

Environmental Monitoring Report

Semi-Annual Report
July–December 2021
January 2022

Cambodia: Second Greater Mekong Subregion Tourism
Infrastructure for Inclusive Growth Project

CW 03: Kep Solid Waste Improvement Subproject (Kep Landfill
Improvements)

CW 01a: Kep-Angkol Coastal Road Improvement

CW 02a: Koh Tunsay Passenger Pier

Prepared by Ministry of Public Works and Transport for the Royal Government of Cambodia
and the Asian Development Bank.

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Semi-Annual Environmental Monitoring Report

CAMBODIA

Ministry of Tourism

49387-001

**CAM: Second Greater Mekong Subregion Tourism
Infrastructure for Inclusive Growth Project**

**CW 03: Kep Solid Waste Improvement Subproject (Kep
Landfill Improvements**

CW 01a: Kep-Angkol Coastal Road Improvement

CW 02a: Koh Tonsay Passenger Pier

Reporting Period: *July – December 2021*

Date: *January 2022*

SEMR Report Number: *4*

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1 ENVIRONMENTAL SAFEGUARDS SUMMARY

1. The Second Greater Mekong Subregion Tourism Infrastructure for Inclusive Economic Growth Project (TIIGP) will help transform secondary GMS central and southern corridor towns into economically inclusive, competitive tourism destinations by improving transport infrastructure, urban environmental services, and capacity to sustainably manage tourism growth. It will boost trade in services and deepen regional cooperation and integration in the GMS and Association of Southeast Asian Nations (ASEAN). About 97,000 residents are expected to directly benefit from climate-resilient infrastructure development and increased access to economic opportunities. Project investments are prioritized in the ASEAN Tourism Strategic Plan 2015-2025, GMS Tourism Sector Strategy 2016-2025, and national tourism strategies.

Table 1. Project Data

ADB Loan number:	Grant 0599-REG/ADB Loan 3701-CAM funded by Asian Development Bank
Project Title:	Second Greater Mekong Subregion Tourism Infrastructure for Inclusive Growth Project
Project Outputs	Output 1. Urban-rural access infrastructure and urban environmental services improved; Output 2. Capacity to implement ASEAN tourism standards strengthened; Output 3. Institutional capacity for tourism destination management and infrastructure O & M strengthened.
Beneficiary:	Royal Government of Cambodia
Executing Agency:	Ministry of Tourism Ministry of Economy and Finance
Implementing Agency:	Provincial Project Implementing Unit
Date of Effectiveness:	25 December 2018
Closing Date:	30 June 2025

Reference: Project Data Sheet (<https://www.adb.org/projects/49387-002/main#project-documents>)

2. The safeguards categorization for environment is B. IEEs and EMPs for each infrastructure subprojects have been prepared in compliance with the Governments' regulatory requirements and ADB's Safeguards Policy Statement (SPS, 2009).
3. The fourth Semi-annual Environment Monitoring Report (SEMR) covers the period of July to December 2021 for Second Greater Mekong Subregion Tourism Infrastructure for Inclusive Growth Project (Cambodia). The SEMR has been prepared to fulfill the safeguard policy requirement of ADB.
4. The SEMR is prepared by PMCES and checked by PMU/ Ministry of Public Works and Transport.

1.1 Summary of Project Progress

5. The following table gives a brief summary of the project progress for contract award, construction and key activities in this reporting period:

Table 2. Project Progress Summary

Safeguards Category	Environment	B	
Reporting Period:	July to December 2021	Date Last Report Issued:	SEMR July to December 2021 issued on January 2022
Contracts Awarded to Date:	CW 03 (Kep Landfill Improvements) MTA Construction Co., Ltd, 20 May 2020. Commenced on 24 May 2020. Original completion date: 20 Oct		

	<p>2021 (MPWT approved contract duration extension of 9.5 months – end date on 31 July 2022)</p> <p>CW 01a (Kep-Angkol Coastal Road Improvement). Kiri Dangrek Construction Co., Ltd and M.T.A Construction Co., Ltd (JV). Contract signed 27 December 2021. Contractual commencement date planned on 24 January 2022. Expected date of completion: 23 November 2023 (22 months from Commencement Date)</p> <p>CW 02a (Koh Tonsay Passenger Pier). Vimeanchey Group Co., Ltd. Contract signed 1 September 2021. Agreed Commenced on 25 November 2021. Expected completion date – 28 February 2023, 15 months, 450 days (start from the commencement date)</p>
<p>Construction Progress to Date:</p>	<p>As of December 2021 the physical construction progress is as follows:</p> <p>CW 03 (Kep Landfill Improvements) – The project was granted a contract duration extension of 9.5 months up to 31 July 2022, so it is not considered as delayed. The reasons for the extension are: a) works increased by about 42% with respect to original contract; b) the partial suspensions of the works included in the VO3, for which conditional approval by ADB was issued on 3 December 2021 but some items are still suspended, and c) due to COVID-19 restrictions, with precluded the hiring of more workers, as required by the works under way in the last period.</p> <p>CW 01a (Kep-Angkol Coastal Road Improvement) – the contract was signed on 27 December 2021 and the official commencement date is 24 January 2022. Therefore, no construction, but only preparatory activity was carried out within the reporting period such as: a) UXO Clearance has been received on 11 February 2022 and was shared by PMU to ADB on 16 February 2022; b) Revised CEMP was approved by PMCES on 27 January 2022 and shared with ADB on 13 February 2022; c) ADB NOL to start works on Resettlement free section was issued on 16 January 2022; d) detailed toposurvey and geotechnical investigations are ongoing on the resettlement free section</p> <p>CW 02a (Koh Tonsay Passenger Pier¹) – construction works started in 24 November 2021 after CEMP and UXO clearance have been approved by PMCES/ PMU (12 November 2021) and transmitted to ADB (on 13 November 2021). ADB NOL to start construction was issued on 19 November 2021. The following works were carried out during this reporting period:</p> <ul style="list-style-type: none"> - geotechnical investigations (excavated pits, two deep-boreholes with water pumping tests) - some land clearing and rubbing in the sites for: part of the walkway (180 m), on the areas for the toilet and showers, the water supply reservoir, the camp site; - built a rockfill-earthwork provisional landing facility to permit the approach to land of the barge for transportation of equipment and materials from the mainland
<p>Key Sub-project Activities in this Reporting Period:</p>	<p>CW 03 (Kep Landfill Improvements) July 2021</p> <ul style="list-style-type: none"> - Excavation work for HDPE Pipe Installation - Sand laying on cell area before HDPE liner

¹ The contract tracker adopted the English version of the name of the island (Rabbit Island) but all BD documents and other documents (i.e. BRP, Bid Documents, DED) use the khmer name (Koh Tonsay). The ADB-MEF-MOT agreed to use the Khmer name “Koh Tonsay” as the name of the sub-project.





	<ul style="list-style-type: none"> - Construction of Service and Administration Building: Column work and masonry work <p>August 2021</p> <ul style="list-style-type: none"> - Masonry and plastering work on service building and administration building - Sand, geotextile installation and HDPE liner laying in Cell #1 and #2 <p>September 2021</p> <ul style="list-style-type: none"> - Gravel laying in Cell #1, #2 - Precast R.C slab in bottom Cell #2 - Geotextile and HPDE installation in Cell #3 - Painting (interior and exterior), ceiling work and roof work for service and administration buildings <p>October and November 2021</p> <ul style="list-style-type: none"> - Preparatory earthworks & installation of a perimeter runoff interceptor drainage system - Placing of HEDP liner on the ponds of leachate treatment plant - Construction of materials recovery facility for waste separation and recycling - removal and disposal in the completed Cell1 of the wastes temporarily deposited in the area (wastes dumped in the borrow pit before the start of the project and the wastes produced in Kep and delivered to the construction site during the last 2 years) - Excavation of the ponds for the constructed wetlands, after the removal of the wastes. <p>December 2021</p> <ul style="list-style-type: none"> - Install precast concrete slab on bottom and slopes of Cell #3 - HDPE, geotextile installation and laying of gravel in Cell #4 - Construction of water control rooms for the Treatment and Wetland ponds - Health and Safety: Safety tools and safety facilities provided to workers and engineers, COVID-19 awareness and prevention program continued from previous period. <p>CW 01a (Kep-Angkol Coastal Road Improvement)</p> <ul style="list-style-type: none"> - UXO Clearance has been received on 13 February 2022 and was shared by PMU to ADB on 16 February 2022. - Revised draft of CEMP resubmitted to PMCES/PMU was approved on 27 January 2022. <p>CW 02a (Koh Tonsay Passenger Pier) – The Contract was signed on 01 September 2021 and the preliminary project activities in the reporting period were:</p> <ul style="list-style-type: none"> - CEMP was approved by PMCES/PMU on 2 November 2021 and transmitted to ADB on 2 November 2021. - The UXO clearance has been issued on 10 November 2021 and approved by PMCES/PMU on 13 November 2021. ADB NOL to start Construction was issued on 16 November 2021. - Geotechnical investigations in progress since December 2021. - Initial construction activities include land clearing and earthworks <p><u>Permits or Consents Issued:</u></p> <ul style="list-style-type: none"> - Environmental license for the Kep Landfill Subproject-CW03 issued by MOE on 10 April 2020. - Environmental license for Kep-Angkol Coastal Road Improvement - CW 01 issued on 1 Dec 2020 - Environmental license for Koh Tonsay Passenger Pier - CW02a issued on 30 May 2021.
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1.2 Summary of EMP Implementation

6. EMP implementation is summarised in the following points, for this reporting period:

a) CW 03 (Kep Landfill Improvements)

- Provision of first aid kit, COVID-19 rapid test kit, fire extinguishers
- Waste lubricants and oil are kept in and kept at a proper place. Fuel tank for storage was provided and the tank was installed in camp site over the concrete base slab can control fuel and lubricants spillage. Some used oil were re-used on the formworks of pre-cast works.
- Traffic signages were installed to ensure people's safety guidelines to the construction zones
- Provision of required personal protective equipment (PPE) to all the workers
- Dust control implemented. Water is sprayed by water truck if necessary to control dust in the construction area. Installation of geotextile, HDPE were done in all cells thus minimizing exposed soil.
- COVID-19 precautionary measures such as temperature were being implemented
- Air quality monitoring were conducted
- Noise and vibration levels sampling were conducted
- Surface and groundwater quality monitoring were conducted
- Solid and liquid wastes were properly managed and disposed
- Social safeguard monitoring for resettlement and indigenous peoples were implemented
- Campsite/Worker's Camp and associated facilities provided to workers.

	
<p>a. PMU and PIU site visit</p>	<p>b. Air quality, noise and vibration level monitoring in Damnak Chang Eu Village, Prey Thom Commune, Kep Province</p>
	
<p>c. Water sampling activities</p>	<p>d. Groundwater sampling activity</p>

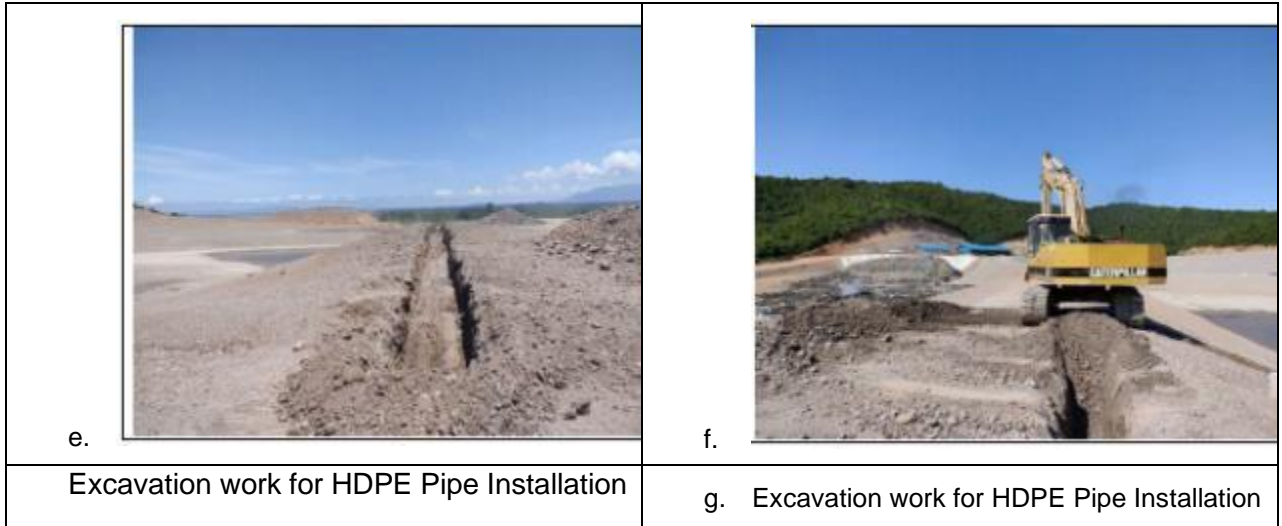


Figure 1. Kep CLF Project Site, July 2021



Figure 2. PMU and PIU site visit at Kep CLF Project Site, August 2021

<p>a. Installation of precast reinforced concrete slab in bottom Cell #2</p>	<p>b. Site visit by PMU and PIU</p>
<p>c. Overlaying of gravel</p>	<p>d. Installation of HDPE</p>
<p>a. Skimcoating, ceiling and roofing works of service and administrative building</p>	<p>b. Installation of geotextile in the Cells</p>

Figure 3. Kep CLF Project Site, September 2021



Figure 4. Kep CLF Project Site, October 2021



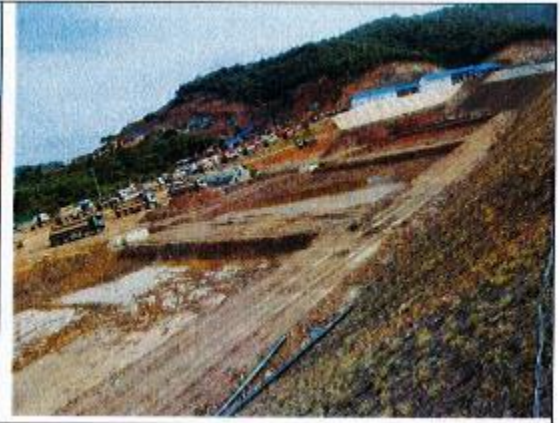
a. Temperature screening and COVID-19 rapid test kits



b. Site visit of ADB staff and engineers



c.



d. Construction of r.c. structures for Control Flow rooms and Excavation work for the wetlands



e. Used oil applied to paint forms for precast U-drain

Figure 5. Kep CLF Project Site, November 2021



a. geotextile and gravel laying in Cell 4



b. installation of HDPE in Cell 4



c. Protection of Cell bottom with concrete slab



d. excavation works at the treatment and wetland areas



e. Concrete pouring works for the foundation beams of the hazardous cell structure

Figure 6. Kep CLF Project Site, December 2021



a. Workers' Camp



b. Waste management at the camp site



c. Provision of first aid kit and tool box briefing



d. used oil for reuse to lubricate forms for precast slab and U-drain

Figure 7. Kep CLF Construction Associated Facilities, June 2021

- b) CW 01a (Kep-Angkol Coastal Road Improvement)
- the Revised CEMP by Kiri Dangrek Construction Co., LTD AND M.T.A Construction Co., LTD (JV) was approved by PMCES / PMU on 27 January 2022.
 - the official commencement date is 24 January 2022. No construction activities on site.
- c) CW 02a (Koh Tonsay Passenger Pier)
- CEMP approved by PMCES/ PMU on 12 November 2021 and transmitted to ADB on 13 November 2021.
 - UXO clearance carried out and clearance has been issued on 10 November and approved by PMCES/PMU on 13 November. ADB NOL to start Construction was issued on 16 November 2021.
 - Geotechnical investigations in progress since December 2021.
 - Establishment of camp site and associated areas.



Figure 8. Initial land clearing and earthworks in Koh Tonsay Passenger Pier – December 2021



UXO detection and clearing of mines and unexploded ordnance



UXO detection and clearing of mines and unexploded ordnance

Figure 9. UXO Detection activities for the Koh Tonsay Passenger Pier Subproject ,02 Nov 2021



Excavated pit, 1.5 m deep and Carry out Dynamic Cone Penetrometer text



Excavated pit, 1.5 m deep and Carry out Dynamic Cone Penetrometer text

Figure 10. Geotechnical Investigations for the Koh Tonsay Passenger Pier Subproject 27 Dec. 2021



Drilling of well no.01



Drilling of well no. 2

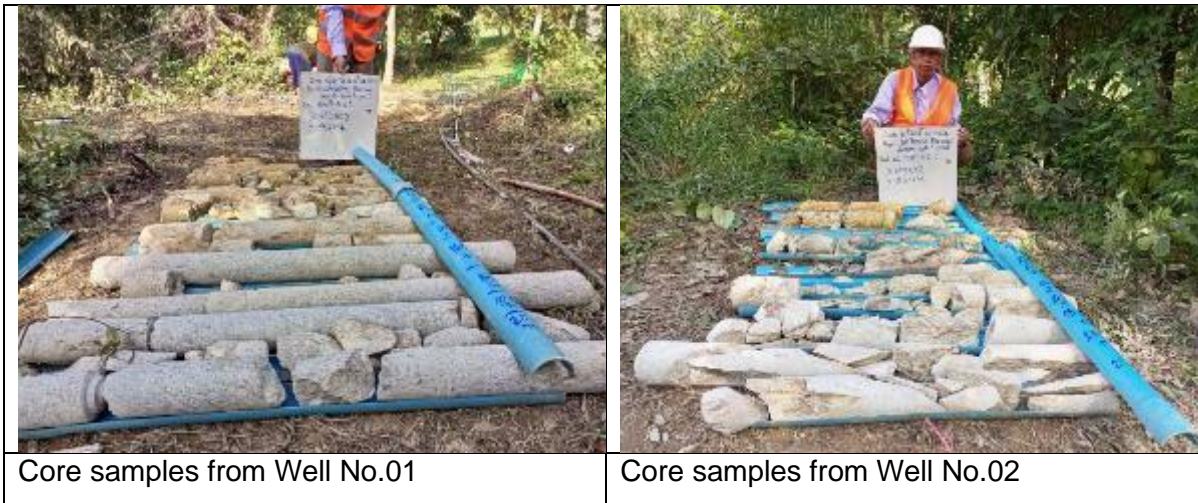


Figure 11. Geotechnical Investigations Drilling of 2 Boreholes Well 20 m deep

- a) To date there are no issues affecting project environmental performance.

1.3 Summary of EMP Monitoring

7. EMP monitoring for this reporting period is summarised in **Table 3**.

Table 3. Summary of Environmental Quality Monitoring July-December 2021

	CW 03 (Kep Landfill Improvements)		CW 01a (Kep-Angkol Coastal Road Improvement)		CW 02a (Koh Tonsay Passenger Pier)	
	EMP	Actual Jul-Dec 2021	EMP	Actual Jul-Dec 2021	EMP	Actual Jul-Dec 2021
Noise Level		July 2021		none		none
Air quality		July 2021		none		none
Surface water		July 2021		none		none

1.3.1 CW 03 (Kep Landfill Improvements)

8. The contractor has achieved progress of 96%. Main construction works this reporting period July-December 2021 included installation of HDPE, overlaying of gravel and installation of concrete slabs in the cells; construction works for drainage system and finishing works of associated building infrastructure of the landfill.

- Collection and analyses of water and air samples in July 2021 for Kep Landfill. Detailed discussion of laboratory results is presented in Section 4.1 of this report.
- Noise level laboratory results showed that noise level elevations were reported slightly above the standard from 11:00 pm to 3:00 am. The construction site is far from residential area. No grievance was received in this regard.
- The surface water quality parameters with noted exceedances in July 2021 sample collection include TSS, total nitrogen, phosphorous, COD and total coliform (46,000 MPN/100ml) were noted. The pH measure is slightly below acceptable value. All other related parameters were reported within the applicable set standards. It should be noted that the area is an existing open dump site prior to the start of construction. This may have contributed to these elevated measures. It should be noted that MTA

Construction Co., Ltd provided sanitation facilities for their workers and staff in all construction site and work camps. No grievance cases concerning surface water quality impacts were reported during this period.

- The groundwater quality parameters with noted exceedances include turbidity, aluminum and total iron; EC is below standard value; all other related parameters were reported within the applicable set standards. Exceedances in turbidity, aluminum and total iron may be attributed to natural factors, as reported in 2018 DED Interim Report, including topographic position and the mineral composition of underlying geology.
- Elevated concentration of iron in groundwater samples was already reported during baseline data collection in 2018. It may be one of the naturally occurring metals that are dissolved and it was detected in elevated concentration in the groundwater sample. It should be well noted that the groundwater is not used in drinking or domestic use in the project area. No grievance cases concerning groundwater quality impacts were reported during this period.
- Result shows that all parameters were within the air quality national standards. No significant environmental impacts attributed to the works were noted during the sampling. No grievance cases concerning air quality impacts were reported during this period.
- Number of Monitoring Visits to Construction Site and wider area presented in **Table 4**, **Table 5** and **Table 6**. The number of monitoring visits were limited due to COVID-19 related travel restrictions.

Table 4. CW03 (Kep Landfill Improvement) Site Visits in 2021

Entity	Date of site visit/ monitoring	Concerns
PMU/ PIU/ Engineer	09 Feb 2021 25 May 2021 24 July 2021 20 Aug 2021 20 Sept. 2021 23 Nov. 2021	Project Progress
PMCES Team leader and Environmental Specialists	14 July .2021 26 Aug 2021 18 Sept 2021 30 Sept. 2021 28 Oct 2021 23 Nov 2021 06 Dec 2021	Project Progress and Environmental Monitoring a) The management is satisfactorily implementing applicable subplans. b) Further suggested activities to be done were: increase number of road signals for traffic safety; continue strict implementation of 'No hunting' policy; taking groundwater sampling at the project site in July 2021; strict housekeeping; and continue efforts to control spread of COVID-19 cases in the project site.
Provincial Governor and Authority	25 March 2021	Visit new access road to landfill site

1.3.2 CW 01a (Kep-Angkol Coastal Road Improvement)

- Preparation of CEMP is in progress

- the official commencement date is 24 January 2022. No construction activities on site.

Table 5. CW01a (Kep Angkol Coastal Road Improvement) Site Visits in 2021

Entity	Date of site visit/ monitoring	Concerns
PMU/ PIU/ Engineer	23 Nov. 2021	Site inspection with CAM safeguards in order to check status of supposed 269 overlap in Angkol and related issues on Resettlement.

1.3.3 CW 02a (Koh Tonsay Passenger Pier)

- CEMP was approved by PMCES (12 November 2021) and transmitted to/cleared by ADB (13 November 2021)
- Geotechnical investigations carried out.
- Establishment of camp site and associated areas.
- Number of Monitoring Visits to Construction Site and wider area presented in **Table 6**. The number of monitoring visits were limited due to COVID-19 related travel restrictions

Table 6. CW 02a (Koh Tonsay Passenger Pier) Site Visits in 2021

Entity	Date of site visit/ monitoring	Concerns
PMU/ PIU/ Engineer	20 Aug 2021 20 Sept 2021 23 Nov 2021	Site inspection with Vimeanchey Group Co., Ltd.
PMCES Team leader and Environmental Specialists	26 Aug 2021 18 Sept 2021 30 Sept 2021 28 Oct 2021 23 Nov 2021 06 Dec 2021	Site inspection with Vimeanchey Group Co., Ltd.

1.4 Summary of Complaints, Issues and Corrective Action

No grievance case was reported in the period of July to December 2021.

Table 7. Summary of Issues, Grievances and Corrective Actions

Subproject	Issues	Grievances	Corrective Actions
CW 03 (Kep Landfill Improvements)	None	None	None
CW 01a (Kep-Angkol Coastal Road Improvement)	None	None	None
CW 02a (Koh Tonsay Passenger Pier)	Vimeanchey Group Co., Ltd has NOT submitted monthly self-monitoring	None	Issue flagged by PMCES in various meetings with the contractor

	report to PMU/PMCES for the period 2021 Dec to present.		
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2 SAFEGUARDS STAFF, TRAINING AND DOCUMENTATION

2.1 Implementation Arrangements

9. The EMP defines the Environmental Safeguards roles and responsibilities. The roles are required to be filled in order to meet the EMP requirements. The following table gives the status of the key roles for EMP implementation:

Table 8. Status of Environmental Safeguard Roles

Safeguards Role	Status & Comment			
PMU- Environmental Control Officer (ECO)	Date Started:	11-May-2020	Full Time/ Part Time	PT
	Comment	Mr. Penh Socheat (PMU)		
PIU Environmental And Social Safeguards Staff]	Date Started:	12 March 2020	Full Time/ Part Time	PT
	Comment	Chhun ChanVan Thon		
PIU GRM Focal Point	Date Started:	12 March 2020	Full Time/ Part Time	PT
	Comment	Ken Sopheak		
PMCES international and national environmental specialists for the EMP	Date Started:	25 Aug-2019	Full Time/ Part Time	PT
	Comment	Rustica Romero mobilized in Q1 2021; Mr. Mao Van Cchan (NES up to 15 April 2020; replaced by Mr. Chheang You from 05- May 2020)		
Environmental Monitoring Institute (EMI)	Date Started:	To Be Appointed (TBA)	Part Time	TBA
	Comment	Not yet hired by the Consultant during the report period		
Contractor of CW 03 (Kep Landfill Improvements) Environment Health & safety Staff	Date Started:	Feb 2021	Part Time	PT
	Comment	Mr Song Kim Chhuon - The Environment and Health and Safety Officer (EHSO) for MTA was mobilized in February 2021.		
Contractor of CW 01a (Kep-Angkol Coastal Road Improvement) Environment Health & safety Staff	Date Started:	Jan 2022	Part Time	PT
	Comment	Mr Orng Leng Meng, Environmentalist		
Contractor of CW 02a (Koh Tonsay Passenger Pier) Environment Health & safety Staff	Date Started:	April 2022	Part Time	PT
	Comment	Mr. Song Kimchhuon		

2.2 Training & Capacity Building

10. No formal environmental safeguards training courses that have been completed during this reporting period due to COVID-19 restrictions. The regular toolbox meeting carried out at the construction site included discussions on environment, health and safety, potential hazards and

measures that needed to be implemented. Training on HIV/ AIDS, Safety and Health Training was carried out on 01 February 2021 in Damnak Chong Ar Village by Ministry of Tourism and attended by workers and staff of M.T.A Construction Co., Ltd. The raining was conducted by Mr. Sophanna Chap, National Gender Specialist of MOT-CPU (See details in Annex 5. CW03 Training Report 2022 Feb 01).



Figure 12. Toolbox meeting/ briefing at the project site

Table 9. Overview of Environmental Safeguards Training Delivered and Planned

Subproject	Training Subject	Delivered Jul-Dec 2021	Planned for Jan-Dec 2021
CW 03 (Kep Landfill Improvements)	<ol style="list-style-type: none"> 1. EMP Implementation Overview 2. Grievance Redress Mechanism 3. Mitigation measures and Pollution Control 4. Environmental Monitoring 5. COVID-19 Measures 	<ol style="list-style-type: none"> 1. - 2. - 3. - 4. - 5. By MOT², 01 February 2021 	<ol style="list-style-type: none"> 1. - 2. - 3. - 4. - 5. -
CW 01a (Kep-Angkol Coastal Road Improvement)	<ol style="list-style-type: none"> 1. EMP Implementation Overview 2. Grievance Redress Mechanism 3. Mitigation measures and Pollution Control 4. Environmental Monitoring 5. COVID-19 Measures 	<ol style="list-style-type: none"> 1. - 2. - 3. - 4. - 5. - 	<ol style="list-style-type: none"> 1. Apr 2022 2. Apr 2022 3. Apr 2022 4. Apr 2022 5. Apr 2022
CW 02a (Koh Tonsay Passenger Pier)	<ol style="list-style-type: none"> 1. EMP Implementation Overview 2. Grievance Redress Mechanism 3. Mitigation measures and Pollution Control 4. Environmental Monitoring 5. COVID-19 Measures 	<ol style="list-style-type: none"> 1. - 2. - 3. - 4. - 5. - 	<ol style="list-style-type: none"> 1. Apr 2022 2. Apr 2022 3. Apr 2022 4. Apr 2022 5. Apr 2022

2.3 ADB Clearances

11. The following tables **Error! Reference source not found.** and **Error! Reference source not found.** present the information on the status of the safeguards documents of the three (3) subprojects.

Table 10. Status of Environmental Safeguard Documents for CW 03 (Kep Landfill Improvement subproject)

Safeguards Documents/ UXO clearances	Update Issued (Latest Version)	Submitted to MoE	Submitted to ADB
IEE updated, updated based upon the Revised Leachate Treatment Plant Design of Kep Solid Waste Improvement Subproject – July 2021 (https://www.adb.org/projects/documents/cam-49387-002-iee-5)	July 2021	July 2021	July 2021
IEE updated, updated based upon the Revised Detailed Design of Kep Solid Waste Improvement Subproject. April 2021			

² The training on COVID and HIV held in in Kep Landfill on 01 February 2021 was carried out by Mr. Sophanna Chap, National Gender Specialist of MOT.

Safeguards Documents/ UXO clearances	Update Issued (Latest Version)	Submitted to MoE	Submitted to ADB
<p>(https://www.adb.org/projects/documents/cam-49387-002-iee-4)</p> <p>IEE updated, update based on the DED of Kep Solid Waste Management Improvements subproject. The updated IEE includes all details, environmental baseline data, Public Consultation reports and other requirements contained in the IESIA, May 2020 (https://www.adb.org/projects/documents/cam-49387-002-iee-1)</p> <p>IEE, January 2018 (https://www.adb.org/projects/documents/cam-49387-002-iee-0)</p>			
<p>EMP Subproject 1 (Kep Landfill Improvements CW03)</p> <p>EMP, May 2020 updated based on DED of Kep Solid Waste Management Improvements subproject (https://www.adb.org/projects/documents/cam-49387-002-emp-1)</p> <p>EMP for Kep Subproject. January 2018 (draft) (https://www.adb.org/projects/documents/cam-49387-002-emp-0)</p>	May 2020	updated EMP is included in the updated IEE	04 May 2020
<p>UXO Clearance</p> <p>UXO clearance certificate issued for this project by NPMEC, EOD Unit 213 and was signed by MG Mey Sophea on 18 June 2020</p>	18 June 2020	June 2020	June 2020

Table 11. Status of Environmental Safeguard Documents for CW 01a (Kep-Angkol Coastal Road Improvement) and CW 02a (Koh Tonsay Passenger Pier)

Safeguards Documents	Update Issued (Latest Version)	Submitted to MoE	Submitted to ADB
<p>IEE Subproject of Coastal Road (CW01A) and Passenger Pier on Koh Tonsay Island in Kep Province (CW02A) – Based on Detailed Design of Road and Pier in Kep Province (https://www.adb.org/projects/documents/cam-49387-002-iee-6)</p>	August 2021	August 2021	August 2021
<p>IEE Subproject of Coastal Road (CW01a) and Passenger Pier on Koh Tonsay Island in Kep Province (CW02a) – Based on DED (https://www.adb.org/sites/default/files/project-documents/49387/49387-002-iee-en_9.pdf)</p>	January 2021	Dec 2020	25 Dec 2020
<p>IEE Subproject of Coastal Road (CW01A) and Passenger Pier on Koh Tonsay Island in Kep Province (CW02A) – Based on Basic Design of Coastal Road and Pier in Kep Subproject</p>	September 2020	September 2020	September 2020

Safeguards Documents	Update Issued (Latest Version)	Submitted to MoE	Submitted to ADB
https://www.adb.org/sites/default/files/project-documents/49387/49387-002-iee-en_5.pdf			
UXO clearance of CW 01a (Kep-Angkol Coastal Road Improvement)	13 February 2022	13 February 2022	16 February 2022
UXO clearance of CW 02a (Koh Tonsay Passenger Pier)	10 November 2021	13 November 2021	13 November 2021

2.4 National Approvals

12. The following table gives an update on the necessary national approvals required for the project to proceed.

Table 12. Status of National Approvals for Environmental Documents

Documents	Submitted to MoE	Approved By MoE:	Status – if not approved	Comment
CW03 IESIA (Initial Environmental and Social Impact) Report	10 January 2020	27 March 2020	Approved	<p>Environmental license for the Kep Landfill Subproject-CW03 issued by MOE on 10 April 2020.</p> <p>The improvement of the CLF design as indicated in the VO-03 has been communicated by MPWT-PMU with MOE officials³ in a face to face meeting December 2020 showing that such design changes will ensure the positive impacts on the environment and location of the new design system is within the project area described in the IESIA.</p> <p>It was assessed that the proposed project modifications do not affect the environment and that the approved IESIA, and the domestic environmental requirements of the Environmental Management and Monitoring Plan are still</p>

³ Face to face meeting by MPWT with MOE on 14 December 2020.

				valid, without need for further update through the MOE.
CW01a (Kep-Angkol Coastal Road Improvement) EMP	August 2020	05 Nov 2020	Approved	Environmental license for Kep-Angkol Coastal Road Improvement - CW 01 a issued on 05 Nov 2020
CW02a (Koh Tonsay Passenger Pier) IESIA	31 December 2020	17 May 2021	Approved	Environmental license for Koh Tonsay Passenger Pier - CW02a issued on 17 May 2021.

2.5 Construction Environmental Management Plan (CEMP) Approvals

13. The following table confirms the status of the Construction Environmental Management Plan (CEMP) for each CW package:

Table 13. Status of CEMP Approvals

Civil Works Package/ Subproject	CEMP Given to PMU	Approved By PMU:	Comment:
CW03 Kep landfill revised CEMP	01 April 2021	May 2020 April 2021 – updated CEMP	Document is updated and included COVID- 19 measures
CW01a (Kep-Angkol Coastal Road Improvement) CEMP	26 January 2022 (Revised draft submission)	27 January 2022	Transmitted to ADB 16 February 2022 with the UXO clearance
CW02a (Koh Tonsay Passenger Pier) CEMP	03 November 2021	04 November 2021	Submitted to ADB for NOL of civil works

3 EMP IMPLEMENTATION

3.1 Environmental Performance

14. The following tables give the environmental impact mitigation measures in the Borrower (Project) EMP and the corresponding CEMP and how the project is progressing with implementing the mitigation measures, for each subproject. The details of EMP/CEMP compliance assessment is presented in Annex 1. EMP Compliance Matrix - CW03 (Kep Landfill Improvements), Annex 3. EMP Compliance Matrix - CW01a (Kep-Angkol Coastal Road Improvement Project), and Annex 4. EMP Compliance CW02a (Koh Tonsay Passenger Pier).
15. The evidence for the compliance is through a combination of Site visits to observe site practices, document reviews and analyses of environmental monitoring data and lab results; consultation with affected people; and monthly environmental reporting from contractors and PMCES. There were no environmental compliance issues from previous report (2021 Jan-June SEMR) and that required actions to be compliant.

Table 14. Status of EMP Compliance CW03 (Kep Landfill Improvements)

EMP Requirement (Mitigation Measure) CONSTRUCTION PHASE	Compliance & Description (Yes, No, Partial)	Reasons for Not Full Compliance	Corrective Action	Timeline date for CAP
1. Air quality, noise and vibration sub plan	Yes			
2. Water quality management	Yes			
3. Erosion Control	Yes			
4. Vegetation removal and site restoration sub-plan	Yes	Site restoration activity is not yet due within the reporting period of this SEMR ⁴ .	The contractor is instructed to include restoration and rehabilitation activities done in the Monthly Environmental Monitoring Report.	July 2022
5. Spoil management and rehabilitation	Yes			
6. Solid and liquid waste management	Yes	Site restoration activity is not yet due (see numeral 4 above)	The contractor is instructed to include restoration and proper disposal of solid and liquid wastes, including hazardous wastes generated in the site during the construction. Activities to be described and reported in the Monthly Environmental	July 2022

⁴ The Contract CW03-Kep Landfil was extended up to 31 July 2022.

EMP Requirement (Mitigation Measure) CONSTRUCTION PHASE	Compliance & Description (Yes, No, Partial)	Reasons for Not Full Compliance	Corrective Action	Timeline date for CAP
			Monitoring Report of MTA.	

16. Most of the EMP subplans are assessed 'Compliant' as the measures are currently implemented. For item assessed as 'Partial', measures to be implemented by 2022 Q1-Q2.

Table 15. Status of EMP Compliance CW01a (Kep-Angkol Coastal Road Improvement)

EMP Requirement (Mitigation Measure)	Compliance & Description (Yes, No, Partial)	Reasons for Not Full Compliance	Corrective Action
PRE-CONSTRUCTION STAGE			
1. Detailed Design	yes		
2. Disclosure and re-engagement of community	Yes		
3. Government approvals including approved construction sites and place for disposal of wastes from construction	Yes		
4. Finalize EMP	Yes		
5. UXO survey/clearance	Yes		
6. Capacity development	Yes		
7. Recruitment of workers	Yes		
8. CEMP	Yes		

Table 16. Status of EMP Compliance CW02a (Koh Tonsay Passenger Pier)

EMP Requirement (Mitigation Measure)	Compliance & Description (Yes, No, Partial)	Reasons for Not Full Compliance	Corrective action
PRE-CONSTRUCTION STAGE			

EMP Requirement (Mitigation Measure)	Compliance & Description (Yes, No, Partial)	Reasons for Not Full Compliance	Corrective action
1. Disclosure and re-engagement of community	Yes		
2. Government approval	Yes		
3. Detailed design	Yes		
4. Finalize EMP	Yes		
5. Confirm Government of Province approved construction wastes disposal sites	Yes		
6. UXO Clearance	Yes		
7. Permits and licences	Yes		
8. Capacity development	Yes		
9. Recruitment of workers	Yes		
10. CEMP	Yes		

3.2 Health and Safety Performance

17. The following tables give the Health and Safety impact mitigation measures in the Borrower EMP and how the project is progressing with implementing the mitigation measures, for all subprojects.
18. COVID-19 mitigating measures were implemented by contractor of CW 03 (Kep Landfill Subproject) such as temperature taken any morning to all workers; information on precautions to be taken for reducing possible contamination on COVID-19 symptoms, disinfection of common places as mess, bathrooms among others.

Table 17. Status of Health and Safety Compliance – CW03 (Kep Landfill Improvement)

	Health and Safety Requirement	Compliance & Description (Yes, No, Partial)	Reasons for Not Full Compliance	Corrective Actions
1	Construction site sanitation. Workers Need to wear protective clothing	Yes	None	
2	First Aid kit needed on site	Yes	None	

3	Fire extinguishers needed on site	Yes	None	
4	COVID-19 measures	Yes	None	

Table 18. Status of Health and Safety Compliance – CW01a (Kep-Angkol Coastal Road Improvement)

	Health and Safety Requirement	Compliance & Description (Yes, No, Partial)	Reasons for Not Full Compliance	Corrective Actions
1	Construction site sanitation	Yes		
2	Occupational safety. Workers Need to wear protective clothing; fire extinguishers needed on site	Yes		
3	Food safety	Yes		
4	Disease prevention, health services. First Aid kit needed on site	Yes		
5	COVID-19 measures	Yes		

Table 19. Status of Health and Safety Compliance – CW02a (Koh Tonsay Passenger Pier)

	Health and Safety Requirement	Compliance & Description (Yes, No, Partial)	Reasons for Not Full Compliance	Corrective Actions
1	Construction site sanitation	Yes		
2	Occupational safety. Workers Need to wear protective clothing; fire extinguishers needed on site	Yes		
3	Food safety	Yes		
4	Disease prevention, health services. First Aid kit needed on site	Yes		
5	COVID-19 measures	Yes		

4 EMP MONITORING

4.1 Environmental Quality Monitoring

19. Environmental quality monitoring requirements are defined in the Monitoring Plan section of the EMP. The following table gives a summary of the environmental quality monitoring requirements for each subproject

4.1.1 CW 03 (Kep Landfill Improvement)

20. The following table gives information on the environmental quality monitoring which are currently implemented by MTA Construction Co., Ltd for the construction of Kep Landfill (CW03).

Table 20. EMP Environmental Quality Monitoring Requirements - Kep Landfill Improvement - CW03

Environmental Issue Monitored	Location	Parameters	Responsible Organisation	Frequency	Summary of Results
Qualitative Air, dust and noise levels.	Along access road and on CLF boundary and nearest residential receptors. All construction sites. And Entrance Road to the landfill	Air quality and noise Noise level Carbon monoxide Nitrogen Dioxide Sulfur Dioxide Total Suspended Particle (TSP) Ozone (O ₃)	Supervision: PMCES/PIU Implementation : Contractor - M.T.A Construction Co., Ltd	Quarterly during construction period. Continuously daily observations recorded in site diary.	Result shows that all parameters were within the air quality national standards.
Qualitative ground water; Qualitative turbidity levels	Along access road and on CLF boundary and nearest residential receptors. All construction sites. And Entrance Road to the landfill	Groundwater parameters pH Electrode Conductivity (EC) Total Dissolved Solids (TDS) Dissolved Oxygen (DO) Chemical Oxygen Demand(COD) Oil & Grease Ammonia (NH ₃) Ammonium(NH ₄) Detergents(MBAS) Nitrite(NO ₂) Nitrate (NO ₃) Phosphate(PO ₄) Total Nitrogen Total Phosphorus(TP) Arsenic(As) Cadmium (Cd) Copper (Cu) Iron (Fe, total) Lead (Pb) Zinc (Zn)	Supervision: PMCES/PIU Implementation : Contractor - M.T.A Construction Co., Ltd	Continuously daily qualitative observations recorded in site diary. Groundwater sampling and quality tests to be carried out quarterly	The parameters with noted exceedances include turbidity, aluminum and total iron; EC is below standard value; all other related parameters were reported within the applicable set standards.
Qualitative surface water;	Along access road and on CLF	Surface water parameters	Supervision: PMCES/PIU	Continuously daily observations	The parameters with noted

Environmental Issue Monitored	Location	Parameters	Responsible Organisation	Frequency	Summary of Results
Qualitative turbidity levels	boundary and nearest residential receptors. All construction sites and entrance road to the landfill	pH Temperature TDS DO TSS Chloride (Cl) Nitrate Phosphate Sulphate Ammonium BOD ₅ COD Total Nitrogen Total phosphorus Arsenic (As) Iron (Fe) Lead Mercury Total Coliform E-Coli Detergent Oil and Grease	Implementation : Contractor - M.T.A Construction Co., Ltd	recorded in site diary	exceedances in July 2021 sample collection include TSS, total nitrogen, phosphorous, COD and total coliform (46,000 MPN/100ml) were noted. The pH measure is slightly below acceptable value.
Operational health and Safety (OHS)	From all project-affected community areas, from hotline telephone number placed along access road and at gate to CLF.	Incidence of worker or public accident or injury	Supervision: PMCES/PIU Implementation : Contractor - M.T.A Construction Co., Ltd	Continuously daily observations recorded in site diary	No reported incident
Qualitative level of unmanaged and uncontained worker (domestic) and construction solid waste	At all construction areas	Public complaint, grievance case	Supervision: EA/PIU Implementation : PIU/ Contractor - M.T.A Construction Co., Ltd	Continuously daily observations recorded in site diary	No reported incident

Kep Landfill (CW03) Sampling location

21. Air quality sampling and water quality sampling activity for Kep Landfill (CW03) was conducted in 27 July 2021. The location of sampling points are shown in **Figure 13**. . The results are presented in **Table 21 - Table 25**.

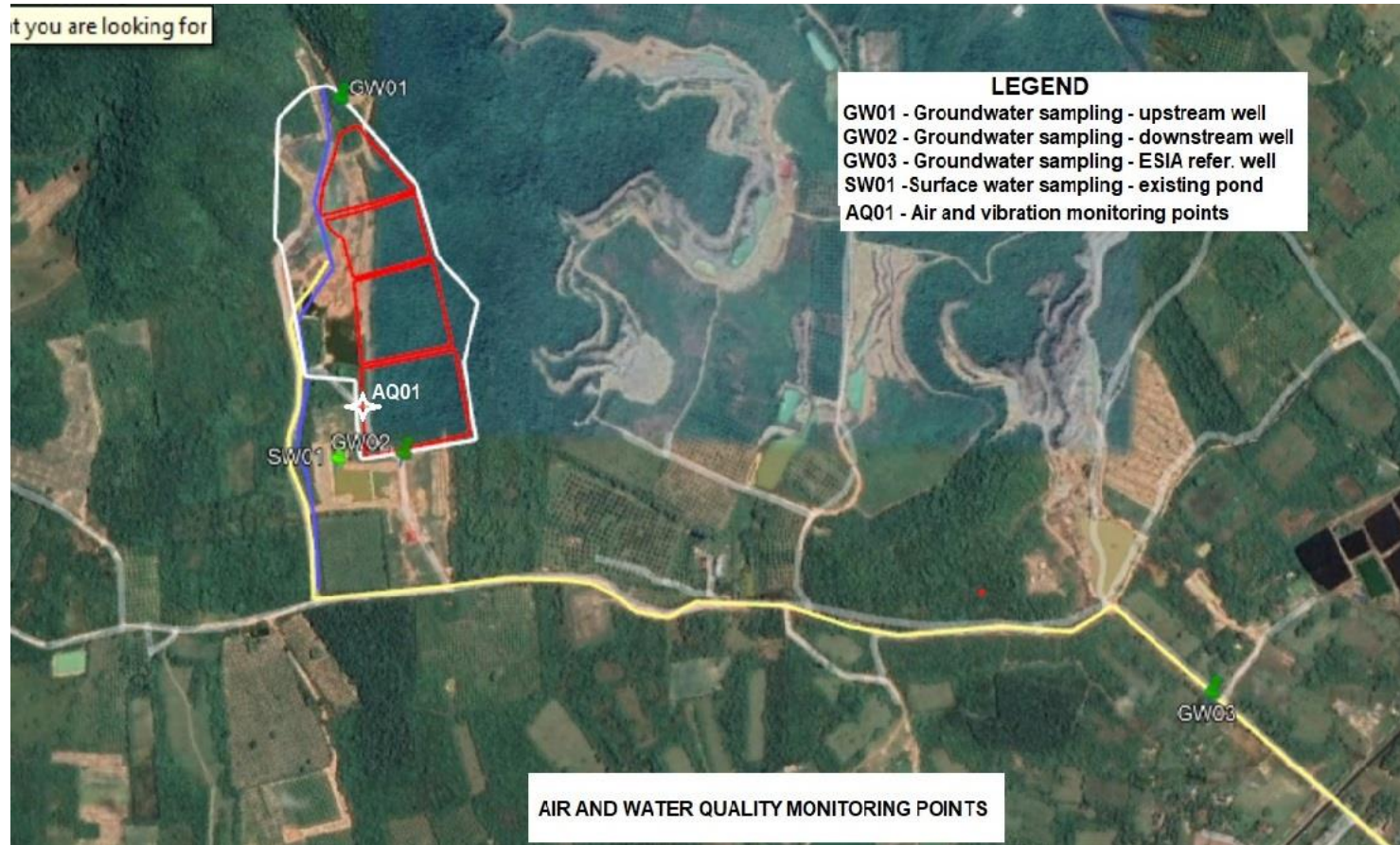


Figure 13. Sampling points for air, surface water and groundwater quality monitoring



Figure 14. Water quality, air quality and noise level sampling in Kep, July 2021

22. Summary of Results – Noise (Kep CLF). Noise level measurement was conducted on 27 July 2021 for 24 hours (Figure 14). Results show that the highest noise level was reported during daytime at 61.5 dB and the lowest is at 46.2 dB during night-time. The average noise level during night time from 11:00pm to 3:00 am is slightly above the acceptable limit. Vibration level during the sampling period showed acceptable values.

23. It should be noted that there is no residential area within the 2-km radius of the project site. No significant environmental impacts was caused by the noise due to the works. No grievance cases concerning noise quality impacts were reported during this period.

Table 21. Noise level monitoring results for Kep CLF Subproject, July 2021

Sampling Date	27-Jul-21					
Sampling Period	10:30 to 13:40 (next day)					
Survey Period		LAeq	Lmax	Lmin	Standard (Leq)	Remarks
Day	06:00-7:00	50.2	70.3	46.1	75	Passed
	7:00-8:00	46.6	72.3	46.9		Passed
	8:00-9:00	52.4	71.3	49.6		Passed
	09:00-10:00	55.2	71.8	54.6		Passed
	10:00-11:00	60.8	81.6	56.1		Passed
	11:00-12:00	60.2	82.7	53.8		Passed
	12:00-13:00	60.7	80.3	57.2		Passed
	13:00-14:00	60.8	82.8	54.8		Passed
	14:00-15:00	59.0	79.8	54.2		Passed
	15:00-16:00	61.5	85.2	53.8		Passed
	16:00-17:00	61.0	83.3	54.7		Passed
Evening	17:00-18:00	58.9	82.8	51.0	70	Passed
	18:00-19:00	53.0	75.9	46.2		Passed
	19:00-20:00	52.2	73.2	47.3		Passed
	20:00-21:00	49.4	67.3	47.5		Passed
Night	21:00-22:00	51.3	72.6	46.1	50	Passed
	22:00-23:00	49.4	66.8	46.0		Passed
	23:00-00:00	53.6	67.7	51.5		Above acceptable limit
	00:00-1:00	51.1	70.7	45.6		Above acceptable limit
	1:00-2:00	56.5	71.0	45.1		Above acceptable limit
	2:00-3:00	53.9	68.7	45.2		Above acceptable limit
	3:00-4:00	46.2	67.3	44.1		Passed
	4:00-5:00	45.7	63.7	43.8		Passed
5:00-6:00	47.6	70.0	41.2	Passed		
24 Hours Average		54.1	74.1	49.3		

Table 22. Vibration level monitoring results for Kep CLF Subproject, February 2021

UTM 48 P 0426544/1167641						
Sampling Date	27-Jul-21					
Sampling Period	10:30 to 13:40 (next day)					
Survey Period		LAeq	Standard (Leq)	Lmax	Lmin	Remarks
Day	06:00-7:00	37.2	65	41.5	13.1	Passed
	7:00-8:00	36.0		39.0	13.3	Passed
	8:00-9:00	35.0		36.0	14.3	Passed
	09:00-10:00	34.4		36.6	12.4	Passed
	10:00-11:00	37.1		41.3	13.1	Passed
	11:00-12:00	36.6		41.9	11.6	Passed
	12:00-13:00	40.1		47.0	13.5	Passed
	13:00-14:00	37.6		44.2	11.3	Passed
	14:00-15:00	42.5		43.2	12.1	Passed
	15:00-16:00	39.3		46.3	12.5	Passed
	16:00-17:00	36.5		41.7	11.5	Passed
	17:00-18:00	36.4		41.5	11.6	Passed
Night	18:00-19:00	36.5	60	41.7	11.6	Passed
	19:00-20:00	34.6		39.9	11.6	Passed
	20:00-21:00	34.7		38.0	11.5	Passed
	21:00-22:00	34.7		38.1	11.6	Passed
	22:00-23:00	34.9		38.3	11.6	Passed
	23:00-00:00	34.1		37.6	10.8	Passed
	00:00-1:00	34.0		37.3	11.0	Passed
	1:00-2:00	33.0		35.3	11.0	Passed
	2:00-3:00	33.6		36.3	11.1	Passed
	3:00-4:00	34.0		37.2	11.0	Passed
	4:00-5:00	33.4		36.2	10.9	Passed
5:00-6:00	34.1	37.3	11.1	Passed		
24 Hours Average		35.8		39.6	11.9	

Kep Landfill (CW03) Surface Water Quality

24. Summary of Results – Surface Water quality (Kep CLF). Surface water samples from the sampling point at the project site were collected in 1 March 2021 (**Figure 12**)**Error! Reference source not found..** At the minimum, the freshwater samples were being tested and analysed for parameters such physical (pH, Total Dissolved Solids (TDS), Total Suspended Solids (TSS)); inorganic and non-metallic (total nitrogen, total phosphorus); organic and biological constituents (dissolved oxygen (DO), Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), oil and grease and total coliform); and heavy metals (detergent, sulphate, arsenic (As), cadmium (Cd), iron (Fe), Lead (Pb), total mercury). The surface water laboratory test result is presented in **Error! Reference source not found..** The surface water quality results were compared to the water quality standard for lake and reservoir set by MOE, Government of Cambodia.

Table 23. Surface water quality monitoring results for Kep CLF Subproject, July 2021

Parameter	Results	Adopted Standard	Unit	Reference	Remarks
Year/ quarter	29 July 2021				
Physical Characteristics					
TSS	59.00	1-15	mg/L	Standard for lake and reservoir, MOE	Above acceptable limit
TDS (Total)	138.00	<1000	mg/L	Standard for lake and reservoir, MOE	Passed
pH	6.22	6.5-8.5		Standard for lake and reservoir, MOE	Slightly below acceptable limit
Inorganic and nonmetallic constituents					
Total Nitrogen	0.78	0.1-0.6	mg/L	Standard for lake and reservoir, MOE	Above acceptable limit
Phosphorus (as PO ₄ ³⁻)	0.39	0.005-0.05	mg/L	Standard for lake and reservoir, MOE	Above acceptable limit
organic and biological constituents					
Dissolved Oxygen (Total)	2.40	7.5-2.0	mg/L	Standard for lake and reservoir, MOE	Passed
BOD ₅	2.79	<30	mg/L	Standard for lake and reservoir, MOE	Passed
COD ^b	8.64	1-8	mg/L	Standard for lake and reservoir, MOE	Above acceptable limit
Total Coliform	4.6X10 ⁴	<1000	MPN/ 100ml	Standard for lake and reservoir, MOE	Above acceptable limit
Oil and Grease	4.69	<5.0	mg/L	Standard for lake and reservoir, MOE	Passed
Elements					
Arsenic (As)	0.005	<0.01	mg/L	Standard for lake and reservoir, MOE	Passed
Aluminum	0.0002	<0.001	mg/L	Standard for lake and reservoir, MOE	Passed
Iron (Fe-Total)	4.17	<1	mg/L	Standard for lake and reservoir, MOE	Above acceptable limit
Lead (Pb)	0.01	<0.01	mg/L	Standard for lake and reservoir, MOE	Passed
Mercury (Hg-Total)	0.0003	<0.0005	mg/L	Standard for lake and reservoir, MOE	Passed
Detergent (MBAS)	0.04	<5.0	mg/L	Standard for lake and reservoir, MOE	Passed
Sulfate (SO ₄)	5.00	<300	mg/L	Standard for lake and reservoir, MOE	Passed

Note: These parameters are MoE-approved on IESIA for some pond nearby the project. Standard values are based on Prakas 120 (Launching the Model guideline of term of reference (ToR) for development project of Infrastructures and Tourism sector) dated 11 April 2018.

25. The measures highlighted in red are parameters with exceedances according to the MOE standard for lake and reservoir. The parameters with noted exceedances in July 2021 sample collection include TSS, total nitrogen, phosphorous, COD, Iron and total coliform (46,000 MPN/100ml). The pH measure is slightly below acceptable value. All other related parameters were reported within the applicable set standards. The sampling site is a pond created in an abandoned borrow pit located downstream of the existing open waste dumping site operated for years prior to the start of construction. The deep borrow pit intersects the shallow groundwater which explains the high Iron concentration in the pond, as already observed in the well test results. It should be noted that MTA Construction Co. Ltd provided sanitation facilities for their workers and staff in the worker camp located near the mentioned pond. No grievance cases concerning surface water quality impacts were reported during this period. Contractor is required to conduct further surface water sampling and tests to verify if recent works have affected the water quality

Kep Landfill (CW03) Groundwater Quality

26. Summary of Results – Groundwater quality (Kep CLF). Groundwater samples from the sampling site at the project site were collected in 29 July 2021 (**Figure 13**). The monitoring wells from which the samples were collected are shallow wells with static water table depth at about 1 – 3.3 mbgs. The groundwater samples were tested and analysed for parameters such as physical (TSS, TDS, pH, electric conductivity (EC), turbidity, total hardness); inorganic and non-metallic (total nitrogen, phosphorus, chloride, nitrate, sulphate); organic and biological constituents (DO, BOD, COD, total coliform, oil and grease); and heavy metals (arsenic (As), cadmium (Cd), iron (Fe), Lead (Pb), total mercury, detergent and sulphate). The groundwater quality results were compared to the ground water standards indicated in Prakas No. 120 dated 11 April 2018.

Table 24. Groundwater quality monitoring results for Kep CLF Subproject, July 2021

Parameter	WS-01	WS-03	Adopted Standard	Unit	Reference	Remarks
	Upstream of CLF, Near intake weir. 10.564545° 104.335295°	Downstream of CLF, near the campsite. 10.585284° 104.314939°				
Physical Characteristics						
TDS	129.00	200.00	800.00	mg/L	Prakas 120 dated 11 April 2018 MOE	Passed
pH	6.65	6.57	6.5-8.5		Prakas 120 dated 11 April 2018 MOE	Passed
Electric Conductivity (EC)	294.00	454.00	500-1500	µS/cm	Prakas 120 dated 11 April 2018 MOE	Below standard value (see footnote at page 37)
Turbidity	18.00	8.00	5	NTU	Prakas 120 dated 11 April 2018 MOE	Above acceptable limit
Total Hardness (as CaCO ₃)	250.00	200.00	300	mg/L	Prakas 120 dated 11 April 2018 MOE	Passed
Inorganic and nonmetallic constituents						
Total Nitrogen	Not measured	Not measured	-	mg/L		
Phosphorus (as PO ₄ ³⁻)	Not measured	Not measured	-	mg/L		
Chloride (Cl)	25.00	70.00	250	mg/L	Prakas 120 dated 11 April 2018 MOE	Passed
Fluoride (F ⁻)	0.27	0.18	1.5	mg/L	Prakas 120 dated 11 April 2018 MOE	Passed
Nitrate (NO ₃)	1.20	2.00	50	mg/L	Prakas 120 dated 11 April 2018 MOE	Passed
Sulphate (SO ₄)	6.00	7.00	-	mg/L		
organic and biological constituents						
Dissolved Oxygen	Not measured		800	mg/L	Prakas 120 dated 11 April 2018 MOE	Passed
COD ^b	Not measured		-	mg/L		Passed
Total Coliform	0	0	-	MPN/100ml	Prakas 120 dated 11 April 2018 MOE	Passed

Parameter	WS-01	WS-03	Adopted Standard	Unit	Reference	Remarks
	Upstream of CLF, Near intake weir. 10.564545° 104.335295°	Downstream of CLF, near the campsite. 10.585284° 104.314939°				
Thermo tolerant Coli form (E-Coli)	0	0	0	MPN/100ml	Prakas 120 dated 11 April 2018 MOE	Passed
Oil and Grease	Not measured		-	mg/L		
Elements						
Aluminum (Al)	0.74	ND	0.2	mg/L	Prakas 120 dated 11 April 2018 MOE	Above acceptable limit – WS01
Arsenic (As)	0.006	0.002	0.05	mg/L	Prakas 120 dated 11 April 2018 MOE	Passed
Cadmium (Cd)	ND	ND	0.003	mg/L	Prakas 120 dated 11 April 2018 MOE	Passed
Chromium (Cr-total)	0.01	0.02	0.05		Prakas 120 dated 11 April 2018 MOE	Passed
Iron (Fe-Total)	6.07	1.42	0.3	mg/L	Prakas 120 dated 11 April 2018 MOE	Above acceptable limit
Lead (Pb)	Not measured	Not measured	1.5	mg/L	Prakas 120 dated 11 April 2018 MOE	
Manganese	0.08	0.18	0.1	mg/L	Prakas 120 dated 11 April 2018 MOE	Passed
Mercury (Hg-Total)	ND	ND	0.001	mg/L	Prakas 120 dated 11 April 2018 MOE	
Detergent (MBAS)	Not measured	Not measured	-	mg/L	-	

27. The measures highlighted in red shows parameters exceeding acceptable limits according to Prakas 120 of 11 April 2018 - Parameters and standards for groundwater quality (Launching the Model guideline of term of reference for development project of Infrastructures and Tourism sector). The parameters with noted exceedances include turbidity, aluminum and total Iron; EC is below standard value⁵; all other related parameters were reported within the applicable set standards. In effect, higher parameters, well above the standards, were measured in the well SW01, which is located upstream of the Landfill site, where the upstream basin is a natural forest devoid of any settlement or any human pollution source. As reported in the IEE (May 2020), the general soil type of the project site is characterized as clayey fine to course gravel interlayered with weather metamorphic rock, which may produce turbid water at shallow depth. Iron and aluminum concentration exceeding standard values may be attributed to natural factors such as the mineral composition of underlying geology.
28. Elevated concentration of iron was already reported during baseline data collection in IESIA, 2020 and IEE, 2020 May. Therefore, high iron level is clearly due to the regional geologic substratum and not an indicator of contamination due to previous waste dumping or to the ongoing construction activity. It should be also noted that the groundwater is not used for drinking in the vicinity of the project area. No grievance cases concerning groundwater quality impacts were reported during this period. However, Contractor is required to conduct further groundwater sampling and tests to verify if recent works have affected the groundwater quality.

⁵ The conductivity value EC is related to the amount of total dissolved salts (dissolved ions) in water. Low values of EC and TDS below 500 µS/cm simply indicate low ions concentration, and, therefore, low level of potential pollutants in the groundwater.

Kep Landfill (CW03) Air quality

29. Summary of Results – Air quality (ambient air) (Kep CLF). Air quality monitoring was conducted on 27 July 2021 (Annex 2. Laboratory Result of surface water, groundwater, air quality and noise). Parameters tested were carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), methane (CH₄), PM₁₀, PM_{2.5}, and lead (Pb). Result shows that all parameters were within the air quality national standards (Table 25). No significant environmental impacts attributed to the works were noted during the sampling. No grievance cases concerning air quality impacts were reported during this period.

Table 25. Ambient Air monitoring results for Kep CLF subproject, July 2021

Parameter	Reference Method	UTM 48 (Results)	National standards, MOE (24-hr average)	No. of sampling hours	Units	Remarks
Carbon Monoxide (CO)	Method Carbon Monoxide Passive Dosimeter	0.294	20 (8-hr average)	8	mg/m ³	Passed
Nitrogen Dioxide (NO ₂)	Method Saltzman [ISO 6768:1998 (E)]	0.014	0.1	24	mg/m ³	Passed
Sulfur Dioxide (SO ₂)	Method Pararosaniline [ISO 6767:1990 (E)]	0.029	0.3	24	mg/m ³	Passed
Methane (CH ₄)	Method Portable CH ₄ Gas Detector	ND	-	-	mg/m ³	
PM ₁₀	Method Weight Concentration Measuring	0.040	0.120	24	mg/m ³	Passed
PM 2.5	Method Weight Concentration Measuring	0.021	0.050	24	mg/m ³	Passed
Lead (Pb)	Method 3500-Pb C (HNO ₃ , HCl Digestion)	ND	0.005	24	mg/m ³	Passed

4.1.2 CW 01a (Kep-Angkol Coastal Road Improvement)

Table 26. EMP Environmental Quality Monitoring Requirements – CW01a (Kep-Angkol Coastal Road Improvement)

Environmental Issue Monitored	Location	Parameters	Responsible Organisation	Frequency	Summary of Results
Qualitative Air, dust and noise levels.	All construction sites	Air and noise level Carbon monoxide Nitrogen Dioxide Sulfur Dioxide CH ₄ Total Suspended Particle (TSP) Ozone (O ₃)	Supervision: PMCES/PIU Implementation: Contractor - Kiri Dangrek Construction Co., Ltd and M.T.A	Every 6 mos	None No sampling activity was carried out in the reporting period (the project started in January 2022)

Environmental Issue Monitored	Location	Parameters	Responsible Organisation	Frequency	Summary of Results
		PM10 PM2.5 Pb	Construction Co., Ltd		
Noise	Nearest residential receptor (two residential receptors)	Noise level	Supervision: PMCES/PIU Implementation: Contractor - Kiri Dangrek Construction Co., Ltd and M.T.A Construction Co., Ltd	quarterly	None Same as above
Surface water quality, testing in the following location within project site:	Location #1 (X:428097 ; Y: 1160159) Location# 2 (X:431974 ; Y: 1156555)	pH, TDS, TSS, DO, BOD5, COD, oil & grease, Detergent, SO4, TN, TP, Pb, As, Cd, Fe, Hg, and Total Coliform.	Supervision: PMCES/PIU Implementation: Contractor - Kiri Dangrek Construction Co., Ltd and M.T.A Construction Co., Ltd	Every 6 mos	None Same as above
Operational health and Safety (OHS) Public health and safety including traffic and other project related impacts Waste management	From all project-affected community areas, from hotline telephone number placed along	Incidence of worker or public accident or injury	Supervision: PMCES/PIU Implementation: Contractor - Kiri Dangrek Construction Co., Ltd and M.T.A Construction Co., Ltd	Continuously daily observations recorded in site report	None Same as above

4.1.3 CW 02a (Koh Tonsay Passenger Pier)

Table 27. EMP Environmental Quality Monitoring Requirements - Koh Tonsay Passenger Pier - CW02A

Environmental Issue Monitored	Location	Parameters	Responsible Organisation	Frequency	Summary of Results
Air quality	Nearest residential receptors (Construction sites and nearest residential area)	TSP, PM10, CO, NO2, SOx	Supervision: PMCES/PIU Implementation: Contractor - Vimeanchey Group Co., Ltd.	Per quarter per location	None. No sampling was carried out in the reporting period (the project was still in pre-construction stage)

Environmental Issue Monitored	Location	Parameters	Responsible Organisation	Frequency	Summary of Results
Noise level	Nearest residential receptors (six tourist resorts)	Noise level	Supervision: PMCES/PIU Implementation: Contractor - Vimeanchey Group Co., Ltd.	quarterly	None Same as above
Groundwater quality	At monitoring wells	during construction phase – full range of parameters as per Cambodia standards	Supervision: PMCES/PIU Implementation: Contractor - Vimeanchey Group Co., Ltd.	Every 6 months (1 sampling in dry season and 1 sampling in wet season)	None Same as above
Marine water quality	3 sampling locations as per IEE, Aug 2021	17 parameters as IEE, Aug 2021	Supervision: PMCES/PIU Implementation: Contractor - Vimeanchey Group Co., Ltd.	Conduct monitoring every 6 months (dry season and rainy season) during construction phase – full range of parameters as per Cambodia standards	None Same as above
Operational health and Safety (OHS) Public health and safety including sea traffic, leaks and spills and other project related impacts Waste management	From all project-affected community areas, from hotline telephone number placed along	Incidence of worker or public accident or injury	Supervision: PMCES/PIU Implementation: Contractor - Vimeanchey Group Co., Ltd.	Continuously daily observations recorded in site report	None Same as above

30. The contractors Kiri Dangrek Construction Co., Ltd and M.T.A Construction Co., Ltd for the construction of Kep-Angkol Coastal Road Improvement – (CW01A); and Vimeanchey Group Co. Ltd. for the construction of Koh Tonsay Passenger Pier (CW02A) have not yet carried out any environmental quality monitoring during the SEMR reporting period.
31. The construction activities for the Kep-Angkol Coastal Road Improvement - CW01A will officially start on 24 January 2022.
32. The geotechnical studies and UXO clearance were undertaken since December 2021 in preparation for the actual construction of infrastructure of Koh Tonsay Passenger Pier (CW02A). Vimeanchey Group Co., Ltd, the contractor for CW02A) has recently submitted Environmental Monitoring Report to PMU/PMCES covering the period Dec 2021 – April 2022. The delay of the EMR submission was due to the delayed appointment of Environment Specialist, which was only solved at the end of March 2022 with the hiring of Mr. Song Kimchhuom.

4.2 Construction Phase Affected People Consultation

33. The improvement of the CLF design as indicated in the VO-03 has been communicated by MPWT-PMU to MOE in a face to face meeting December 2020 showing that such design changes will ensure the positive impacts on the environment and location of the new design system is within the project area described in the IESIA. It was assessed by MOE that the proposed project modifications did not affect the environment and that the approved IESIA, and the domestic environmental requirements of the Environmental Management and Monitoring Plan and issued construction license are still valid, without need for further update.
34. Consultations regarding Kep Landfill Subproject with local people were not conducted during the SEMR reporting period and deemed not necessary as the landfill works are within the project site of the Kep Landfill Subproject as it was described in previous consultation meetings carried out prior to the start of the construction activities. The PIU is constantly in contact with local district governors and people representatives. No grievances were reported either verbally or recorded in the GRM records during this SEMR reporting period.
35. There have not been any consultations on environmental issues with affected people for Kep-Angkol Coastal Road Improvement (CW01A); and Koh Tonsay Passenger Pier (CW02A) during this reporting period since the project construction contract was signed only on 27 December 2021.

Table 28. Construction Phase Consultations with Affected People

Subproject	Consultation date	Person Consulted	Outcome/ issues	Corrective Action needed	Action Implemented by (person/date)
Kep Landfill Improvement (CW03)	-				
Kep-Angkol Coastal Road Improvement (CW01A)	-				
Koh Tonsay Passenger Pier (CW02A)	29 December 2021	No. 6 persons representative of community	Requested of extension of pier for increased mooring capacity	Pier design modification	PMCES in consultation with Contractor

5 COMPLAINTS, ISSUES, CORRECTIVE ACTION

5.1 Information Disclosure

36. The subproject components were introduced to the public and key stakeholders during initial consultation meetings for the FS designs of all three subprojects. As discussed in Section 2.3 of this report, ADB has disclosed the cleared DED stage updated IEEs and EMPs in ADB website. No other information disclosure activities have been carried out during the reporting period.
37. There are no complaints received from the local community. Sign boards regarding GRM are installed Infront of the campsite (see **Figure 15** and **Figure 16**).



Figure 15. GRM Signage in Kep Landfill CW03



Figure 16. The walkway land clearing and excavation works at PK 0+590 and Project Sign Board

5.2 Grievance Redress Mechanism

38. No outstanding grievance case or pending issues or complaints reported in previous reporting period Jan-June 2021 and in the current reporting period of July-December 2021.

5.3 Corrective Actions

39. The following table gives information on any formal corrective action issued to the contractor of CW03 in order to improve environmental performance:

Table 29. Corrective Action Issued for CW03


Reason for Corrective Action	Date Issued	Outcome	Comment / Follow Up
Exceedances observed in some parameters of groundwater quality in Kep CLF	Mar 2022	Contractor was instructed to conduct further investigation to the groundwater quality of wells in the project area. This it to be undertaken in 1 st Semester 2022.	PMCES and PMU will follow-up on the water quality results investigation and instruction on required mitigation (if any) to be carried out by MTA
Vegetation removal and site restoration sub-plan	June 2022	Site restoration activity is scheduled to start in July 2022. The contractor is instructed to include restoration and rehabilitation activities in the July Monthly Environmental Monitoring Report.	PMCES and PMU will conduct site monitoring and inspection to confirm compliance
Solid and liquid waste management	June 2022	Site restoration activity is scheduled to start in July 2022, The contractor is instructed to include restoration activities, including disposal of solid and liquid wastes including hazardous wastes generated during the construction in the July Monthly Environmental Monitoring Report.	PMCES and PMU will conduct site monitoring and inspection to confirm compliance


No CAP issued for the CW01A and CW02A Subprojects.



6 CONCLUSION & RECOMMENDATION










40. The construction works of the Kep-Angkol Coastal Road Improvement - CW01a and Koh Tonsay Passenger Pier - CW02a have been awarded to construction contractors - Kiri Dangrek Construction Co., Ltd and M.T.A Construction Co., Ltd (JV) in September 2021 and Vimeanchey Group Co., Ltd in December 2021, respectively. Only preparatory construction activities were carried out during the reporting period which includes UXO clearance, topographical surveys and initial clearing. Generally, the contraction works in all 3 subprojects are progressing as planned.
41. In general, the implementation of environmental management measures during pre-construction (for CW01a and CW02a) and construction phases (CW03) of the three (3) subprojects as implicated in the IEE and EMPs, is currently taken into account and assessed to be compliant. Some items assessed as partial compliance as action/ activities are in progress.
42. There were no complaints raised by project affected persons during this reporting period. To mention only the request made by Community Representatives in Koh Tonsay regarding extension of pier for increased mooring capacity. PMCES studied in consultation with the contractor the required pier design modification to be considered in the VO-01.
43. All Environmental Safeguard documents, UXO clearances and other related clearances are in place and update accordingly. The IEE of CW03 is updated in July 2021 and was based upon the Revised Leachate Treatment Plant Design of Kep Solid Waste Improvement Subproject. There is no need to update the IESIA of Kep CLF as confirmed by MOE during face-to-face meeting in Dec 2020.
44. The HSE Officer of MTA Construction Co. Ltd, the Contractor of Kep Landfill has been mobilized in February 2021 and HSE Officer for the Kep-Angkol Coastal Road Improvement - CW01a (Kiri Dangrek Construction Co., Ltd and M.T.A Construction Co., Ltd (JV) was mobilized in Jan 2022. The HSE for Koh Tonsay Passenger Pier - CW02a (Vimeanchey Group Co., Ltd) was able to mobilize HSE Officer only in late March 2022. The contractor for CW02A submitted to PMU/PMCES only in May 2022 the Environmental Monitoring Report for the reporting period December 2021 to April 2022.
45. COVID-19 measures were continuously implemented in the project site of Kep Landfill subproject. COVID-19 measures are being considered in the CEMPs of Kep-Angkol Coastal Road Improvement - CW01a and Koh Tonsay Passenger Pier - CW02a.
46. No CAPs were issued for CW01a and CW02a. CAPs for CW03 include exceedances observed in some parameters of surface and groundwater quality in Kep CLF where further monitoring should be carried out in First Semester 2022. Measures for site restoration activities of CW03 are required to start prior to project completion expected on 30 July 2022. .
47. Site monitoring and inspection will be conducted by PMCES/PMU to confirm compliance with ADB's Safeguard requirements. Continuous monitoring to various environmental parameters to be reported in detail in the next reporting period of SEMR (January-June 2022) for the three subprojects: CW03 Kep landfill, CW01a Kep-Angkol Coastal Road Improvement, and CW02a Koh Tonsay Passenger Pier. The Environmental monitoring reports will include laboratory results of the measured environmental parameters, to be compared to national standards and any available baseline information.




Annex 1. EMP Compliance Matrix - CW03 (Kep Landfill Improvements)

EMP Requirement (Mitigation Measure)	Compliance & Description (Yes, No, Partial)	Comment or Further Explanation if Needed	Reasons for Not Full Compliance	Corrective Actions
1. Air, dust, noise and vibration sub-plan	Yes	<p>Implemented when necessary. It is generally considered wet season during this reporting period (2021 July-Dec) Noise level, vibration and air quality measurement done in July 2021.</p> <p><i>Dust control by watering</i> implemented when necessary. Cells were already installed with geotextile, concrete slab, HDPE. Generation of dust due to exposed soil area is negligible.</p>		
2. Water quality control	Yes	Mitigating measures implemented. Surface water and groundwater quality monitoring implemented. Some noted exceedances in groundwater samples collected in July 2021 (Ref: Environmental Monitoring Report by MTA, July 2021)		Further investigation to be carried out by the contractor (MTA)
3. Erosion control sub-plan	Yes	<p>Most of the slopes were already cut and left exposed before the landfill area was handed over to MTA.</p> <div style="text-align: center;">  </div> <p>DRONE PHOTO TAKEN IN JUNE 2020- Only few days after the handover of the SLF area to MTA</p>		

EMP Requirement (Mitigation Measure)	Compliance & Description (Yes, No, Partial)	Comment or Further Explanation if Needed	Reasons for Not Full Compliance	Corrective Actions
		<p>There are about 90% of the excavated slope are of rocky nature, with little or no erosion risk. Mitigation of erosion risk is the creation of upstream berm with runoff interception channels excavated to convey runoff away from the slope cut.</p> <div style="text-align: center;">  </div> <p><i>Earthworks at the slope of landfill site and installation of HDPE in cells</i></p>		



EMP Requirement (Mitigation Measure)	Compliance & Description (Yes, No, Partial)	Comment or Further Explanation if Needed	Reasons for Not Full Compliance	Corrective Actions
		 <p><i>Concreting of cell slope of dump sites</i></p>  <p><i>The face of the slope at the landfill site is a natural stone. Drainage system constructed.</i></p>		
4. Tree and vegetation removal, and site restoration sub-plan	Yes	Considered in the CEMP. Implementation of such mitigation measure by MTA to be reported during any vegetation clearing activity at the construction site. No tree cut during this reporting period.		
5. Work camps	Yes	Camp is established.		



EMP Requirement (Mitigation Measure)	Compliance & Description (Yes, No, Partial)	Comment or Further Explanation if Needed	Reasons for Not Full Compliance	Corrective Actions						
		<div> </div> <p>MTA Construction Co., Ltd mobilized in 4 June 2020 commencing with installation of work camp with the associated facilities:</p> <table border="1"> <tr> <td> <p>Water tank for domestic and drinking water</p> </td> <td>  </td> </tr> <tr> <td> <ul style="list-style-type: none"> • Separate water closet (toilet) with septic for male and female workers • Wash/ bathing area </td> <td>  </td> </tr> <tr> <td> <ul style="list-style-type: none"> • Trash bins, fire extinguishers provided • Scrap metals are collected and sold to recycling facility </td> <td>  </td> </tr> </table>	<p>Water tank for domestic and drinking water</p>		<ul style="list-style-type: none"> • Separate water closet (toilet) with septic for male and female workers • Wash/ bathing area 		<ul style="list-style-type: none"> • Trash bins, fire extinguishers provided • Scrap metals are collected and sold to recycling facility 			
<p>Water tank for domestic and drinking water</p>										
<ul style="list-style-type: none"> • Separate water closet (toilet) with septic for male and female workers • Wash/ bathing area 										
<ul style="list-style-type: none"> • Trash bins, fire extinguishers provided • Scrap metals are collected and sold to recycling facility 										



EMP Requirement (Mitigation Measure)	Compliance & Description (Yes, No, Partial)	Comment or Further Explanation if Needed		Reasons for Not Full Compliance	Corrective Actions
					
		<ul style="list-style-type: none"> • H&S signages installed 			
		<ul style="list-style-type: none"> • First aid kit 			


EMP Requirement (Mitigation Measure)	Compliance & Description (Yes, No, Partial)	Comment or Further Explanation if Needed	Reasons for Not Full Compliance	Corrective Actions
		<ul style="list-style-type: none"> Provision of drinking water for workers and staff at the project site. Minor action from MTA: water containers should not be stored in direct sunlight and must be elevated from the floor by i.e. putting on a wooden pallet. 		
6. Training and capacity building	Yes			
7. Construction materials acquisition, transport and storage subplan	Yes	<p>Fuel tank area constructed. H&S and safety warning signs were installed in the fuel tank area. Provincial Fire Department contact number is made available to workers in case of fire.</p> <p>Improvement at the Fuel tank area included installation of the fire extinguisher above floor. Further actions to include provision of oil drip pans; installation of oil traps or collectors such as rock filed bags, block and gravel on drainage outfalls.</p>		
8. Excavated spoil management subplan	Yes	<p>The excavated spoil is also used as backfill material in other parts of the project site. The excavated soil during the excavation work for the HDPE installation was used as backfill material at the excavation site (MTA Environment Monitoring Report, July 2021). Excess topsoil at the construction sites was temporarily stockpiled in a labelled area for post-construction rehabilitation/ restoration works of sites.</p>		





EMP Requirement (Mitigation Measure)	Compliance & Description (Yes, No, Partial)	Comment or Further Explanation if Needed	Reasons for Not Full Compliance	Corrective Actions
		 <p><i>Soil excavation and backfill activity at Cell 1</i></p> <p><i>All excavation works in the Treatment, Wetland and Hazardous areas are within the project area and are according to dimensions as directed and inspected by PMCES.</i></p>  <p><i>Excavation footing work, footing of storage building and landfill cells</i></p>		
9. Solid and liquid construction waste sub-plan	Partial	Toilet with standard septic tank of adequate design and size installed at the work camps. Waste bins for solid wastes are provided in the construction area. Scrap metals, plastic, paper and tin cans are sold to waste buyers		The contractor was instructed to included restoration and rehabilitation activities including disposal of solid and liquid wastes including hazardous wastes generated during

EMP Requirement (Mitigation Measure)	Compliance & Description (Yes, No, Partial)	Comment or Further Explanation if Needed	Reasons for Not Full Compliance	Corrective Actions
		 <p><i>Segregation of waste at the construction site</i></p>  <p><i>Used oil/ grease applied to paint concrete board/ form for precast reinforced concrete slabs</i></p> <p>Site restoration is ongoing</p>		the construction in the Monthly Environmental Monitoring Report.
10. Implement utility and power disruption sub-plan	Yes	Considered in the CEMP. Implementation of such mitigation measure by MTA to be reported when such measures are necessary. There is no foreseen utility and power disruption which may be caused by the project construction activities of CW03 Kep Landfill Improvement Subproject.		
11. Implement worker and public safety sub-plan	Yes	H&S signages, workers' PPE and uniforms, trash bins provided.		

EMP Requirement (Mitigation Measure)	Compliance & Description (Yes, No, Partial)	Comment or Further Explanation if Needed	Reasons for Not Full Compliance	Corrective Actions
		 <p><i>Provision of workers' PPE and uniforms</i></p>  <p><i>Various signages at the construction site</i></p> <p>Provision of first aid kits for workers and staff at the project site installed at the start of construction activities and replenished with supplies until this reporting period.</p>		

EMP Requirement (Mitigation Measure)	Compliance & Description (Yes, No, Partial)	Comment or Further Explanation if Needed	Reasons for Not Full Compliance	Corrective Actions
		 <p>COVID-information, masks, temperature monitoring given currently to all workers. COVID-19 vaccination for workers started in July 2021 and is reported to be carried out until December 2021. The COVID-19 vaccination will be done to target all workers to be vaccinated. COVID-19 rapid test kits are also available at the project site.</p> <p>Training on HIV and COVID-19 prevention was carried out on 01-Feb.2021 at the site.</p> <p>Training on PPE and Environment, health and safety concerns were carried out by MTA (Mr. Tith Tykea) to all workers and repeated once or twice every month.</p> <p>All laborers/ workers who have reported at the construction site were issued PPEs, face masks, alcohol and have temperature checked.</p> <p>To date, there is no recorded accident or incident at the construction of CW03 Kep Landfill Subproject.</p>		
12. Civil works	Yes	July-December is generally characterized as wet season. Mitigation measures on earth works and excavation activities done in this period are implemented as necessary.		
13. Cultural chance finds sub-plan	Yes	No artifacts were found during the excavation works in <i>Treatment, Wetland and Hazardous areas.</i>		

EMP Requirement (Mitigation Measure)	Compliance & Description (Yes, No, Partial)	Comment or Further Explanation if Needed	Reasons for Not Full Compliance	Corrective Actions
14. Construction and urban traffic sub-plan	Yes	 <p><i>Provision of traffic signages and barricades</i></p>		
15. Construction drainage sub-plan	Yes	 <p><i>Construction of drainage system</i></p>		



ព្រះរាជាណាចក្រកម្ពុជា
ជាតិ សាសនា ព្រះមហាក្សត្រ

អគ្គនាយកដ្ឋានគាំពារបរិស្ថាន
មន្ទីរពិសោធន៍
LABORATORY

លេខ/N° : ១២៩៧..... ព.ស

ព្រឹត្តិប័ត្រវិនិច្ឆ័យ
ANALYSIS REPORT

ប្រភពនៃគំរូ/Sample Source: **ក្រុមហ៊ុន MTA Construction Co., Ltd**
 កន្លែងយកគំរូ/Survey Point: **គុណភាពខ្យល់ក្នុងទីតាំងគម្រោង Solid Waste Management Improvements ស្ថានីយ៍កំបាំងសំណល់ចម្លើយ សង្កាត់បឹងកក់ ក្រុងសៀមរាប ខេត្តសៀមរាប**
 UTM 48 P 0426544 / 1167641
 ថ្ងៃយកគំរូ/Sampling date: **July 27, 2021**
 រយៈពេលយកគំរូ/Sampling Period: **10:30 AM to 13:40 AM next day**

លរ No	ប៉ារ៉ាម៉ែត្រ Parameter	ធាតុ Unit	លទ្ធផល Result	ស្តង់ដារ Standard	វិធីសាស្ត្រវិនិច្ឆ័យ Reference Method
1	Carbon Monoxide (CO)	mg /m ³	0.294	<20 (8 ម៉ោង)	Method Carbon Monoxide Passive Dosimeter
2	Nitrogen Dioxide (NO2)	mg /m ³	0.014	<0.10 (24 ម៉ោង)	Method Saltzman [ISO 6768:1998(E)]
3	Sulfur Dioxide (SO2)	mg /m ³	0.029	<0.30 (24 ម៉ោង)	Method Pararosaniline [ISO 6767:1980(E)]
4	Methane (CH4)	mg /m ³	ND	-	Method Portable CH4 gas Detector
5	PM10	mg /m ³	0.040	<0.05(24 ម៉ោង)	Method Weight Concentration Measuring
6	PM2.5	mg /m ³	0.021	<0.025(24 ម៉ោង)	Method Weight Concentration Measuring
7	Lead (Pb)	mg /m ³	ND	<0.005(24 ម៉ោង)	Method 3500-Pb C; HNO3,HCl Digestion

សំគាល់៖ 1- បំពង់ពិនិត្យ និងស្ថានីយ៍យកគំរូត្រូវតែត្រួតពិនិត្យគុណភាពខ្យល់ សម្រាប់គម្រោងវិនិច្ឆ័យវិស័យបរិស្ថានរបស់ក្រុមហ៊ុន និងទទួលបានវិញ្ញាបនបត្រគុណភាពខ្យល់ ប្រ.ក.ប លេខ ១១ ថ្ងៃ ខែ ឆ្នាំ ២០២១
 2- ខ្យល់មានល្បឿន 0.3 m/s ដល់ 3.5 m/s

បានឃើញនៅថ្ងៃទី ២៧ ខែ សីហា ឆ្នាំ២០២១
អគ្គនាយក
 Was seen on date:
 Director General



ចេញផ្សាយនៅ ថ្ងៃទី ២៧ ខែ សីហា ឆ្នាំ២០២១
ប្រធានមន្ទីរពិសោធន៍
 Date of Issue:
 Director

[Handwritten Signature]
អូន ឌី

ចេញផ្សាយនៅ ថ្ងៃទី ២៧ ខែ សីហា ឆ្នាំ២០២១
អ្នកវិភាគ
 Analyzer

[Handwritten Signature]



ព្រះរាជាណាចក្រកម្ពុជា
ជាតិ សាសនា ព្រះមហាក្សត្រ

អគ្គនាយកដ្ឋានគាំពារបរិស្ថាន
មជ្ឈមណ្ឌលសាងសង់
LABORATORY

លេខ/N° : ១១៧ ខ ២០២១ ព.ស

ព្រឹត្តិប័ត្រវិភាគ
ANALYSIS REPORT

ប្រភពនៃគំរូ/Sample Source: **ក្រុមហ៊ុន MTA Construction Co., Ltd**
 ទីតាំងយកគំរូ/Survey Point: កម្រិតការបង្កើនគ្រប់គ្រងសំណល់រឹង Solid Waste Management Improvements ភ្នំពេញនៅក្នុងតំបន់បណ្តាញថ្មី សង្កាត់បឹងកេងកង ខេត្តកែប
 UTM 48 P 0426544 / 1167641
 ថ្ងៃយកគំរូ/Sampling date: July 27, 2021
 រយៈពេល/Sampling Period: 10:30 AM to 13:40 AM next day

Survey Period	Noise Level dB(A)				Remarks
	L _{aeq}	Standard (Leq)	L _{max}	L _{min}	
Day	6:00 - 7:00	50.2	75	70.3	46.1
	7:00 - 8:00	46.6		72.3	45.9
	8:00 - 9:00	52.4		71.3	49.6
	9:00 - 10:00	55.2		71.8	54.6
	10:00 - 11:00	60.8		81.6	56.1
	11:00 - 12:00	60.2		82.7	53.8
	12:00 - 13:00	60.7		80.3	57.2
	13:00 - 14:00	60.6		82.8	54.8
	14:00 - 15:00	59.0		79.8	54.2
	15:00 - 16:00	61.5		85.2	53.8
	16:00 - 17:00	61.0		83.3	54.7
	17:00 - 18:00	58.9		82.6	51.0
Evening	18:00 - 19:00	53.0	70	75.9	46.2
	19:00 - 20:00	52.2		73.2	47.3
	20:00 - 21:00	49.4		67.3	47.5
	21:00 - 22:00	51.3		72.6	46.1
Night	22:00 - 23:00	49.4	50	66.8	46.0
	23:00 - 00:00	53.6		67.7	51.5
	00:00 - 1:00	51.1		70.7	45.6
	1:00 - 2:00	56.5		71.0	45.1
	2:00 - 3:00	53.9		69.7	45.2
	3:00 - 4:00	46.2		67.3	44.1
	4:00 - 5:00	45.7		63.7	43.8
	5:00 - 6:00	47.6		70.0	41.2
24 hours Average		54.1		74.1	49.3

កម្រិតសំឡេង បំបែកស្របតាមស្តង់ដារប្រជាជនស្រុកកម្ពុជា សម្រាប់ការប្រកាសពីស្តង់ដារប្រជាជនស្រុកកម្ពុជា និងសម្រាប់ការប្រើប្រាស់ប្រព័ន្ធសំឡេងប្រកាសពីស្តង់ដារប្រជាជនស្រុកកម្ពុជា (Sound Level Meter NL-42/43)

បានឃើញនៅថ្ងៃទី ០៨ ខែ សីហា ឆ្នាំ២០២១
 អគ្គនាយក
 Was seen on date:
 Director General

ប្រកាសថ្ងៃចេញ
 Date of Issue:
 Director

ថ្ងៃចេញនៅថ្ងៃទី ០៨ ខែ សីហា ឆ្នាំ២០២១
 អ្នកវិភាគ
 Analyzer
 Han គង់ សីហា

ហង់ គង់ សីហា



Annex 3. EMP Compliance Matrix - CW01a (Kep-Angkol Coastal Road Improvement Project)


EMP Requirement (Mitigation Measure) pre-construction phase	Compliance & Description (Yes, No, Partial)	Comment or Further Explanation if Needed	Reasons for Not Full Compliance	Corrective Action
PRE-CONSTRUCTION STAGE				
1. Detailed Design	Yes	Climate change was considered. Alignment was kept along the existing road. See wall adopted shallow foundations in order to avoid deep excavations near the sea. The alignment of the new road was defined in such a way to minimize the number of kiosk or stores to be relocated for the road construction.		
2. Disclosure and re-engagement of community	Yes	Reference: IEE		
3. Government approvals	Yes	MoE/DOE project permits and license certificate of EMP report for Coastal Road was issued		
4. Finalize EMP	Yes	The EMP was included in the Bid Document		
5. Confirm Government of Province approved construction sites and place for disposal of wastes from construction	Yes	Only preparatory activity was carried out within the reporting period such as: a) UXO Clearance has been received on 11 February 2022 February and was shared by PMU to ADB on 16 February 2022; b) Revised CEMP was approved by PMCES on 27 January and shared with ADB on 13 February; c) ADB NOL to start works on Resettlement free section was issued on 16 January 2022; d) detailed topographical survey and geotechnical investigations are ongoing on the resettlement free section		
6. UXO survey	Yes	UXO Clearance has been received on 13 February 2022 and was shared by PMU to ADB on 16 February 2022.		
7. Capacity development	Yes			

EMP Requirement (Mitigation Measure) pre-construction phase	Compliance & Description (Yes, No, Partial)	Comment or Further Explanation if Needed	Reasons for Not Full Compliance	Corrective Action
8. Recruitment of workers	Yes	Considered in the CEMP		
9. CEMP	Yes	Revised draft of CEMP resubmitted to PMCES/PMU was approved on 27 January 2022		
CONSTRUCTION PHASE⁶				
10. Air, dust noise and vibration subplan		The construction activities for the Kep-Angkol Coastal Road Improvement - CW01A will officially start on 24 January 2022. No construction activity carried out during the reporting period. The following EMP requirements will be assessed in the next reporting period Jan-June 2022.		
11. Water quality control				
12. Erosion control subplan				
13. Mangrove, Birds, wildlife, Tree and vegetation removal, and site restoration sub-plan				
14. Worker camps				
15. Construction materials acquisition,				

⁶ For future monitoring.

EMP Requirement (Mitigation Measure) pre-construction phase	Compliance & Description (Yes, No, Partial)	Comment or Further Explanation if Needed	Reasons for Not Full Compliance	Corrective Action
transport, and storage sub-plan				
16. spoil management subplan				
17. Solid and liquid construction waste subplan				
18. Implement utility and power disruption sub- plan				
19. worker and public safety sub-plan				
20. Cultural chance finds sub-plan				
21. Construction and urban traffic subplan				
22. Construction drainage sub-plan				

Annex 4. EMP Compliance CW02a (Koh Tonsay Passenger Pier)

EMP Requirement (Mitigation Measure)	Compliance & Description (Yes, No, Partial)	Comment or Further Explanation if Needed	Reasons for Not Full Compliance	Corrective action
PRE-CONSTRUCTION STAGE				
1. Disclosure and re-engagement of community	Yes			
2. Government approval	Yes	Geotechnical investigations carried out. Environmental license for Koh Tonsay Passenger Pier - CW02a issued on 30 May 2021		
3. Detailed design	Yes			
4. Finalize EMP	Yes			
5. Confirm Government of Province approved construction wastes disposal sites	Yes			
6. UXO Clearance	yes			

EMP Requirement (Mitigation Measure)	Compliance & Description (Yes, No, Partial)	Comment or Further Explanation if Needed	Reasons for Not Full Compliance	Corrective action
		<p>UXO Detection activities for the Koh Tonsay Passenger Pier Subproject, 02 Nov 2021.</p> <p>UXO clearance was approved by PMCES/ PMU (12 November 2021) and transmitted to ADB on 13 November 2021.</p>		
7. Permits and licences	Yes	Environmental license for Koh Tonsay Passenger Pier - CW02a was issued on 30 May 2021		
8. Capacity development	Yes	Considered in IEE (2021 Aug) and EMP		
9. Recruitment of workers	Yes			
10. CEMP	Yes	CEMP (2021 September), approved by PMCES/ PMU (12 November 2021) and transmitted to on 13 November 2021		
CONSTRUCTION PHASE⁷				
11. Air, dust noise and vibration subplan		Only geotechnical investigations; some land clearing on the part of the walkway (180m) and workers camp and building of a rockfill-earthwork provisional landing facility to allow the approach to land of the barge for transportation of equipment and materials from the mainland. The following EMP requirements will be assessed in the next reporting period Jan-June 2022.		
12. Water quality control				
13. Erosion control subplan				

⁷ For future monitoring.

EMP Requirement (Mitigation Measure)	Compliance & Description (Yes, No, Partial)	Comment or Further Explanation if Needed	Reasons for Not Full Compliance	Corrective action
14. Mangrove, Birds, wildlife, Tree and vegetation removal, and site restoration sub-plan				
15. Worker camps	Yes			
16. Construction materials acquisition, transport, and storage sub-plan				
17. spoil management subplan				
18. Solid and liquid construction waste subplan				
19. Implement utility and power disruption sub-plan				
20. worker and public safety sub-plan				
21. Cultural chance finds sub-plan				
22. Construction and urban traffic subplan				

EMP Requirement (Mitigation Measure)	Compliance & Description (Yes, No, Partial)	Comment or Further Explanation if Needed	Reasons for Not Full Compliance	Corrective action
23. Construction drainage sub-plan				

Annex 5. CW03 Training Report 2022 Feb 01