular questionnaires conducted by BIWASE with the local community in the area over the period of January 2019 to May 2021, the findings are as	BIWASE should develop and implement a process to establish and understand the health impacts in the community due to the Waste Treatment Complex (if any). This could include a review of the content	Medium	1. Developed process to establish and understand the health impacts in the community due to the Waste	BIWASE	1. Prior to commercial operation	Management time

CA #	REFERENCE	FINDING	CORRECTIVE ACTION	RISK	DELIVERABLE	RESPONSIBILITY	PROPOSED TIMEFRAME (CONDITION PRECEDENT (CP)/ CONDITION SUBSEQUENT (CS))	INDICATIVE BUDGET / RESOURCES
		follows: • 100% of survey participants commented that odour occurrence was infrequent, with most of them indicating that there is no odour or only very rarely or occasionally; • In 2021, survey participants commented that there is not even occasional odour, with some sharing that the odour issue is much improved compared to the past; and • In general, survey participants' opinion against odour and pest issues are positive. Mild odour was noticeable at some points around the perimeter of the Site during the visit, which is expected for a waste site, and is not considered to be of major concern.	of the questionnaire sent to the communities near the Waste Treatment Complex to add items to capture any impacts on public health, and based on the responses to its questionnaires and/or statistics from public health facilities, track the situation moving forward.		Treatment Complex (i.e., health questions in the questionnaire that BIWASE regularly administers to the community, plan for ambient air quality monitoring at sensitive receivers outside the BIWASE fence line.)			
14.	Environmental Safeguard, Policy Principle 9	Given that the Project includes an 8,400 kg/hour incinerator and there are various sensitive receivers around the site, cumulative air quality impacts need to be considered especially since there are other emission sources within and around the Site (i.e. other incinerators within the Waste Treatment Complex, stack from the adjacent cemetery, emissions from a nearby plastics recycling plant). Subsequent to its initial impact assessment, ADB's air quality consultant conducted an updated air quality impact assessment which was provided to IBIS for review. ADB's air quality consultant also conducted a review of BIWASE's "Proposed Waste-to-Energy Plant Design Improvement Report"; the documents/studies that underpin this report were not reviewed.	BIWASE shall consider and incorporate the recommendations from the ADB's air quality consultant's updated air quality assessment and review of BIWASE's "Proposed Waste-to-Energy Plant Design Improvement Report" accordingly. These include: • Retrofitting a bag filter with upstream injection of sodium bicarbonate and activated carbon - considered as "Best Available Techniques" (BAT) in Europe. This should result in significantly improved abatement of particulate matter, sulphur dioxide, hydrogen chloride, heavy metals including mercury and dioxins and furans. If properly configured and operated, this approach should allow compliance with EU and Japanese emission limits shown in the report for the parameters above (assuming the raw flue gas is broadly typical composition for a MSW fired incinerator). • Limit on emissions concentration of nitrogen dioxide from the proposed facility to 400 mg/Nm^3.	High	1. Evidence of design improvement: confirmation report from external consultant/expert, with flue gas emission result during trial operation. 2. Flue gas emission monitoring results provided to ADB every 6 months as part of the E&S performance reporting. E&S performance reporting may be reduced to annual basis once consistent compliance with emission standard is noted.	BIWASE	1. Prior to commercial operation. 2. CS, for inclusion in the E&S performance report for submission to ADB.	Capex estimated to be > US$1.2million

CA #	REFERENCE	FINDING	CORRECTIVE ACTION	RISK	DELIVERABLE	RESPONSIBILITY	PROPOSED TIMEFRAME (CONDITION PRECEDENT (CP)/ CONDITION SUBSEQUENT (CS))	INDICATIVE BUDGET / RESOURCES
15.	Environmental Safeguard, Policy Principle 9	No documented information on GHG emissions has been identified in the 2022 EIA, nor provided by BIWASE. Processes such as composting and incineration will generate GHG, and with the capacity of the Project, it might constitute a significant amount.	BIWASE to quantify the direct emissions from the Project within the physical Project boundary and indirect emissions associated with the off-site production of power used by the Project (if any). The quantification and monitoring of GHG emissions shall be conducted annually in accordance with internationally recognised methodologies (e.g. the GHG Protocol). In addition, the BIWASE shall evaluate technically and financially feasible and cost-effective options to reduce or offset project-related GHG emissions during project design and operation and pursue appropriate options.	Low	1. Agreed procedure for quantification of GHG emissions in line with an appropriate reporting methodology for the project financed compost line and WTE plant – ADB use of proceeds. 2. Reporting of estimated GHG emissions for the project financed WTE plant and Compost line.	BIWASE Waste Treatment Complex	1. Prior to commercial operation 2. CS, for inclusion in the E&S performance report for submission to ADB.	External consultant fees
Health and Safety								
16.	Environmental Safeguard, Policy Principle 10 Social Protection Strategy	Despite BIWASE's ISO management system certifications, relevant practices do not seem to be adopted on-site. For example, there were no documents relating to 'Permit-to-work' or health and safety planning for the ongoing construction areas at the WtE and composting plant. Unsafe work practices were observed on Site.	BIWASE should review and update the overall general and occupational H&S management implementation at the Site. More immediate aspects to be reviewed and updated include: • Ensure permit-to-work system is in place and documented adequately, including hot work and confined spaces; • Health and safety planning (through oversight, risk assessments, PPE requirements, etc.) for the ongoing construction areas at the WtE and composting plant; • Selection, use, training and maintenance of PPE, including those required to be used during an emergency situation; • Include a code of conduct for contractors for construction activities, and set out roles and responsibilities for the HSE team on site to monitor contractors and primary suppliers to ensure they are aligned to the Company ESMS and policies; and • Conduct weekly EHS walkthroughs/audits, capturing the findings in or, which tracks findings to closure.	High	1. Documentation/ observations of improved site conditions or adequate implementation of ESMS on Site (i.e., result of safety diagnostic exercise) (same as CAP1 Deliverable 1) 2. Evidence of a working health and safety management system including: • Planning documentation (including risk assessments); • Permit to work system (and evidence of implementation); • H&S monitoring including leading and lagging indicators; • Contractor management records (attendance, permit to work, work instructions, sign in out, etc); and • Weekly EHS assessments by EHS personnel, with issues captured in a log and tracked to closure.	BIWASE Waste Treatment Complex	1. Prior to commercial operation 2. CS Results provided to ADB every 6 months as part of the E&S performance reporting until performance improves. E&S performance reporting may be reduced to annual basis.	Management time
17.	Environmental Safeguard, Policy Principle 10 Social Protection Strategy	The accidents log for 2022 was viewed by IBIS on Site. No other records were available, and near miss records are not maintained. There were reportedly no other accidents since 2004. Given that there are about 1,000 workers on Site, there should be more robust monitoring of leading safety indicators or near misses.	BIWASE shall perform incidents/accidents recording and reporting, including reportable incidents, first aid cases and near misses.	Medium	1. Incident accident register commensurate with the site activities including near misses, minor, moderate, major and reportable incidents. 2. Incident/accident log.	BIWASE Waste Treatment Complex	1. Prior to operation. 2. CS Results provided to ADB every 6 months as part of the E&S performance reporting until performance improves. E&S performance reporting may be	Management time

CA #	REFERENCE	FINDING	CORRECTIVE ACTION	RISK	DELIVERABLE	RESPONSIBILITY	PROPOSED TIMEFRAME (CONDITION PRECEDENT (CP)/ CONDITION SUBSEQUENT (CS))	INDICATIVE BUDGET / RESOURCES
							reduced to annual basis.	
Labour and Working Conditions - Working Hours and Overtime								
18.	Social Protection Strategy (2001)	Based on a sample contract provided, the following points are noted: Working hours and annual leave are not clearly indicated in the contract. There does not appear to be provisions regarding overtime work. The Company had indicated that it adheres to local labour law with regards to working hours. The Company also tracks working hours of employees (by the line managers at each work area) and calculates overtime accordingly by HR team. A sample of a monthly attendance sheet at the Waste Treatment Complex was provided for review.	It is suggested for BIWASE to improve their way of recording the timesheet as it is not easily interrogated at this moment.	Low	Improved timesheet tracking which allows easy interrogation of data.	BIWASE Waste Treatment Complex	CS 3 month after commercial operations	Management time
19.	Social Protection Strategy (2001)	The Company has a Contractor Management Procedure which provides that the contractors and waste suppliers must comply with legal regulations including those regarding labour management, however, there is no explicit provision for the contractors to comply with labour management regulations.	BIWASE to ensure that its Contractor Management Procedure includes provision for its contractors and waste suppliers to comply with labour management regulations, and to ensure that checks/audits are put in place to ensure its implementation. BIWASE is requested to make available to all drivers entering the site: • A flash card of site rules detailing the expectations with regards to use of PPE and other safety provisions; • The card will also detail general safety notifications related to vehicular safety in the waste management sector including lists of key hazards and mitigation measures e.g. o No climbing onto or into vehicles; o Use of high visibility uniforms when working alongside or at the reach of a refuse collection vehicles; o Instructions for safely loading and unloading of roll on/off containers; o Statistics relating to most common injuries or accidents in the	Medium	1. Documentation demonstrating contractual commitments for all new contracts with contractors and waste suppliers; 2. Records of audit of contractor systems and records to confirm compliance with the regulations 3. Submission of information dissemination plan (e.g. flash cards) on use pf proper PPEs, general safety in the waste management sector, etc., including frequency, target audience, budget allocation, etc. 4. Evidence of implementation of information dissemination plan	BIWASE Waste Treatment Complex	1 . CS 1 month from disbursement and evidence provided to ADB every E&S performance reporting 2. CS and evidence provided to ADB every E&S performance reporting 3. CS 3 months from disbursement 4. CS and evidence of implementation according to implementation plan provided to ADB every E&S performance reporting	Management time

CA #	REFERENCE	FINDING	CORRECTIVE ACTION	RISK	DELIVERABLE	RESPONSIBILITY	PROPOSED TIMEFRAME (CONDITION PRECEDENT (CP)/ CONDITION SUBSEQUENT (CS))	INDICATIVE BUDGET / RESOURCES
			waste sector involving vehicles, driver or loaders; o Tips on 'defensive driving'; • These flash cards will also include details of labour rights for workers under Vietnamese Law including working hours, driving house, breaks, pay, holiday entitlement, sick pay, workers organisations etc.; and • Contact details for the relevant government departments regarding labour laws should also be included.					

ANNEX A: KEY DOCUMENT REVIEW LIST

NO	TITLE
1	Technical profile of 8400 kg incinerator.pdf
2	Corporate Environmental and Social Policy.jpeg
3	Integrated Quality System Handbook.docx
4	2015 integrated quality handbook.docx
5	Environment policy.pdf
6	A Grievance Redress Mechanism_Internal.doc
7	VIE BDMSW WtE_FSR 2021_ENG (updated 11 Jan)_w trackchange.docx
8	VIE BDMSW WtE_FSR 2021_ENG (updated 11 Jan)-clean.docx
9	VIE BDMSW WtE_FSR 2021_ENG.docx
10	VIE BDMSW WtE_FSR 2021_VIE.docx
11	VIE BDMSW_ updated EIA (2022) to include the composting plant_ENG.docx
12	VIE BDMSW_ updated EIA (2022) to include the composting plant_VIE.docx
13	VIE BDMSW_EIA (2019)_TOC.odt
14	VIE BDMSW_EIA (2019)_VIE.pdf
15	VIE-BDMSW_EIA-2019_ENG_220228.docx
16	2112 BIWASE's hazardous waste treatment permit issued by MONRE_VIE.pdf
17	General layout - HC Model (1).pdf
18	Layout of 8400 incinerator New-Model 1.pdf
19	Air Emission Standards for MSW Incinerators in the JICA, EU, US-EPA and GOV_15.03.2022.xlsx
20	BIWASE Flue Gas Emission Data Feb-May 2021.xlsx
21	2. DANH MỤC VÀ ĐỊNH MỨC TRANG BỊ PHƯƠNG TIỆN BẢO VỆ CÁ NHÂN NĂM 2021 so 65.xlct.nsqt ngay 14.6.2021 .pdf
22	90-KH-CATX-PCCC&CNCH 05.04.2022 KE HOACH Thuc tap phuong an chua chay va cuu nan, cuu ho tại CNXLCT.pdf
23	BANG NHAN DANG MOI NGUY, DANH GIA RUI RO AN TOAN - SUC KHOE NGHE NGHIEP - TONG HOP CAC BP TRONG CHI .pdf
24	Bien ban thuc tap phuong an chua chay va cuu nan, cuu ho nam 2022.pdf

NO	TITLE
25	Binh Duong Water - Environment - ISO 9001.docx
26	BIWASE 8.4 t WTE AQ Data JUN 21- JUN 22.xlsx
27	BSI 14001 - 2015 VN 03 2022 03 2025.pdf
28	BSI 45001 - 2018 VN 03 2022 03 2025.pdf
29	BSI 9001 - 2015 2020-2023.pdf
30	BSI_Waste Treatment Brand_ISO 14001 - 45001.docx
31	FILE_20220602_151500_DANH MUC TAI LIEU NOI BO - T4-2021.xls
32	FILE_20220602_153722_Bia So tay.pdf
33	FILE_20220602_153722_So tay Tich hop (CL-MT-ATSKNN) 2019 - dùng để in.pdf
34	FILE_20220602_153722_So tay Tich hop (CL-MT-ATSKNN) 2019 - dùng để in_ENG.docx
35	FILE_20220603_113702_KET QUA THUC KE HOACH DAO TAO, TAP HUAN, DIEN TAP 05.05.202.pdf
36	GIAO AN Huan luyen nghiep vu PCCC tai CNXLCT..pdf
37	KE HOACH KIEM SOAT RUI RO VA CO HOI NAM 2022.pdf
38	QĐ02.NSQT QUY DINH TRACH NHIEM - QUYEN HAN VE MOI TRUONG.pdf
39	QĐ05.NSQT QUY DINH TRACH NHIEM VA QUYEN HAN HE THONG QUAN LY ATVSLD - SK NGHE NGHIEP.pdf
40	Site Rules
41	Accidents Log 2022
42	Minutes of meeting with JFE Group regarding the AQ performance of the stack emissions from the WTE facility
43	Environmental Monitoring Report 2021
44	ISO 45001 Manual
45	Emergency response and accident investigation minutes template
46	E&S policy
47	Standard Operating Procedures for Compost Plant 4 and WtE Facility
48	Air quality impact assessment, Ricardo ref. ED16552 Issue: 1 23 June 2022
49	01-19.4.2021 - bien ban hop
50	4. Solid ratio separate
51	10. Questionaires

NO	TITLE
52	51-TB KQ GIÁM SÁT MÔI TRƯỜNG QUÝ 1-2022
53	107-QĐ-XLCT.NSQT - QUYẾT ĐỊNH BAN HÀNH QUY CHẾ QUẢN LÝ AN TOÀN - VSLĐ - PCCC TẠI CNXLCT 2021 - THAY THẾ QUYẾT ĐỊNH SỐ 62-QĐ-XLCT.NSQT NGÀY 24.04.2017 OK
54	185-QD-XLCT.NSQT - Quyet dinh thanh lap Ban an toan - Moi truong va xa hoi 24.06.2022 thay the qd so 166 ngay 7.6.2022
55	193-TB KQ GIÁM SÁT MÔI TRƯỜNG QUÝ 2-2022
56	1232 - Bộ TNMT
57	DKKD có ngành nghề

ANNEX B: LIST OF INTERVIEWEES / SITE VISIT PARTICIPANT LIST

SESSION	ATTENDEES	POSITION
At the Site 2 and 3 June 2022	Bo Thanh Phi	Deputy Director of Waste Treatment Branch
	Nguyen Thi Thuy Trang	Deputy Manager of Municipal Waste Treatment Plant
	Le Hoai Phu	Deputy Manager of Municipal Waste Treatment Plant
	Le Quang Lap	Manager of Industrial Waste Treatment Plant
	Tran Thanh Giang	Deputy Manager of Industrial Waste Treatment Plant
	Tran Hoai Tam	Leader of Construction Team
	Nguyen Huynh Duc Le	Leader of Maintenance Team
	Mai Van Hoang	Manager of Mechanic Workshop
	Nguyen Van Bac	Deputy Manager of Mechanic Workshop
	Tran Hoang Long	Head of Human Resources and Admin Department
	Ho Thi Thanh Thuy	Deputy Head of Human Resources and Admin Department
	Nguyen Thi Hong Diem	Deputy Head of Human Resources and Admin Department
	Luu Thanh Nhan	Deputy Manager of Brick Plant

ANNEX C: REPUTATIONAL RISK REVIEW

A Reputational Risk Review (RRR) objective is to assess a company E&S Reputational Issues using free public sources of information (internet) in a methodological way. The methodology includes:

- Google search using key words (such as “company name” + land grabbing, “company name + pollution”, etc. – only the first 10 sites are reviewed, 5 to 10 key words combination to be done); and
- The screening of a set of strategic web sites (Land Matrix, Environmental Justice Atlas, Global Forest Watch, WWF, Greenpeace & Human Rights Watch, Save the children)

The RRR can extend to a particular sector and geography that are relevant for the target company. It can also extend to other specific matters that are relevant for the assessment (Corruption Perception Index, Human Development Index, etc.).

The RRR was conducted for the Project. The results are presented in the table below.

WEB SITES	CONSULTED (Y/N)	FINDINGS
Result of Google search using the below key words (first 10 results): • Company X + Country X + conflict • Company X + Country X + human rights • Company X + Country X + land grabs • Company X + Country X + pollution • Company X + Country X + accident • Company X + Country X + corruption • Company X + Country X + labour where Company X = **BIWASE**; and Country X = **Viet Nam**	Yes	No significant E&S issues or concerns were identified from the internet search through the use of these key words in English.
Screening of large organization web sites:		
Environment Justice Atlas: The environmental justice atlas documents and catalogues social conflict around environmental issues. It allows to assess potential conflict with communities surrounding the project https://ejatlas.org	Yes	No significant environmental issues or concerns in relation to BIWASE were identified from the internet search in English.
Land Matrix: The Land Matrix is a global and independent land monitoring initiative that promotes transparency and accountability in decisions over land and investment. http://www.landmatrix.org/	Yes	No land acquisition issues or concerns in relation to BIWASE were identified from the internet search in English.
GreenPeace is an independent campaigning organisation, which uses non-violent, creative confrontation to expose global environmental problems, and to force the solutions which are essential to a green and peaceful future. www.greenpeace.org	Yes	No E&S issues or concerns in relation to BIWASE were identified from the internet search in English.

WEB SITES	CONSULTED (Y/N)	FINDINGS
Human Rights Watch is a human rights non-governmental organization headquartered in the USA. www.hrw.org	Yes	No human right issues or concerns in relation to BIWASE were identified from the internet search in English.
Global Forest Watch is an online platform that provides data and tools for monitoring through access to near real-time information about where and how forests are changing around the world. https://www.globalforestwatch.org/	Yes	No entries related to BIWASE were identified.
World Wildlife Fund works to help local communities conserve the natural resources they depend upon; transform markets and policies toward sustainability; and protect and restore species and their habitats. https://www.worldwildlife.org/	Yes	No entries related to BIWASE were identified.
Save the Children's programs address children's unique needs, giving them a healthy start in life, the opportunity to learn and protection from harm. https://www.savethechildren.org/	Yes	No entries related to BIWASE were identified.
Centre for Research on Multinationals (SOMO) is a critical, independent not-for-profit knowledge centre on multinationals. www.somo.nl	Yes	No entries related to BIWASE were identified.
Business & Human Rights Resource Centre: The Resource Centre is an independent non-profit organization. It tracks the human rights policy and performance of over 7500 companies in over 180 countries, making information publicly available. https://www.business-humanrights.org/en/find-companies?letter=o	Yes	No entries related to BIWASE were identified.
Wikileaks is an international non-profit organisation that publishes secret information, news leaks, and classified media provided by anonymous sources. www.wikileaks.org	Yes	No information relevant to BIWASE was identified.

ANNEX D: PHOTOLOG

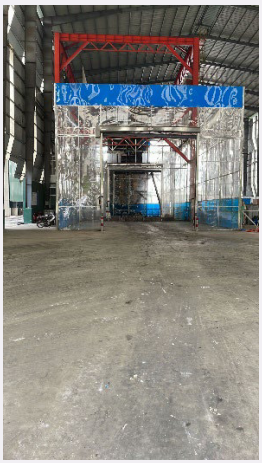

Photo 1: Tipping hall for the incinerator.

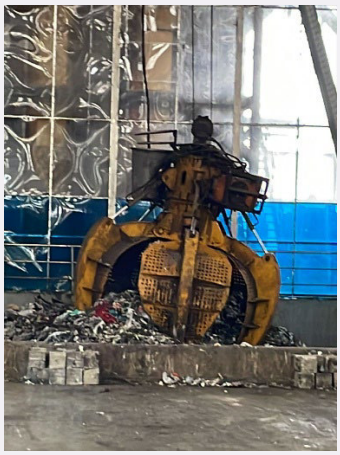

Photo 2: Waste crane.

Photo 3: Incinerator chamber.

Photo 4: Ash disposal collection is conducted manually at a frequency of 90-120 minutes by a forklift to the brick manufacturing plant.

Photo 5: Fly ash hoppers, ash is also sent to the brick manufacturing plant.

Photo 6: 8,400 kg/hour WtE.

Photo 7: Stack for 2x 4200 kg/h line.

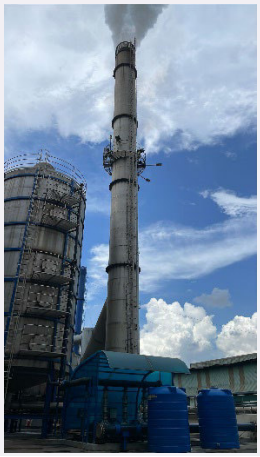

Photo 8: Stack for 8,400 kg/hour WtE.

Photo 9: Close-up photo of a fly ash hopper.

Photo 10: New heat exchanger for 8,400 kg/hour WtE facility (under construction).

Photo 11: Turbine hall under construction.

Photo 12: Turbine hall under construction.

Photo 13: New condenser installed for 8,400 kg/hour WtE facility.

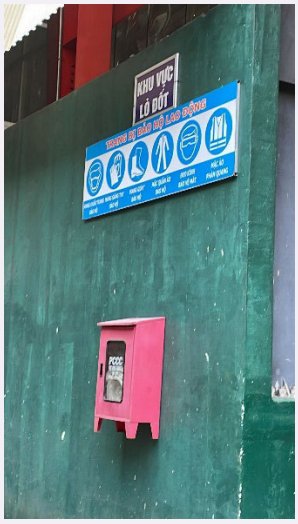

Photo 14: Safety sign at WtE entrance.

Photo 15: 2 x 4,200 kg/hour incinerator and tipping hall; for industrial waste and hazardous waste only.

Photo 16: Bottom ash store.

Photo 17: Compost plant under construction. Civil engineering works for waste reception hall and picking line.

Photo 18: Compost plant 4 construction site. Foundations for the maturation and windrow buildings.

Photo 19: Fermentation compost bays under construction.

Photo 20: Tree line screening from outside perimeter road (taken from road outside the eastern perimeter of the Site, facing west).

Photo 21: Houses on eastern perimeter road (outside the Site).

Photo 22: Houses on eastern perimeter road (outside the Site).

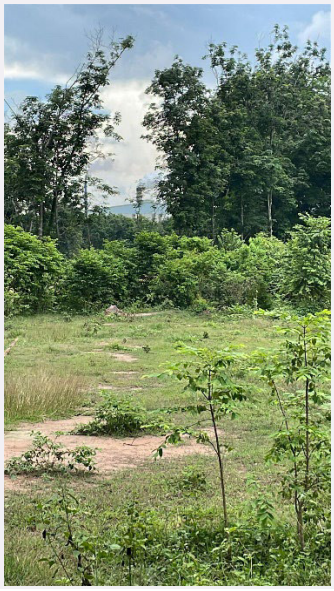

Photo 23: Stack and tree screen from perimeter road (taken from east of the Site, facing west).

Photo 24: Site perimeter wall and screening (taken from east of the Site, facing west).

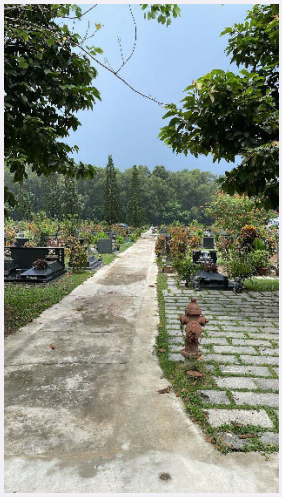

Photo 25: Tree line viewed from the adjacent cemetery, facing the Site.

Photo 26: Tree line viewed from north of the site towards the landfill in operation, approximately 50m from Site boundary; a slight odour detected at this location.

Photo 27: Excavator operating behind the treeline, screened from the cemetery site.

Photo 28: Crematorium in the cemetery adjacent to the Site.

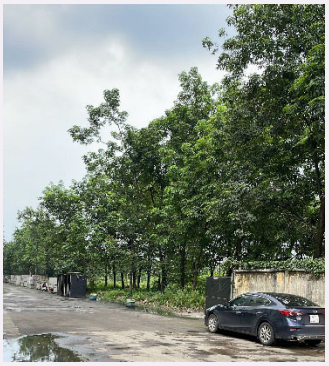

Photo 29: Tree line screening (taken from the Cemetery entrance).

Photo 30: Waste reception area of the new compost plant.

Photo 31: No fall barriers in place around the waste reception area of the new compost plant; estimated 5-7m drop.

Photo 32: Third party contractor undertaking form work and concrete pour for dirty material recovery facility at new compost plant without fall protection measures.

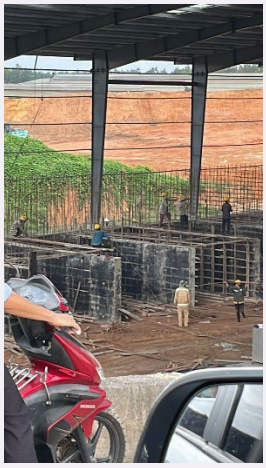

Photo 33: 3rd party contractor undertaking form work and concrete pour for dirty material recovery facility at new compost plant without fall protection measures.

Photo 34: Compost plant 3 Fermentation building in the background.

Photo 35: Entry ramp to the landfill site; two-way traffic observed around landfill site and this access road between compost plants 3 & 4 with potential internal traffic management issues.

Photo 36: Waste reception warehouse for compost plant #3. Noise at this location was noticeable and there does not appear to be any hearing protection required at this location.

Photo 37: Raw garbage separation warehouse which was observed to be very noisy; safety signs in the area do not include requirement for hearing protection.

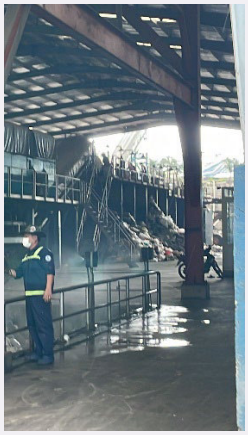

Photo 38: Manual picking line for compost plant #3. A motorcycle was observed parked / passing through the plant at this location whilst IBIS was observing.

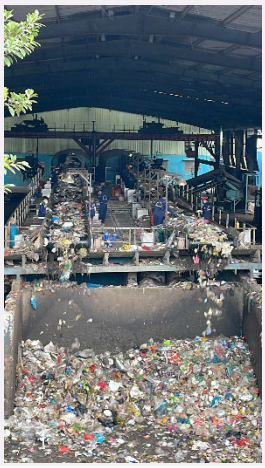

Photo 39: Manual picking line with around 20 workers; no mandatory hearing protection.

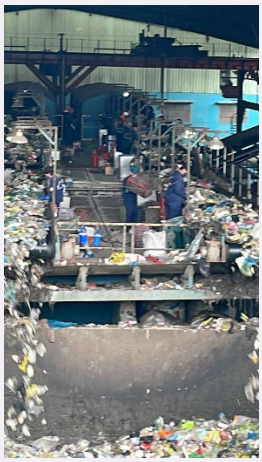

Photo 40: Supervisor in green hat wearing flip flops.

Photo 41: Landfill entrance.

Photo 42: Landfill with sheeting cover.

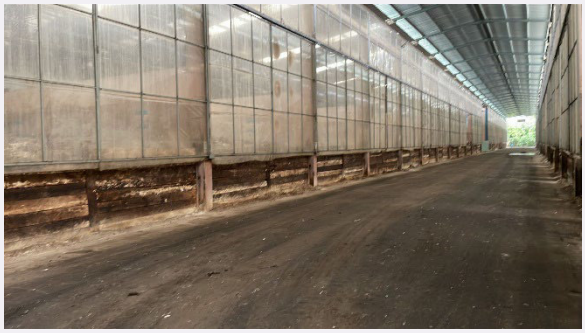

Photo 43: Fermentation bays in compost plant 3.

Photo 44: Safety / hazard signs at fermentation bays in compost plant 3.

Photo 45: Maturation schedule at compost plant 3.

Photo 46: Firefighting rules at compost plant 3.

Photo 47: Indoor windrow composting.

Photo 48: Indoor windrow composting.

Photo 49: Raw waste visible in the right side of the photo is passed through a trommel screen and fractions are conveyed to the left which is the fermentation plant.

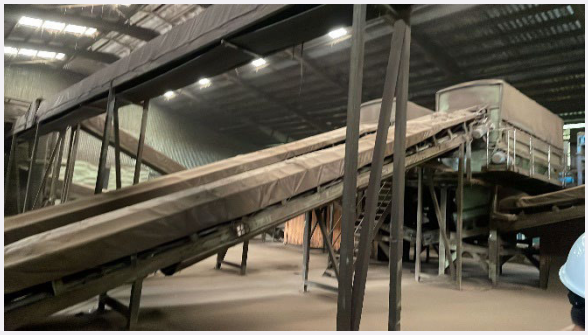

Photo 50: Processing of final product refinement at compost plants 1 to 3; removal of non-organics (mainly plastic).

Photo 51: Process of final product refinement at compost plants 1 to 3. Plastic rejects directed to the WtE.

Photo 52: Process of final product refinement at compost plants 1 to 3.

Photo 53: Process of final product refinement at compost plants 1 to 3.

Photo 54: Process of final product refinement at compost plants 1 to 3 with refined humus.

Photo 55: View of three stacks in the main area (not ADB-financed stacks)

Photo 56: Interview with a household to the east of the site and a resident who lives 500m from the plastic recycling plant located to the east of the BIWASE site. This residence is around 25m from the BIWASE fence line.

Photo 57: Plastic recycling plant to the east of the Site.

Photo 58: Interview with a household on district road DH604, southeast of the Site.

ANNEX E: VIETNAMESE LEGAL FRAMEWORK

Environment

1. National Level: Legal framework of the Government of Viet Nam: Law, decrees, and circular of the Government of Viet Nam on environment include:

i) Law on Environmental Protection No. 55/2014/QH13 passed by the 13th National Assembly of the Socialist Republic of Viet Nam on 23rd June 2014 and effective from 1st January 2015;ii) Law on Water Resources No. 17/2012/QH13 passed by the 13th National Assembly of Viet Nam, 3rd session dated 21st June 2012;

iii) Law on Biodiversity No. 20/2008/QH12 passed by the 12th National Assembly of the Socialist Republic of Viet Nam dated 13th November 2008;

iv) Decree No. 18/2015/ND-CP dated 14th February, 2015 of the Government on environmental protection planning, strategic environmental assessment, environmental impact assessment and environmental management plan;

v) Decree No. 40/2019/ND-CP dated 13th May 2019 of the Government on amendments to decrees on guidelines for the law on environment protection;

vi) Decree No. 19/2015/ND-CP dated 14th February 2015 of the Prime Minister detailing the implementation of a number of articles of the Law on Environmental Protection;

vii) Decree No. 201/2013/ND-CP dated 27th November 2013 of the Government detailing implementation of a number of articles of the Law on Water Resources;

viii) Decree No. 38/2015/ND-CP dated 24th April 2015 of the Government on management of waste and discarded materials.

ix) Decree No. 80/2014/ND-CP dated 6th August 2014 of the Government on wastewater drainage and treatment;

x) Circular No. 27/2015/TT-BTNMT dated 29th May 2015 of MONRE on strategic environmental assessment, environmental impact assessment and environmental protection plans;

xi) Circular No. 25/2019/TT-BTNMT dated 31st December 2019 of MONRE on elaborating some articles of the Government's Decree No. 40/2019/ND-CP dated 13th May 2019 on amendments to decrees on guidelines for the Law on Environmental protection and providing for management of environmental monitoring services

xii) Circular No. 36/2015/TT-BTNMT dated 30th June 2015 of MONRE on management of hazardous wastes; and

xiii) Circular No. 32/2013/TT-BTNMT dated 25th October 2013 of MONRE on promulgation of national technical regulations on environment.

Labour, Health and Safety

National Level: Legal framework of the Government of Viet Nam: Law, decrees, and circular of the Government of Viet Nam on Health and Safety include:

i) Law on amendment and supplement of a number of articles of Law on Fire Prevention and Fighting No.40/2013/QH13 passed by the 13th National Assembly of the Socialist Republic of Viet Nam dated 22nd November 2013.

ii) Law on Occupational Safety and Health No. 84/2015/QH13 issued on 25th June 2015;

iii) Circular No. 19/2016/TT – BYT dated 30th June 2016 of MOH on guidelines for occupational health and safety management;

iv) Circular No. 22/2010/TT-BXD dated 3rd December 2010 of MOC on labour safety in work construction;

v) Labour Code (10/2012/QH13);

vi) Decree No. 85/2015/ND-CP of the Prime Minister of Viet Nam dated on 1st October 2015 regarding detailed regulations of articles of Labour law on policies for female employees.

vii) Decree No. 141/2017/ND-CP prescribing the regional minimum wage rates for employees working under employment contracts.

viii) Decree No. 53/2016/ND-CP regulations on management of employees, salaries, remuneration and bonuses of joint-stock Companies.

ix) Decree No. 39/2016/ND-CP detailing the implementation of some articles of the Law on Occupational Safety and Health.

x) Decree 85/2015 / ND-CP stipulating in detail a number of articles of the Labour Code on the labour policy for women.

xi) Decree No. 05/2015/ND-CP detailing and guiding a number of provisions of the Labour Code.

xii) Decree No. 103/2014/ND-CP stipulating the minimum wage for employees working in enterprises, cooperatives, cooperative groups, farms, households, individuals, agencies and organisations that hire workers.

xiii) Circular No. 04/2014/TTBLDTBXH containing Guidelines to implement measures for the wearing of personal protective equipment.

xiv) Decree No. 03/2014/ND-CP detailing a number of articles of the Labour Code on employment.

xv) Circular No. 27/2013/TTBLDTBXH regulating occupational health and safety training.

xvi) Circular No. 25/2013/TT-BLDTBXH Guiding the implementation of the regime of allowances to employees working in dangerous and hazardous conditions.

xvii) Circular No. 26/2013/TT-BLDTBXH promulgating the categories of jobs in which women are not to be employed.

xviii) Circular No. 11/2013/TT-BLDTBXH promulgating the list of light tasks permitted for persons under 15 years old.

xix) Circular No. 08/2013/TT-BLDTBXH of 10 June 2013, guiding the Government's Decree No. 46/2013/ND-CP of May 10, 2013, detailing a number of articles of the Labour Code regarding labour disputes.

xx) Circular No. 10/2013/TT-BLDTBXH promulgating the list of jobs and workplaces prohibited to young workers.

xxi) Decree No. 49/2013/ND-CP of May 10, 2013, detailing a number of articles of the Labour Code regarding wages.

xxii) Decree No. 45/2013/ND-CP of May 10, 2013, detailing a number of articles of the Labour Code on working time, rest time and occupational safety and health.

xxiii) Decree No. 46/2013/ND-CP of May 10, 2013, detailing a number of articles of the Labour Code regarding labour disputes.

xxiv) Decree No. 44/2013/ND-CP of May 10, 2013, detailing a number of articles of the Labour Code regarding labour contracts.

xxv) Decree No. 41/2013/ND-CP of May 8, 2013, detailing the implementation of the Labour Code's Article 220 on the list of employing units in which strikes are prohibited and settlement of demands of employees' collectives in these units.

xxvi) Circular No. 14/2013/TT-BYT guiding medical examinations.

It should be noted that from January 2022 the following regulations have become effective:

- Law on Environmental Protection No. 72/2020/QH14 passed by the 14th National Assembly of the Socialist Republic of Viet Nam on 17th November 2020 is effective from 1st January 2022
- Decree 08/2022/ND-CP Guiding implementation of the LEP 2020.
- Circular 02/2022/BTNMT Guiding implementation of the LEP 2020

However, since the Project is initiated prior to the new Law on Environmental Protection is effective, therefore the legal requirements (specifically those related to the EIA) applicable to the Project are the regulations issued prior to 2022. Per these new regulations, BIWASE will need to migrate its current individual environmental permits to a consolidated environmental permit, however the timeline is until 2027 or expiry of any individual permit, whichever comes first.

Key national technical regulations (QCVN) relevant and applicable to the Project are listed in the following table:

Table 6-3 Key National Technical Regulations relevant to the Project

NO.	QCVN	DETAILS
I. QCVN with Respect to Air		
	QCVN 05:2013/BTNMT	National technical regulations on ambient air quality
	QCVN 06:2009/BTNMT	National technical regulations on some hazardous substance in ambient air
	QCVN 19:2009/BTNMT	National Technical Regulation on industrial emissions of dust and other inorganic pollutants
II. QCVN with Respect to Water		
	QCVN 01:2009/ BYT	National technical regulations on drinking water quality
	QCVN 08 MT:2015/BTNMT	National technical regulations on surface water quality
	QCVN 09:2015/BTNMT	National technical regulations on ground water quality
	QCVN 14:2008/BTNMT	National technical regulations on domestic water
	QCVN 40:2011/BTNMT	National technical regulations on industrial wastewater
III. QCVN with Respect to Noise and Vibration		
	QCVN 26:2010/BTNMT	National technical regulations on noise in public and residential areas
	QCVN 27:2010/BTNMT	National technical regulations on vibration in public and residential areas
IV. QCVN with Respect to Solid Waste		
	QCVN 07:2009/BTNMT	National technical regulations on thresholds for hazardous waste
	TCVN 6707:2009/BTNMT	Hazardous waste: Signs of warning and prevention
	TCVN 6705:2009/BTNMT	Ordinary solid waste
	TCVN 6706:2009/BTNMT	Classification of hazardous waste
V. QCVN with Respect to Wastewater		
	QCVN 40:2011/BTNMT	National technical regulations on industrial wastewater
	QCVN 25:2009/BTNMT	National technical regulations on leachate quality
VI. National Technical Regulations on Heavy Metals in Soil		

NO.	QCVN	DETAILS
	QCVN 03:2015/BTNMT	National technical regulations on allowable limits for some heavy metals in soil
VIII. Regulations issued by Ministry of Health on Labour Hygiene		
	Decision no. 3733/2002/QD-BYT	On the issuance of 21 labour hygiene standards, 5 principles and 7 labour hygiene measurements
	QCVN 22:2016/BYT	National technical regulations on illumination at workplace
	QCVN 24:2016/BYT	National technical regulations on Noise at workplace
	QCVN 27:2016/BYT	National technical regulations on vibration at workplace
VIII. Other Applicable Technical Regulations/Standards		
	QCVN 07:2010/BXD	National technical regulations on urban technical infrastructure
	TCXDVN 33:2006	Water supply - Standards for designing pipe networks and treatment facilities
	Decree no. 113/2017/ND-CP	Detailing and guiding the implementation of some articles in the Law on Chemicals

Land Acquisition, Compensation and Resettlement

The Vietnamese government has enacted a number of laws and regulations that constitute a national legal framework for land acquisition, compensation and resettlement. In addition, the Binh Duong PPC has also issued Decisions that supplement national legislation and address the specificities of the Project.

1. National Level: Legal framework of the Government of Viet Nam: Law, decrees, and regulations of the Government of Viet Nam on land acquisition, compensation, resettlement and ethnic minority include:

i) The Constitution of the Socialist Republic of Viet Nam, 2013 (Confirms the right of citizens to own and protects the ownership of house and production materials of citizens; compensation by market rate is made for impacts by the projects implemented for the purposes of national defence, security or public benefits (Article 32). Similarly, organizations and individuals have land use rights certificates and law protects these rights. In the case of land recovery for the purposes of national defence, security and socioeconomic development, compensation shall follow the provisions of law (Article 54);

ii) Land Law 2013 (No. 45/2013/QH13) dated 29th November 2013;

iii) Decree No. 16/2016/ND-CP dated 16th March 2016 on management and utilisation of Official Development Assistance (ODA) and concessional loans from donors;

iv) Decree 132/2018/NĐ-CP dated on 1st October 2018 of Government amending and supplementing some articles of Decree 16/2016/NĐ-CP about management and using ODA and preferential loans of sponsors from abroad;

v) Decree No. 43/2014/NĐ-CP dated 15th May 2014 on detailing a number of articles of the Land Law 2013;

vi) Decree No. 44/2014/NĐ-CP dated 15th May 2014 on regulations on land prices;

vii) Decree No.47/2014/NĐ-CP dated 15th May 2014 on compensation, assistance, and resettlement upon land recovery by the State;

viii) Decree No.06/2020/ND-CP dated on 3rd January 2020 on amendments to Article 17 of Decree No. 47/2014/ND-CP providing for compensation, support and resettlement when the State recovers land;

ix) Decree No. 01/2017/ND-CP dated on 6th January 2017 adjusting some articles of the Decree No. 43/2014/ND-CP on the implementation of certain articles of the Land Law, Decree No. 44/2014/ND-CP on land price, and Decree No. 47/2014/ND-CP on compensation, support and resettlement for the government's expropriation of land;

x) Circular No. 36/2014/TT-BTNMT on land pricing method;

xi) Circular No.37/2014/TT-BTNMT on guidelines in implementation of Decree No.47/2014/NĐ-CP;

xii) Decision No.775/QĐ-Tf-GM dated 20th May 2013 on policy on supporting housing land, agricultural land, clean water to poor ethnic households and needy ones in the disadvantaged communes; and

xiii) Decree No. 75/2015/NĐ-CP dated 9th September 2015 on mechanism and policies on forest protection and development in combination with sustainable and fast poverty alleviation and support for ethnic groups during 2015 – 2010.

2. Province Level (Binh Duong PPC): Binh Duong PPC has promulgated the Decisions for compensation, assistance and resettlement policy when land is acquired by the State in Binh Duong Province as follows:

i) Decision No.51/2014/QĐ-UBND dated on 18th December 2014 on promulgating compensation, assistance and resettlement policy when land is acquired by the State in Binh Duong Province;

ii) Decision No.04/2017/QĐ-UBND dated on 17th February 2017 on adjusting the price unit for types of land in the territory of Binh Duong Province;

iii) Decision No.25/QD-UBND dated on 22th July 2015 on promulgating price unit for compensation and assistances for affected assets on land in the territory of Binh Duong Province;

iv) Decision 03/2018/QD-UBND dated 9th February 2018 on amending and supplementary some articles of Decision No. 25/2015 dated on 22th July 2015 on promulgating price unit for compensation and assistances for affected assets on land in the territory of Binh Duong Province.; and

v) Decision No.258/QĐ-UBND dated on 25th January 2018 on approving the compensation price unit for affected land to implement the project "Expansion of Tan Hiep water treatment plant" in Tan Hiep ward, Tan Uyen town.

Ethnic Minority Affairs

With regard to Ethnic Minorities (EMs) Viet Nam's Constitution (2013) mandates the State to "implement a policy on equality, unity and support for all ethnic groups in the development of a civilized society, and respect benefits, traditional cultures, languages and religions of ethnic minority groups (Article 5). A ministerial-level government body, Committee for Ethnic Minority Affairs is tasked for developing and overseeing policies and programs to promote the welfare of EMs. Programs that target EMs are numerous and diverse and cover a wide range of issues, including poverty reduction, resettlement and settled agriculture, productive and residential land allocation, education, health and communication, cash subsidies on land reclamation, improvement of commune and village infrastructure, etc. Key regulations involving EMs in Viet Nam are presented below in a chronological order.

i) Decision No. 1898 / QD-TTg dated 28th November 2017 of the Prime Minister approving project of "Supporting Gender Equality in Ethnic Minorities in the Period 2018-2025"

ii) Decision No. 1163 / QD-TTg dated 8th August 2017 of the Prime Minister approving the project "Promote law dissemination and education and propagandise in ethnic minority and regional areas mountain period 2017-2020"

iii) Decision No. 414 / QD-UBDT dated 11th July 2017 of the National Committee for Ethnic Minority Affairs approving the list of extremely difficult villages to be invested in Program 135 period 2017-2020

iv) Decision No. 2085 / QD-TTg dated 31st October 2016 of the Prime Minister approving the specific policy on support for socio-economic development of ethnic minority and mountainous areas in the period of 2017-2020

v) Decision No. 1008 / QD-TTg dated 2nd June 2016 of the Prime Minister approving the Scheme on Strengthening Vietnamese Language Preparation for Preschool Children and Elementary School Children in ethnic minority area in period 2016-2020, orientation to 2025

vi) Decision No. 1747 / QD-TTg dated 13th October 2015 of the Prime Minister approving the program of supporting the transfer of scientific and technological advances to promote the socio-economic development of rural mountainous areas of ethnic minority Period 2016-2025

vii) Decision No. 2356 / QD-TTg, dated 4th December 2013 of the Prime Minister promulgating the Action Program for implementation of the ethnic minority strategy up to 2020

viii) Decision No. 449 / QĐ-TTg dated 12th March 2013 of the Prime Minister approving the strategy for ethnic minority to 2020

ix) Decree No. 80/2011/NQ-CP on sustainable poverty reduction, period of 2011-2020

x) Decree No. 05/2011/NĐ-CP on the work of ethnic minority.

xi) Decree No. 82/2010/ND-CP, dated 20th July 2010 on teaching and learning of ethnic minority languages in schools.

xii) Resolution No. 30a/2008/NQ-CP, dated 27th December 2008 on support program for rapid and sustainable poverty reduction for 61 poorest districts

xiii) Decree No. 60/2008/NĐ-CP dated 9th May 2008 of the government on the functions, tasks, authorities and structure of the Committee for Ethnic Minorities and Mountainous Areas Affairs.

xiv) Decision no. 112/2007/QD-TTg of the Prime Minister dated 5th March 2007 on the policy of assistance for relocation and agriculture for Ethnic Minorities from 2007 to 2010.

xv) Decision no. 33/2007/QD-TTg of the Prime Minister dated 20th July 2007 on the policy of assistance to improve knowledge of laws as a program of 135, phase 2.

xvi) Decision no. 01/2007/QD-UBDT dated 31st May 2007 of the Ethnic Minorities Committee on the recognition of communes, districts in the mountainous areas

xvii) Decision no. 05/2007/QD-UBDT dated 6th September 2007 of the Ethnic Minorities Committee on its acceptance for three regions of ethnic minorities and mountainous areas based on development status

xviii) Circular no. 06 dated 20th September 2007 of the Ethnic Minorities Committee guidance on the assistance for services, improved livelihood of people, technical assistance for improving the knowledge on the laws according Decision 112/2007/QD-TTg

xix) Decision no. 06/2007/QD-UBDT dated 12th January 2007 of the Ethnic Minorities Committee on the strategy of media for the program 135-phase 2

xx) Decree no. 59/1998/ND-CP dated 18th July 1998 prescribing lump-sum allowance regime applicable to relatives of people with meritorious services to the revolution who had died before 1st January, 1995

xxi) Decree no. 51/2003/ND-CP, amending and supplementing a number of articles of Decree no. 87ND-CP of 19th December, 1996 detailing the assignment of responsibilities for managing, drafting, implementing and settling the state budget

With regards to the regulatory process of developing and implementing an EIA in Viet Nam, below briefly describes the key steps involved:

- Step 1: Construction projects are screened to identify which requirement of environmental assessment is applied based on Annex II of Decree 40/2019/ND-CP on amendments to decrees on guidelines for the law on environment protection.

- Step 2: Depending on the nature and scale of the project, the project owner may be required to prepare an EIA to submit to MoNRE/PPC or an Environment Protection Plan to District People Committee for review and approval/clearance.
- Step 3: Organisation of an appraisal broad to review the EIA within a maximum of 45 days from the day of receipt of the EIA in the case of EIA submission to MoNRE and 30 days in case of EIA submission to PPC.
- Step 4: In case of the EIA being cleared by the appraisal board without any requirement of further adjustments, the appraisal agencies have the responsibility to inform the project owner on the EIA approval within 5 days from the appraisal day. In the case where the EIA report is required to be amended and supplemented, within 12 months from the date of receipt of the notice of the appraisal result, the project owner must amend and complete the EIA report according to the comments from the appraisal result and submit it to the appraisal agency for further review and approval of the EIA report.
- Step 5: After receiving the revised EIA report sent by the project owner, the appraisal agency shall:

  a) Within 20 working days after receiving the revised EIA report, the appraisal agency shall issue a decision approving the EIA report.

  b) In case of ineligibility for approval or non-approval, within 10 working days after receiving the revised report, the appraisal agency must send a written letter clearly stating the reasons of the non-approval to the project owner.

ANNEX F: SAMPLES OF RESPONSES TO THE COMMUNITY QUESTIONNAIRES

CHI NHÁNH XỬ LÝ CHẤT THẢI
NM XỬ LÝ CHẤT THẢI SINH HOẠT

CHI NHÁNH XỬ LÝ CHẤT THẢI CÔNG TY CỔ PHẦN NƯỚC-MÔI TRƯỜNG BÌNH DƯƠNG TX. BẾN CÁT-T. BÌNH DƯƠNG

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

M01-QT32/XLCT

PHIẾU KHẢO SÁT, ĐÁNH GIÁ
(V/v: Hiệu quả khử mùi và xử lý côn trùng tại Khu liên hợp Xử lý chất thải Nam Bình Dương)

Hôm nay, vào lúc ..08..giờ..40.phút ngày..10./..08../..2022

Chúng tôi gồm:

1. Ông/bà: Đinh Thị Thanh Loan
   Đại diện cho: Chi nhánh Xử lý chất thải
   Địa chỉ: Khu phố 1B, phường Chánh Phú Hòa, TX. Bến Cát, tỉnh Bình Dương
   Điện thoại: 0274.354.906
2. Ông/bà: Nguyễn Thị Thảo
   Đại diện cho:
   Địa chỉ: 121, Tổ 4, KP4, P. Chánh phú hòa, BC, BD
   Điện thoại:

Chúng tôi cùng tiến hành khảo sát, đánh giá các tiêu chí về mùi và côn trùng tại địa chỉ:

- Ông/bà đánh giá, nhận xét về mùi tại vị trí hiện tại như thế nào?

☒ Không có ☐ Hiếm khi ☐ Thỉnh thoảng ☐ Thường xuyên ☐ Luôn luôn

- Mật độ côn trùng (ruồi) tại vị trí hiện tại:

☒ Không có ☐ Rất ít ☐ Ít ☐ Hơi nhiều ☐ Nhiều

- Ý kiến khác:....Không....có..mùi..rác.....
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ĐD HỘ DÂN ĐƯỢC KHẢO SÁT **ĐD CN XỬ LÝ CHẤT THẢI**

Thảo

Nguyễn Thị Thảo

Loan

CHI NHÁNH XỬ LÝ CHẤT THẢI
NM XỬ LÝ CHẤT THẢI SINH HOẠT

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

M01-QT32/XLCT

PHIẾU KHẢO SÁT, ĐÁNH GIÁ
(V/v: Hiệu quả khử mùi và xử lý côn trùng tại Khu liên hợp Xử lý chất thải Nam Bình Dương)

Hôm nay, vào lúc ..09..giờ..00..phút ngày 24/.08./2022

Chúng tôi gồm:

1. Ông/bà: Đinh Thị Thanh Loan
   Đại diện cho: Chi nhánh Xử lý chất thải
   Địa chỉ: Khu phố 1B, phường Chánh Phú Hòa, TX. Bến Cát, tỉnh Bình Dương
   Điện thoại: 0274.354.906
2. Ông/bà: Nguyễn Xuân Hiếu
   Đại diện cho:
   Địa chỉ: 130 tổ 4, KP1A, Chánh Phú Hòa, BC
   Điện thoại:

Chúng tôi cùng tiến hành khảo sát, đánh giá các tiêu chí về mùi và côn trùng tại địa chỉ:

- Ông/bà đánh giá, nhận xét về mùi tại vị trí hiện tại như thế nào?

☑ Không có ☐ Hiếm khi ☐ Thỉnh thoảng ☐ Thường xuyên ☐ Luôn luôn

- Mật độ côn trùng (ruồi) tại vị trí hiện tại:

☑ Không có ☐ Rất ít ☐ Ít ☐ Hơi nhiều ☐ Nhiều

- Ý kiến khác:.....Không có mùi nước.....
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ĐD HỘ DÂN ĐƯỢC KHẢO SÁT **ĐD CN XỬ LÝ CHẤT THẢI**

Nguyễn Xuân Hiếu

CHI NHÁNH XỬ LÝ CHẤT THẢI
NM XỬ LÝ CHẤT THẢI SINH HOẠT

CHI NHÁNH XỬ LÝ CHẤT THẢI CÔNG TY CỔ PHẦN NƯỚC-MÔI TRƯỜNG BÌNH DƯƠNG

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

M01-QT32/XLCT

PHIẾU KHẢO SÁT, ĐÁNH GIÁ
(V/v: Hiệu quả khử mùi và xử lý côn trùng tại Khu liên hợp Xử lý chất thải Nam Bình Dương)

Hôm nay, vào lúc ..09..giờ..25..phút ngày 24/.05./2022

Chúng tôi gồm:

1. Ông/bà: Đinh Thị Thanh Loan
   Đại diện cho: Chi nhánh Xử lý chất thải
   Địa chỉ: Khu phố 1B, phường Chánh Phú Hòa, TX. Bến Cát, tỉnh Bình Dương
   Điện thoại: 0274.354.906
2. Ông/bà: Trần Văn Mường
   Đại diện cho:
   Địa chỉ: 116, Tổ 4, KP1A, P. Chánh Phú Hòa, BC
   Điện thoại:

Chúng tôi cùng tiến hành khảo sát, đánh giá các tiêu chí về mùi và côn trùng tại địa chỉ:

- Ông/bà đánh giá, nhận xét về mùi tại vị trí hiện tại như thế nào?

☒ Không có ☐ Hiếm khi ☐ Thỉnh thoảng ☐ Thường xuyên ☐ Luôn luôn

- Mật độ côn trùng (ruồi) tại vị trí hiện tại:

☒ Không có ☐ Rất ít ☐ Ít ☐ Hơi nhiều ☐ Nhiều

- Ý kiến khác: Không có mùi sắc
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ĐD HỘ DÂN ĐƯỢC KHẢO SÁT **ĐD CN XỬ LÝ CHẤT THẢI**

Trần Văn Mường

CHI NHÁNH XỬ LÝ CHẤT THẢI
NM XỬ LÝ CHẤT THẢI SINH HOẠT

CHI NHÁNH XỬ LÝ CHẤT THẢI CÔNG TY CỔ PHẦN NƯỚC-MÔI TRƯỜNG BÌNH DƯƠNG TX. BẾN CÁT-T. BÌNH DƯƠNG

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

M01-QT32/XLCT

PHIẾU KHẢO SÁT, ĐÁNH GIÁ
(V/v: Hiệu quả khử mùi và xử lý côn trùng tại Khu liên hợp Xử lý chất thải Nam Bình Dương)

Hôm nay, vào lúc ..08..giờ..35..phút ngày 31../..08../..2022

Chúng tôi gồm:

1. Ông/bà: Đinh Thị Thanh Loan

Đại diện cho: Chi nhánh Xử lý chất thải

Địa chỉ: Khu phố 1B, phường Chánh Phú Hòa, TX. Bến Cát, tỉnh Bình Dương

Điện thoại: 0274.354.906

2. Ông/bà: Nguyễn Văn Hai

Đại diện cho:

Địa chỉ: 133, Tổ 4, KP4A, P. Chánh Phú Hòa, BC.

Điện thoại:

Chúng tôi cùng tiến hành khảo sát, đánh giá các tiêu chí về mùi và côn trùng tại địa chỉ:

- Ông/bà đánh giá, nhận xét về mùi tại vị trí hiện tại như thế nào?

☐ Không có ☒ Hiếm khi ☐ Thỉnh thoảng ☐ Thường xuyên ☐ Luôn luôn

- Mật độ côn trùng (ruồi) tại vị trí hiện tại:

☒ Không có ☐ Rất ít ☐ Ít ☐ Hơi nhiều ☐ Nhiều

- Ý kiến khác: Lâu lâu có mùi rác, có mùi rác từ xe vận chuyển nhiều, mùi rác từ khu xử lý hiếm khi nghe

ĐD HỘ DÂN ĐƯỢC KHẢO SÁT

Nguyễn Văn Hai

ĐD CN XỬ LÝ CHẤT THẢI

CHI NHÁNH XỬ LÝ CHẤT THẢI
NM XỬ LÝ CHẤT THẢI SINH HOẠT

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

M01-QT32/XLCT

PHIẾU KHẢO SÁT, ĐÁNH GIÁ
(V/v: Hiệu quả khử mùi và xử lý côn trùng tại Khu liên hợp Xử lý chất thải Nam Bình Dương)

Hôm nay, vào lúc ..10..giờ..15..phút ngày..31./..08../..2022

Chúng tôi gồm:

1. Ông/bà: Đinh Thị Thanh Loan
   Đại diện cho: Chi nhánh Xử lý chất thải
   Địa chỉ: Khu phố 1B, phường Chánh Phú Hòa, TX. Bến Cát, tỉnh Bình Dương
   Điện thoại: 0274.354.906
2. Ông/bà: Nguyễn Thị Thùy Nương
   Đại diện cho:
   Địa chỉ: Tổ 4, KP1A, P. Chánh Phú Hòa, BC.
   Điện thoại:

Chúng tôi cùng tiến hành khảo sát, đánh giá các tiêu chí về mùi và côn trùng tại địa chỉ:

- Ông/bà đánh giá, nhận xét về mùi tại vị trí hiện tại như thế nào?

☐ Không có ☑ Hiếm khi ☐ Thỉnh thoảng ☐ Thường xuyên ☐ Luôn luôn

- Mật độ côn trùng (ruồi) tại vị trí hiện tại:

☐ Không có ☐ Rất ít ☑ Ít ☐ Hơi nhiều ☐ Nhiều

- Ý kiến khác: Hiếm khi có mùi xác thối bốc lên không có mùi xác phát sinh

ĐD HỘ DÂN ĐƯỢC KHẢO SÁT **ĐD CN XỬ LÝ CHẤT THẢI**

Nguyễn Thị Thùy Nương

Loan

CHI NHÁNH XỬ LÝ CHẤT THẢI
NM XỬ LÝ CHẤT THẢI SINH HOẠT

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

M.S.C.N: 3700145694-808-C.T.C.P
CHI NHÁNH XỬ LÝ CHẤT THẢI CÔNG TY CỔ PHẦN NƯỚC-MÔI TRƯỜNG BÌNH DƯƠNG
TX. BẾN CÁT - T. BÌNH DƯƠNG

M01-QT32/XLCT

PHIẾU KHẢO SÁT, ĐÁNH GIÁ
(V/v: Hiệu quả khử mùi và xử lý côn trùng tại Khu liên hợp Xử lý chất thải Nam Bình Dương)

Hôm nay, vào lúc ..09..giờ..35..phút ngày 24/.08./.2022

Chúng tôi gồm:

1. Ông/bà: Đinh Thị Thanh Loan

   Đại diện cho: Chi nhánh Xử lý chất thải

   Địa chỉ: Khu phố 1B, phường Chánh Phú Hòa, TX. Bến Cát, tỉnh Bình Dương

   Điện thoại: 0274.354.906

2. Ông/bà: Trần Thị Tiến

   Đại diện cho:

   Địa chỉ: 114 tổ 4, Khu phố 1A, Chánh Phú Hòa, BC

   Điện thoại:

Chúng tôi cùng tiến hành khảo sát, đánh giá các tiêu chí về mùi và côn trùng tại địa chỉ:

- Ông/bà đánh giá, nhận xét về mùi tại vị trí hiện tại như thế nào?

☐ Không có ☒ Hiếm khi ☐ Thỉnh thoảng ☐ Thường xuyên ☐ Luôn luôn

- Mật độ côn trùng (ruồi) tại vị trí hiện tại:

☒ Không có ☐ Rất ít ☐ Ít ☐ Hơi nhiều ☐ Nhiều

- Ý kiến khác: Lâu lâu có mùi nặc vào buổi chiều, thời gian ngắn thỉnh thoảng có mùi nặc phát sinh

ĐD HỘ DÂN ĐƯỢC KHẢO SÁT **ĐD CN XỬ LÝ CHẤT THẢI**

Trần Thị Tiến

CHI NHÁNH XỬ LÝ CHẤT THẢI
NM XỬ LÝ CHẤT THẢI SINH HOẠT

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

CHI NHÁNH XỬ LÝ CHẤT THẢI CÔNG TY CỔ PHẦN NHỰA-MÔI TRƯỜNG BÌNH DƯƠNG TX. BẾN CÁT-T. BÌNH DƯƠNG

M01-QT32/XLCT

PHIẾU KHẢO SÁT, ĐÁNH GIÁ
(V/v: Hiệu quả khử mùi và xử lý côn trùng tại Khu liên hợp Xử lý chất thải Nam Bình Dương)

Hôm nay, vào lúc ..09..giờ..40.phút ngày..31/..08./2022

Chúng tôi gồm:

1. Ông/bà: Đinh Thị Thanh Loan
   Đại diện cho: Chi nhánh Xử lý chất thải
   Địa chỉ: Khu phố 1B, phường Chánh Phú Hòa, TX. Bến Cát, tỉnh Bình Dương
   Điện thoại: 0274.354.906
2. Ông/bà: Nguyễn Thị Thanh Hoa
   Đại diện cho:
   Địa chỉ: 121/5 4KP1A, Chánh Phú Hoà, BC
   Điện thoại:

Chúng tôi cùng tiến hành khảo sát, đánh giá các tiêu chí về mùi và côn trùng tại địa chỉ:

- Ông/bà đánh giá, nhận xét về mùi tại vị trí hiện tại như thế nào?

☐ Không có ☒ Hiếm khi ☐ Thỉnh thoảng ☐ Thường xuyên ☐ Luôn luôn

- Mật độ côn trùng (ruồi) tại vị trí hiện tại:

☒ Không có ☐ Rất ít ☐ Ít ☐ Hơi nhiều ☐ Nhiều

- Ý kiến khác: Hiện khi có mưa nắng phát sinh khói gió gần đây thấy công ty xử lý tốt hơn những năm trước
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ĐD HỘ DÂN ĐƯỢC KHẢO SÁT **ĐD CN XỬ LÝ CHẤT THẢI**

Hoa

Nguyễn Thị Thanh Hoa

Loan

CHI NHÁNH XỬ LÝ CHẤT THẢI
NM XỬ LÝ CHẤT THẢI SINH HOẠT

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

CHI NHÁNH XỬ LÝ CHẤT THẢI CÔNG TY CỔ PHẦN NƯỚC-MÔI TRƯỜNG BÌNH DƯƠNG

M01-QT32/XLCT

PHIẾU KHẢO SÁT, ĐÁNH GIÁ
(V/v: Hiệu quả khử mùi và xử lý côn trùng tại Khu liên hợp Xử lý chất thải Nam Bình Dương)

Hôm nay, vào lúc ..10..giờ..00..phút ngày 03../08../..2022

Chúng tôi gồm:

1. Ông/bà: Đinh Thị Thanh Loan

   Đại diện cho: Chi nhánh Xử lý chất thải

   Địa chỉ: Khu phố 1B, phường Chánh Phú Hòa, TX. Bến Cát, tỉnh Bình Dương

   Điện thoại: 0274.354.906

2. Ông/bà: Nguyễn Thanh Vàng

   Đại diện cho:

   Địa chỉ: Tổ 14, Ấp Bến Tường, Lai Thiêu, Bàu Bàng

   Điện thoại:

Chúng tôi cùng tiến hành khảo sát, đánh giá các tiêu chí về mùi và côn trùng tại địa chỉ:

- Ông/bà đánh giá, nhận xét về mùi tại vị trí hiện tại như thế nào?

☐ Không có ☐ Hiếm khi ☒ Thỉnh thoảng ☐ Thường xuyên ☐ Luôn luôn

- Mật độ côn trùng (ruồi) tại vị trí hiện tại:

☒ Không có ☐ Rất ít ☐ Ít ☐ Hơi nhiều ☐ Nhiều

- Ý kiến khác:....Có mùi nhẹ, không khó chịu, thỉnh thoảng mới có, không có mùi nặng.....
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ĐD HỘ DÂN ĐƯỢC KHẢO SÁT **ĐD CN XỬ LÝ CHẤT THẢI**

Vang

Văn Thanh Vàng

Loan

CHI NHÁNH XỬ LÝ CHẤT THẢI
NM XỬ LÝ CHẤT THẢI SINH HOẠT

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

M.S.C.N: 3700145694-906-C.T.C.P
CHI NHÁNH XỬ LÝ CHẤT THẢI CÔNG TY CỔ PHẦN NƯỚC-MÔI TRƯỜNG BÌNH DƯƠNG
TX. BẾN CÁT-T. BÌNH DƯƠNG

M01-QT32/XLCT

PHIẾU KHẢO SÁT, ĐÁNH GIÁ
(V/v: Hiệu quả khử mùi và xử lý côn trùng tại Khu liên hợp Xử lý chất thải Nam Bình Dương)

Hôm nay, vào lúc ..10..giờ..20..phút ngày..9../..12../..2022..

Chúng tôi gồm:

1. Ông/bà: Đinh Thị Thanh loan
   Đại diện cho: Chi nhánh Xử lý chất thải
   Địa chỉ: Khu phố 1B, phường Chánh Phú Hòa, TX. Bến Cát, tỉnh Bình Dương
   Điện thoại: 0274.354.906
2. Ông/bà: Trương Thị Ngọc Hân
   Đại diện cho:
   Địa chỉ: Đường 62 (Mỹ phước - Bàu Bàng)
   Điện thoại:

Chúng tôi cùng tiến hành khảo sát, đánh giá các tiêu chí về mùi và côn trùng tại địa chỉ:

- Ông/bà đánh giá, nhận xét về mùi tại vị trí hiện tại như thế nào?

☐ Không có ☒ Hiếm khi ☐ Thỉnh thoảng ☐ Thường xuyên ☐ Luôn luôn

- Mật độ côn trùng (ruồi) tại vị trí hiện tại:

☒ Không có ☐ Rất ít ☐ Ít ☐ Hơi nhiều ☐ Nhiều

- Ý kiến khác:....Có mùi nặc nồng giác chiều khoảng 16-18h thứ không thường xuyên lắm lâu mới có mùi nặc phát sinh.....
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ĐD HỘ DÂN ĐƯỢC KHẢO SÁT **ĐD CN XỬ LÝ CHẤT THẢI**

Trương Thị Ngọc Hân

CHI NHÁNH XỬ LÝ CHẤT THẢI
NM XỬ LÝ CHẤT THẢI SINH HOẠT

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

CHI NHÁNH XỬ LÝ CHẤT THẢI CÔNG TY CỔ PHẦN NƯỚC-MÔI TRƯỜNG BÌNH DƯƠNG TX. BẾN CÁT-T. BÌNH DƯƠNG

M01-QT32/XLCT

PHIẾU KHẢO SÁT, ĐÁNH GIÁ
(V/v: Hiệu quả khử mùi và xử lý côn trùng tại Khu liên hợp Xử lý chất thải Nam Bình Dương)

Hôm nay, vào lúc ..09..giờ..00..phút ngày..10../..8../2022

Chúng tôi gồm:

1. Ông/bà: Đỗ Thị Thanh Loan

   Đại diện cho: Chi nhánh Xử lý chất thải

   Địa chỉ: Khu phố 1B, phường Chánh Phú Hòa, TX. Bến Cát, tỉnh Bình Dương

   Điện thoại: 0274.354.906

2. Ông/bà: Lữ Trung Nhịp

   Đại diện cho:

   Địa chỉ: 63, Tổ 4, KP4, P. Chánh Phú Hòa, BC, BD

   Điện thoại:

Chúng tôi cùng tiến hành khảo sát, đánh giá các tiêu chí về mùi và côn trùng tại địa chỉ:

- Ông/bà đánh giá, nhận xét về mùi tại vị trí hiện tại như thế nào?

☐ Không có ☒ Hiếm khi ☐ Thỉnh thoảng ☐ Thường xuyên ☐ Luôn luôn

- Mật độ côn trùng (ruồi) tại vị trí hiện tại:

☑ Không có ☐ Rất ít ☐ Ít ☐ Hơi nhiều ☐ Nhiều

- Ý kiến khác: Có mùi giấc khuya thỉnh thoảng thường xuyên, lâu lâu mới có mùi nặng phát sinh, thời gian gần đây xử lý mùi tốt hơn.....
.....
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.....

ĐD HỘ DÂN ĐƯỢC KHẢO SÁT **ĐD CN XỬ LÝ CHẤT THẢI**

Nhịp

Lữ Trung Nhịp

Loan

CHI NHÁNH XỬ LÝ CHẤT THẢI
NM XỬ LÝ CHẤT THẢI SINH HOẠT

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

M01-QT32/XLCT

PHIẾU KHẢO SÁT, ĐÁNH GIÁ
(V/v: Hiệu quả khử mùi và xử lý côn trùng tại Khu liên hợp Xử lý chất thải Nam Bình Dương)

Hôm nay, vào lúc ..10..giờ..05..phút ngày 17./08../2022

Chúng tôi gồm:

1. Ông/bà: Đinh Thị Thanh Vân
   Đại diện cho: Chi nhánh Xử lý chất thải
   Địa chỉ: Khu phố 1B, phường Chánh Phú Hòa, TX. Bến Cát, tỉnh Bình Dương
   Điện thoại: 0274.354.906
2. Ông/bà: Trương Thị Định.
   Đại diện cho:
   Địa chỉ: 504, Tổ 14, ấp Bến Đồng, Bàu Bàng, BD.
   Điện thoại:

Chúng tôi cùng tiến hành khảo sát, đánh giá các tiêu chí về mùi và côn trùng tại địa chỉ:

- Ông/bà đánh giá, nhận xét về mùi tại vị trí hiện tại như thế nào?

☐ Không có ☑ Hiếm khi ☐ Thỉnh thoảng ☐ Thường xuyên ☐ Luôn luôn

- Mật độ côn trùng (ruồi) tại vị trí hiện tại:

☒ Không có ☐ Rất ít ☐ Ít ☐ Hơi nhiều ☐ Nhiều

- Ý kiến khác: Lâu lâu có mùi xác giác chiều, lúc trời mưa thì hết nắng nóng không có mùi xác.

ĐD HỘ DÂN ĐƯỢC KHẢO SÁT

Định

Trương Thị Định.

ĐD CN XỬ LÝ CHẤT THẢI

Vân

CHI NHÁNH XỬ LÝ CHẤT THẢI
NM XỬ LÝ CHẤT THẢI SINH HOẠT

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

M01-QT32/XLCT

PHIẾU KHẢO SÁT, ĐÁNH GIÁ
(V/v: Hiệu quả khử mùi và xử lý côn trùng tại Khu liên hợp Xử lý chất thải Nam Bình Dương)

Hôm nay, vào lúc ..09..giờ..35..phút ngày 17/08../2022

Chúng tôi gồm:

1. Ông/bà: Đinh Thị Thanh Loan
   Đại diện cho: Chi nhánh Xử lý chất thải
   Địa chỉ: Khu phố 1B, phường Chánh Phú Hòa, TX. Bến Cát, tỉnh Bình Dương
   Điện thoại: 0274.354.906
2. Ông/bà: Lê Văn Hùng
   Đại diện cho:
   Địa chỉ: Số 174, Tổ 7, KP4, P. Chánh Phú Hòa, BC
   Điện thoại:

Chúng tôi cùng tiến hành khảo sát, đánh giá các tiêu chí về mùi và côn trùng tại địa chỉ:

- Ông/bà đánh giá, nhận xét về mùi tại vị trí hiện tại như thế nào?

☐ Không có ☑ Hiếm khi ☐ Thỉnh thoảng ☐ Thường xuyên ☐ Luôn luôn

- Mật độ côn trùng (ruồi) tại vị trí hiện tại:

☑ Không có ☐ Rất ít ☐ Ít ☐ Hơi nhiều ☐ Nhiều

- Ý kiến khác: Hiếm khi có mùi sắc
.....
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ĐD HỘ DÂN ĐƯỢC KHẢO SÁT

Hùng
Lê văn Hùng

ĐD CN XỬ LÝ CHẤT THẢI

Loan

ANNEX G: AIR QUALITY MONITORING

BIWASE's 8,400 kg/hour incinerator (part of the ADB-funded project) air emissions monitoring results from 22 February to 22 May 2021 and from 31 December 2021 to 2 June 2022 were provided. A comparison of the incinerator's performance against international and Viet Nam national air quality standards for waste management facilities (Table 1) showed that there were some exceedances of the EU Standard (with its corresponding time average values) and the local regulations (spot values are used), as indicated by the red font in the table. When compared to the EU standards, it is noted that the EU standards are generally more stringent than the Vietnamese standards even though some parameters are not comparable (i.e. the EU uses time average standards while Vietnam standards are for spot samples rather than time averages). Based on available information, there does not appear to be exceedance of the Japanese Standard (with its corresponding time average values where available).

Table 2 provides a comparison of monitored ambient air quality around the Site against WHO ambient air quality guidelines and Viet Nam national air quality standards. All the readings for 2021 were within Viet Nam's national standards and within the comparable WHO guidelines (i.e. the NOx results were within the 1-hour average guideline value).

TABLE 1 COMPARISON OF BIWASE 8,400 KG/HOUR INCINERATOR PERFORMANCE AGAINST INTERNATIONAL AND VIET NAM NATIONAL AIR QUALITY STANDARDS FOR WASTE MANAGEMENT FACILITIES

PARAMETER	JS[1]	EU STANDARD[2]	USEPA[3]	VIET NAM STANDARD - QCVN 30: 2012/BTNMT[4]	VIET NAM STANDARD - QCVN 02: 2012/BTNMT[5]	VIET NAM STANDARD - QCVN 19: 2009/BTNMT[6]	VIET NAM STANDARD - QCVN 61: 2016/BTNMT[7]	MONITORING RESULTS FROM 22 FEB – 22 MAY 2021 (24-HR AVERAGE)	MONITORING RESULTS FROM 31 DEC 2021 TO 02 JUN 2022		
									AVERAGE (BASED ON RESPECTIVE AVERAGING PERIODS)	MAXIMUM INSTANTANEOUS VALUES[8]	MINIMUM INSTANTANEOUS VALUES
Total Suspended Particulates (TSP)	-	-	20 mg/dscm *(averaging period not specified)*	-	-	-	-	-	-	-	-
(a) 1-hour average	24 mg/dscm[9] (Average over three 1-hour minimum runs)	-		-	-	-	-	-	-	14.8 mg/Nm^3	-	-
(b) 24-hour average	-	10 mg/m^3		-	-	-	-	-	22.1 mg/Nm^3	16.1 mg/Nm^3	-	-
(c) Spot measurements	-	-		-	100 mg/m^3	150 mg/m^3	144 mg/Nm^3	100 mg/Nm^3	-	-	9,160 mg/Nm^3	0
Sulphur Dioxide (SO_2)	-	-	30 ppmv (equivalent to 78.6 mg/m^3) (or 80% reduction)[a] *(averaging period not specified)*	-	-	-	-	-	-		-	-
(a) 1-hour average	80% reduction or 30 ppmv[9] (equivalent to 78.6 mg/m^3)	-		-	-	-	-	-	-	5.1 mg/Nm^3	-	-
(b) 24-hour average	-	50 mg/m^3		-	-	-	-	-	<26.2 mg/Nm^3	8.5 mg/Nm^3	-	-
(c) Spot measurements	-	-		-	250 mg/m^3	300 mg/m^3	360 mg/Nm^3	250 mg/Nm^3	-	-	503 mg/Nm^3	0

PARAMETER	JS[1]	EU STANDARD[2]	USEPA[3]	VIET NAM STANDARD - QCVN 30: 2012/BTNMT[4]	VIET NAM STANDARD - QCVN 02: 2012/BTNMT[5]	VIET NAM STANDARD - QCVN 19: 2009/BTNMT[6]	VIET NAM STANDARD - QCVN 61: 2016/BTNMT[7]	MONITORING RESULTS FROM 22 FEB – 22 MAY 2021 (24-HR AVERAGE)	MONITORING RESULTS FROM 31 DEC 2021 TO 02 JUN 2022			
									AVERAGE (BASED ON RESPECTIVE AVERAGING PERIODS)		MAXIMUM INSTANTANEOUS VALUES[8]	MINIMUM INSTANTANEOUS VALUES
Oxides of Nitrogen (NO_x)	250 ppm[10] (equivalent to 470.5 mg/m^3) *(averaging period not specified)*	-	-	-	-	-	-	-	-		-	-
(a) 24-hour average	-	200-400 mg/m^3		150 ppmv (equivalent to 282.3 mg/m^3)	-	-	-	-	142.5 mg/Nm^3	79.0 mg/Nm^3	-	-
(b) Spot measurements	-	-		-	500 mg/m^3	300 mg/m^3	612 mg/Nm^3	500 mg/Nm^3	-	-	10,204 mg/Nm^3	0
Opacity	10% (6-minute average)[9]	n/a	0.1	-	-	-	-	-	-		-	-
Hydrogen Chloride (HCL)	-	-	25 ppmv (equivalent to 37.3 mg/m^3) (or 95 reduction)[a] *(averaging period not specified)*	-	-	-	-	-	-		-	-
(a) 1-hour average	95% reduction or 25 ppmv[9] (equivalent to 37.3 mg/m^3) (Average over three 1-hr minimum runs)	-		-	-	-	-	-	-	-	-	-
(b) 24-hour average	-	10 mg/m^3		-	-	-	-	-	<0.1 mg/Nm^3	-	-	-
(c) Spot measurements	-	-		-	50 mg/m^3	50 mg/m^3	-	50 mg/Nm^3	-	-	-	-
Dioxins and Furans	0.1 ngTEQ/Nm^3[11] *(averaging period not specified)*	-	13 ngTEQ/dscm (total mass) *(averaging period not specified)*	-	-	-	-	-	-		-	-
(a) 4-hour average	13 ng/dscm[9] (Average over three 4-hr runs)	-		-	-	-	-	-	-	-	-	-
(b) 6-8 hour average	-	0.1 ng TEQ/m^3		-	-	-	-	-	0.24 ng TEQ/m^3	-	-	-
(c) Spot measurements	-	-		-	0.6 ng TEQ /Nm^3	2.3 ng TEQ /Nm^3	-	0,6 ngTEQ/Nm^3	-	-	-	-
Cadmium (Cd)	0.02 mg/dscm[9] *(averaging period not specified)*	-	0.010 mg/dscm *(averaging period not specified)*	-	-	-	-	-	-		-	-
(a) 0.5-8-hour average	-	0.5-0.1 mg/m^3		-	-	-	-	-	<0.01 mg/Nm^3	-	-	-
(b) Spot measurements	-	-		-	0.16 mg/m^3	0.2 mg/m^3	-	0,16 mg/Nm^3	-	-	-	-
Carbon Monoxide (CO)												

PARAMETER	JS[1]	EU STANDARD[2]	USEPA[3]	VIET NAM STANDARD - QCVN 30: 2012/BTNMT[4]	VIET NAM STANDARD - QCVN 02: 2012/BTNMT[5]	VIET NAM STANDARD - QCVN 19: 2009/BTNMT[6]	VIET NAM STANDARD - QCVN 61: 2016/BTNMT[7]	MONITORING RESULTS FROM 22 FEB – 22 MAY 2021 (24-HR AVERAGE)	MONITORING RESULTS FROM 31 DEC 2021 TO 02 JUN 2022			
									AVERAGE (BASED ON RESPECTIVE AVERAGING PERIODS)		MAXIMUM INSTANTANEOUS VALUES[8]	MINIMUM INSTANTANEOUS VALUES
(a) 4-hour average	50 ppmv[9] (equivalent to 90.0 mg/m^3)			50 ppmv[b] (equivalent to 90.0 mg/m^3)	-	-	-	-	-	< 90.0 mg/Nm^3	-	-
(b) 24-hour average	-	50 mg/m^3		-	-	-	-	-	140.3 mg/Nm^3 (22 Feb to 7 May); <11.4 mg/Nm^3 (16-22 May)	4.5 mg/Nm^3	-	-
(c) Spot measurements	-	-		-	250 mg/m^3	200 mg/m^3	720 mg/Nm^3	250 mg/Nm^3	-	-	2,457 mg/Nm^3	0
Lead (Pb)	1.6 mg/dscm[9] *(averaging period not specified)*	Included as part of total metals (below)	0.140 mg/dscm *(averaging period not specified)*	-	-	-	-	-	-		-	-
(a) 0.5-8-hour average	-	-		-	-	-	-	-	<0.03 mg/Nm^3	-	-	-
(b) Spot measurements	-	-		-	1.2 mg/m^3	1.5 mg/m^3	-	1,2 mg/Nm^3	-	-	-	-
Mercury (Hg)	85% reduction or 0.080 mg/dscm[9, a] *(averaging period not specified)*	-	0.050 mg/dscm (or 85% reduction)[a] *(averaging period not specified)*	-	-	-	-	-	-		-	-
(a) 0.5-8-hour average	-	0.05 – 0.1 mg/m^3		-	-	-	-	-	<0.0005 mg/Nm^3	-	-	-
(b) Spot measurements	-	-		-	0.2 mg/m^3	0.5 mg/m^3	-	0,2 mg/Nm^3	-	-	-	-
Total Metals	n/a	0.5 mg/m^3 (0.5-8 hr average)	n/a	1.2 mg/m^3	-	-	-	-	-		-	-
Hydrogen Fluoride (HF)	n/a	1 mg/m^3	n/a	Not specified	Not specified	-	-	-	-		-	-

*Red fonts indicate an exceedance of the equivalent parameter under the respective standard.

Notes

[1] JS: Japan Environmental Governing Standards (JEGS) 2020, reference document used by RICARDO to cross-check against the Japanese Standards provided by ADB; accessible from https://govtribe.com/file/government-file/attach-4-jegs-2020-dot-pdf

[2] EU Standards: the most recent EU standard is EU Directive 2010/75/EU the Industrial Emissions Directive

[3] USEPA: US EPA Standard of Performance for Large Municipal Waste Combustors, 40 CFR Part, 60 Subpart Eb; all values corrected to 7% oxygen. Averaging periods are not specified except when indicated under the relevant averaging periods.

- a - Whichever is less stringent
- b- Depending on the type of unit; in this case based on modular starved air, and modular excess air, hence 50ppm (4-hr average) was selected. Note: mass burn waterwall, mass burn refractory, and circulating fluidized bed combustor - 100 ppm (4-hr average); mass burn mixed fuel fired combustor- 150 ppm (4-hr average); refuse derived fuel stocker, and spreader stocker coal/refuse- derived fuel mixed fuel-fired combustor-150 ppm (24-hr average)

mg/m3 = milligrams per cubic meter; mg/dscm = milligrams per dry standard cubic meter; ppmv = parts per million by volume; TEQ = Toxicity Equivalent Units

[4] QCVN 30: 2012/BTNMT: National Technical Regulation on Industrial Waste Incinerator issued by MONRE

[5] QCVN 02: 2012/BTNMT: National Technical Regulation on Solid Healthcare Waste Incinerator issued by MONRE

[6] QCVN 19: 2009/BTNMT: National Technical Regulation on Industrial Emission of Inorganic Substances and Dusts issued by MONRE

[7] QCVN 61: 2016/BTNMT: National Technical Regulation on Domestic Waste Incinerator issued by MONRE

Note that Vietnamese standards are for spot samples rather than time averages, except for the results from 31 Dec 2021 to 02 Jun 2022 which are based on continuous emissions monitoring.

[8] As waste is fed to the incinerator in batches and is not a continuous process in this case, there are some spikes in the data which could have happened during the combustion process and that explains the high readings for some parameters. The averaged results provide a more accurate representation of exceedances.

[9] Taken from Table 4.5 of JEGS 2020.

[10] Taken from Table 4.26 of JEGS 2020.

[11] Taken from Table 4.31 of JEGS 2020.

TABLE 2 COMPARISON OF MONITORED AMBIENT AIR QUALITY AROUND THE SITE[12] AGAINST WHO AMBIENT AIR QUALITY GUIDELINES AND VIET NAM NATIONAL AIR QUALITY STANDARDS

PARAMETER	WHO GUIDELINE VALUE (in µg/m^3)	VIET NAM STANDARDS (in µg/m^3)[13]	COMPLEX GATE AREA (in µg/m^3)		HOUSEHOLDS EAST OF THE COMPLEX (in µg/m^3)		HOUSEHOLDS SOUTH OF THE COMPLEX (in µg/m^3)		HOUSEHOLDS WEST OF THE COMPLEX (in µg/m^3)	
			02 JUN 2021	03 DEC 2021	02 JUN 2021	03 DEC 2021	02 JUN 2021	03 DEC 2021	02 JUN 2021	03 DEC 2021
Sulphur Dioxide (SO_2)	125 (interim target 1); 50 (interim target 2); 20 (guideline) (24-hr average) 500 (guideline) (10-minute average)	350 (1-hour average)	42	33	37	28	31	25	35	36
Nitrogen dioxide (NO_2)	40 (guideline) (1-year average) 200 (guideline) (1-hour average)	200 (1-hour average)	39	20	25	16	18	13	23	25
Total Suspended Particulates (TSP)	-	300 (1-hour average)	160	140	140	120	120	110	130	150
Particulate Matter (PM10)	70 (interim target 1); 50 (interim target 2); 30 (interim target 3); 20 (guideline) (1-year average) 150 (interim target 1); 100 (interim target 2); 75 (interim target 3); 50 (guideline) (24-hour average)	150 (24-hour average)	-	-	-	-	-	-	-	-
Particulate Matter (PM2.5)	35 (interim target 1); 25 (interim target 2); 15 (interim target 3); 10 (guideline) (1-year average) 75 (interim target 1); 50 (interim target 2); 37.5 (interim target 3); 25 (guideline) (24-hour average)	50 (24-hour average)	-	-	-	-	-	-	-	-
Ozone	160 (interim target 1); 100 (guideline) (8-hour daily maximum)	200	-	-	-	-	-	-	-	-
CO	-	30,000 (1-hour average)	2,240	2,230	2,010	2,010	1,860	1,640	1,980	2,190
H2S	-	42 (1-hour average)	< 4.7	< 4.7	< 4.7	< 4.7	< 4.7	< 4.7	< 4.7	< 4.7
NH3	-	200 (1-hour average)	< 6.7	< 6.7	< 6.7	< 6.7	< 6.7	< 6.7	< 6.7	< 6.7
CH3SH	-	50 (1-hour average)	< 4.8	< 4.8	< 4.8	< 4.8	< 4.8	< 4.8	< 4.8	< 4.8

Notes

[12] Monitored ambient air quality around the site are considered to be 1-hour average readings as they are monitored against the Viet Nam Standards.

[13] Viet Nam Standards:

- QCVN 05:2013/BTNMT: National technical regulations on ambient air quality
- QCVN 06:2009/BTNMT: National technical regulations on some hazardous substance in ambient air

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