

# Environmental Management Plan

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February 2022

Cambodia: Second Greater Mekong Subregion Corridor  
Towns Development Project

CW02: Construction of Kampot Landfill

Prepared by the Ministry of Public Works and Transport for the Asian Development Bank.  
This is an updated version of the draft originally posted in December 2021 available on  
<https://www.adb.org/projects/documents/cam-46443-002-emp-5>.

## ABBREVIATIONS

ADB	-	Asian Development Bank
AP	-	Affected people
CEMP	-	Contractor Environmental Management Plan
C-EHS	-	Contractor Environmental, Health and Safety Officer
EA	-	Executing Agency
EMP	-	Environment Management Plan
ESO	-	Environment Safeguards Officer
ESC	-	Environment Safeguards Counterpart
EMR	-	Environmental Monitoring Report
GRC	-	Grievance Redress Committee
GRM	-	Grievance Redress Mechanism
GPS	-	Global Positioning System
IEE	-	Initial Environment Examination
IESIA	-	Initial Environment and Social Impact Assessment
I/NES	-	International and National Environmental Specialists
PISCB	-	Project Implementation Support and Capacity Building Consultants
PDoE	-	Provincial Department of Environment
PIU	-	Project Implementation Unit
PMU	-	Project Management Unit
PSC	-	Project Steering Committee
MOE	-	Ministry of Environment
MPWT	-	Ministry of Public Works and Transport
PSC	-	Project Steering Committee
PDPWT	-	Provincial Department of Public Work and Transportation
SPS	-	ADB's safeguard policy statement (2009)

## WEIGHTS AND MEASURES

kph - kilometer per hour

## **NOTE**

- (i) In this report, "\$" refers to US dollars.

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## I. INTRODUCTION

### 1.1 Purpose

1. This document is the environmental management plan (EMP) for the construction of an engineered municipal solid waste landfill subproject in Kampot city, Kampot province, Cambodia. It is a subproject under the Second Greater Mekong Sub-region Corridor Towns Development Project (the project). The Initial Environmental Examination (IEE) which covers the Kampot landfill subproject is in a separate document.
2. This EMP defines mitigation and monitoring measures and describes the institutions, responsibilities and mechanisms to monitor and ensure compliance. Such institutions and mechanisms will seek to ensure continuous improvement of environmental protection activities during preconstruction, construction, and operation of the sub-projects in order to prevent, reduce, or mitigate adverse impacts.
3. This EMP includes an update for CW/02 Variation Order 1, which covers a change in the landfill and leachate pond liner techniques and the construction and widening of the landfill access road (3km). The EMP includes two amended mitigation measures, specified by the Ministry of Environment in the domestic Initial Environmental and Social Impact Assessment. This EMP also remains valid for CW02/VO2 upgrades to the landfill internal roads. CW02/VO2 did not require any existing mitigation measures to be changed.
4. The contractor is required to complete a Construction Environmental Management Plan (CEMP) based on this EMP. Construction can start only when the CEMP is formally approved by the PMU.

### 1.2 Budget

5. The costs for EMP implementation comprise:
  - Training and Capacity Building : \$2764 (See Table 8)
  - Household landfill protection measures: \$8,000 (See Table 9)
  - Environmental Quality Monitoring: Pre-Construction \$6,500 (Costs are included in domestic Initial Environment and Social Impact Assessment (IESIA)) (See Table 10)
  - During Construction per year \$18,700 (see Table 12) (See Table 10)
  - Under CW02/VO1 Compensation planting (landfill access road) 300 native trees x \$25 (minimum height 1m) \$7,500 within road right of way (which is 30m wide) to be planted by the contractor prior to hand-over.
  - Under CW02/VO1 Speed warning signs (x 2 in both directions, total x 4) to be installed along the improved section of the commune road by the construction contractor prior to hand-over \$1000.
6. Other aspects of the EMP including mitigation measures, reporting, affected people consultation and EMP monitoring are included in other budgets depending on the organization responsible for the aspect e.g. Project Management Unit (PMU) operational budget or included in contractor's bid price.

### 1.3 Legal Standards

7. This project is subject to ADB's Safeguards Policy Statement which requires the contractor to follow the most stringent standards from national legislation or international standards. The following standards apply to this EMP, set out in Table 1 to Table 3:

Table 1. Key national environmental standards

Environmental Issue	National Standard	International Standard
Ambient air quality	Sub-decree No. 42 on Control of Air Pollution and Noise Disturbance, 2000 Annex 1, Ambient Air Quality Standard	WHO Air Quality Guidelines, global update 2005
Noise	Sub-decree No. 42 on Control of Air Pollution and Noise Disturbance, 2000 Annex 6 of Standard, Max. Standard of Noise Level Allowable in the Public and Residential Areas, of	WHO Guidelines for Community Noise, 1999
Groundwater quality	Drinking water Quality Standards, 2004	WHO Guidelines for Drinking-water Quality, Fourth Edition, 2011
Surface water quality	Sub-decree No. 27 on Water Pollution Control, 1999  Annex 4 of Standard, Water Quality Standards for Public Waters for the Purpose of Biodiversity Conservation, and Annex 5, Water Quality Standards for Public Waters and Health	US EPA National Recommended Water Quality Criteria Mekong River Commission (MRC)_ Technical Guidelines for the Protection of Aquatic Life MRC Technical Guidelines for the Protection of Human Health
Effluent quality (including leachate)	Sub-decree No. 27 on Water Pollution Control, 1999  Annex 2 of Standard, Effluent standard (Protected Public Water Area standard),	EHS General Guidelines and Guidelines for Water and Sanitation

Table 2. Noise level guidelines used by WHO and Cambodia

Standard and Receptor	L <sub>aeq</sub> (dBA)		
	Day 07:00 – 22:00	Night 22:00 – 07:00	
<b>WHO guidelines: Residential, institutional or educational</b>	55	45	
<b>WHO guidelines: Industrial, commercial</b>	70	70	
Standard and Receptor	dBA		
	Day 06:00-18:00	Evening 18:00-22:00	Night 22:00-06:00
<b>Cambodian standards: Educational and Health</b>	45	40	35
<b>Cambodian standards: Residential</b>	60	50	45
<b>Cambodian standards: Commercial</b>	70	65	50

Source: WHO (1999), Guidelines for Community Noise. Notes: Guidelines values are for noise levels measured out of doors. L<sub>aeq</sub>: A-weighted, equivalent sound level. dBA: A-weighted decibel

Table 3. Noise level guidelines used by WHO and Cambodia

Pollutant	Averaging Period	Cambodian Standards (µg/m <sup>3</sup> )	Averaging Period	WHO Ambient Air Quality Guidelines (µg/m <sup>3</sup> )
<b>Sulphur Dioxide (SO<sub>2</sub>)</b>	1 hour	500	10 min	500
	24 hour	300	24 hour	20
	Annual	100		
<b>Nitrogen Dioxide (NO<sub>2</sub>)</b>	1 hour	300	1 hour	40
	24 hour	100		
			Annual	40
<b>Carbon Monoxide (CO)</b>	1 hour	40,000		
	8 hour	20,000		
<b>Ozone (O<sub>3</sub>)</b>	1 hour	200	8 hour	100
<b>Lead (Pb)</b>	24 hour	5		

Pollutant	Averaging Period	Cambodian Standards ( $\mu\text{g}/\text{m}^3$ )	Averaging Period	WHO Ambient Air Quality Guidelines ( $\mu\text{g}/\text{m}^3$ )
Total suspended particles	24 hour	330		
	Annual	100		
Fine particulate matter (PM2.5)			24 hour	25
			Annual	10
Coarse particulate matter (PM10)			24 hour	50
			Annual	20

Table 4. Effluent Standards from Sub-Decree on Water Pollution Control (1999)

Parameter	Unit	Allowable limits for pollutant substance discharging to:	
		Protected public water area <sup>1</sup>	Public water area <sup>2</sup> and sewer
Temperature	$^{\circ}\text{C}$	< 45	< 45
pH	-	6 – 9	5 - 9
BOD5 ( 5 days at 200 C )	mg/l	< 30	< 80
COD	mg/l	< 50	< 100
Total Suspended Solids	mg/l	< 50	< 80
Total Dissolved Solids	mg/l	< 1000	< 2000
Grease and Oil	mg/l	< 5.0	< 15
Detergents	mg/l	< 5.0	< 15
Phenols	mg/l	< 0.1	< 1.2
Nitrate (NO3 )	mg/l	< 10	< 20
Chlorine ( free )	mg/l	< 1.0	< 2.0
Chloride ( ion )	mg/l	< 500	< 700
Sulphate ( as SO4 )	mg/l	< 300	< 500

## II. SUMMARY OF POTENTIAL RECEPTORS & IMPACTS

8. The impacts of the project are influenced by the presence of receptors in the sub-project area. Without receptors, there will not be any impacts. The receptors are summarized in Table 5 and a map is shown in Figure 1.

9. In addition to these site specific receptors, housing, businesses and access requirements are also considered impact receptors.

Table 5 Receptors in Sub-Project Area

Receptors	Description	GPS Co-Ordinate
Socio-Economic	5 houses within 500m of landfill centre	
	Property 1) 10m from boundary Property 2) 56m from boundary Property 3) 54m from boundary Property 4) 78m from boundary Property 5) 140m from boundary Commune road users Housing up to 840m along access road from National Road #3	10° 42.388'N, 104° 13.008'E 10° 42.567'N, 104° 13.119'E 10° 42.355'N, 104° 12.929'E 10° 42.499'N, 104° 12.863'E 10° 42.291'N, 104° 13.006'E
Surface water	Numerous ponds for agricultural use	

<sup>1</sup> Protected public water area refers to any public water areas that are protected for the purpose of biodiversity conservation and so on.

<sup>2</sup> Public water area refers to water areas that are for public use such river, stream, gully, lake, pond, well, sea, river mouth and include canal irrigation system and other waterways including ground water.

## Kampot Landfill: EMP

	Pond 1 Pond 2 Pond 3	10° 42.345'N, 104° 12.917'E 10° 42.578'N, 104° 12.987'E 10° 42.512'N, 104° 12.838'E
Ecological	Scrub and secondary growth such as acacia trees mimosa and grasses Access road: 100 trees and under storey vegetation	
Cultural	Wat Pou 124m from access road	10° 40.140'N, 104° 12.750'E

Source: PISCB Team

Figure 1. Kampot Landfill Receptors Map



Source: PISCB Team

10. A summary of impacts on the receptors is presented below:

### Construction Phase Impacts:

- **Air Quality.** Moderate temporary air quality impacts during the construction stage of the project are anticipated because of fugitive dust generation associated with all construction works, and earth works. Odor will be an impact during landfill operation.
- **Noise.** Noise impacts will be temporary and localized at all construction sites as construction machinery and vehicles generate noise as they operate. Other noise sources include loading and unloading of equipment and materials and excavation. Noise from operation will arise from machinery use for waste placement.
- **Solid waste management.** Impacts on resource use and impacts associated with disposal will arise from waste generated during construction. This includes generation of inert wastes e.g. spoil, biodegradable wastes e.g. cleared vegetation, and hazardous wastes e.g. oily wastes.
- **Community and Occupational Health and Safety.** Construction sites and access roads will necessarily mean health and safety risks not only to construction workers, but also to people living and working around the landfill construction site and access roads. Community risks come from unauthorized access to construction sites and



construction traffic i.e. heavy vehicles which the community may not be used to on their neighborhood roads and changes in road priorities for traffic movements and potential increased vehicle speeds on the improved road. Occupational risks come from a range of activities including the use of heavy machinery for earth moving.

- **Flora.** Some minor impacts through loss of ecosystem services from vegetation removed during landfill clearance and access road widening including tree removal.

Operation Phase Impacts:

- **Ground water.** All landfills have potential to pollute groundwater if not properly maintained during operation, with contamination arising from leachate percolation into the water table.
- **Occupational Health and Safety.** Landfill operations staff will be exposed to risks associated with waste such as the risk of respiratory illness from bioaerosols, infection from poor hygiene and physical injury such as needle stick incidents or risks associated with the use of bulldozers or compactors on the tipping face.

### III. IMPLEMENTATION ROLES & RESPONSIBILITIES

11. The key institutions, organizations and stakeholders relevant to environmental safeguards are set out below.

12. The overall responsibility for EMP implementation and compliance with loan assurances lies with the Executing Agency, the Ministry of Public Works and Transport. The EA has established a Project Management Unit (PMU) based in Phnom Penh, responsible for general project implementation. The Implementing Agency is the Provincial Department of Public Works and Transport (PDPWT) in sub-project city. The PDPWT has established a Project Implementation Unit (PIU) in Kampot, comprising relevant provincial government representatives including the Provincial Department of the Environment.

13. A summary of the key functions for project implementation and environmental safeguards is presented in Table 2 and detail on the responsibilities of each function is in Table 7.. To date the PMU has assigned a named Ministry of Public Works and Transport (MPWT) engineer with environmental and social safeguard experience to the role of PMU-ESO and a staff member has been nominated and named for the PIU-ESC role<sup>3</sup>.

**Table 6 Key Functions for Project Implementation**

Role	Abbreviation	Location	Summary of Overall Function
Project Steering Committee	PSC	Phnom Penh	Policy and technical guidance for subproject implementation
Project Management Unit	PMU	Phnom Penh within MPWT	Responsible for general project implementation and reporting
PMU Environment Safeguards Officer	PMU-ESO	Phnom Penh within PMU	Existing MPWT staff seconded/assigned to the PMU for the environmental management of the Project EMP compliance across the sub-projects for environmental safeguards – Full Time
Project Implementation Unit	PIU	Provinces within PDPWT	Responsible for sub-project implementation
PIU Environmental Safeguard Counterpart	PIU-ESC	Provinces within PIU	Nominated person responsible for sub-project environmental monitoring and support to PMU-ESO
Contractor Environmental, Health and Safety Officer	C-EHS	Construction Site	Mitigation measure implementation and reporting

<sup>3</sup> All PMU and PIU staff are named in Prakas No. 149 (21 March 2016) on the Establishment of Project Management Unity for 2<sup>nd</sup> Corridor Town Development Project under ADB’s Loan by MPWT

## Kampot Landfill: EMP

Project Implementation Support & Capacity Building Consultants	PISCB	Phnom Penh	Project final design and implementation, support and capacity development Engineering supervision for all construction and reporting through engagement of a PISCB Construction Supervision Consultant (PISCB-CSC)
PISCB National Environment Specialist x1 and International Environment Specialist x1	PISCB -I/NES	Phnom Penh within PISCB team	Environmental safeguards and reporting support during design and implementation – Both roles Intermittent
Asian Development Bank	ADB	-	Review project progress, compliance with covenants and advise on corrective actions

Table 7: Environmental Safeguards Implementation Responsibilities

Institution	Prior to Construction including Detailed Engineering Design	During Construction	During Operation and Decommissioning
Executing Agency	<ul style="list-style-type: none"> <li>Ministry of Public Works and Transport responsible for ensuring the implementation of the mitigation in the EMP and for ensuring compliance with loan covenants</li> <li>Collaborate with the Ministry of Environment (MoE) for the Subproject's compliance with the Government's environmental safeguard requirements on IESIA and EMP implementation</li> </ul>		
PSC	<ul style="list-style-type: none"> <li>Oversee implementation in conformity with the Project's development objectives and scope</li> <li>Assist in coordination among government agencies involved in Project implementation including MoE</li> <li>Ensure coordinated and efficient Project implementation activities including EMP implementation</li> </ul>		
PDPWT	Collaborate with Provincial Department of Environment (PDOE) & relevant provincial agencies on matters concerning the environmental management of the Subproject.		
PMU / PMU-ESO	<ul style="list-style-type: none"> <li>Update IEE &amp; EMP</li> <li>Coordinate with Design Consultant to ensure the incorporation of updated findings &amp; mitigation measures in design &amp; bidding documents.</li> <li>Ensure EMP is part of the bidding documents, EMP clauses are incorporated in bidding documents, contracts.</li> <li>Ensure MoE approval of IESIA Report has been secured prior to awarding of civil works.</li> <li>Review contractor's Construction EMP (C-EMP) against ADB and IESIA requirements</li> <li>Conduct affected people consultation</li> <li>Participate in training provided by PISCB</li> </ul>	<ul style="list-style-type: none"> <li>Conduct inspections and spot checks to monitor the performance of the Contractor in implementing the C-EMP/EMP</li> <li>EMP implementation site visits</li> <li>Review environmental quality monitoring results.</li> <li>Prepare the Project's Semi-Annual environmental Monitoring Reports for submission to ADB.</li> <li>Implement the Grievance Redress Mechanism (GRM) for environmental issues</li> <li>Conduct appropriate consultation and monitoring of effect of construction on affected people</li> <li>Participate in training provided by PISCB</li> </ul>	<ul style="list-style-type: none"> <li>Review relevant operator monitoring reports.</li> <li>Prepare the Project's Annual Environmental Monitoring Report (EMR) for submission to ADB, until loan closure or as agreed.</li> <li>Ensure all GRM complaints are closed out to affect person's satisfaction</li> </ul>
PIU-ESC	<ul style="list-style-type: none"> <li>Coordinate and collaborate relevant provincial agencies, as necessary</li> <li>Support PMU-ESO</li> <li>Conduct affected people consultation</li> <li>Prepare draft Semi-Annual EMR. Submit to PMU for finalization for Project's EMR.</li> <li>Establish GRM for Environmental Issues</li> <li>Participate in training provided by PISCB</li> </ul>	<ul style="list-style-type: none"> <li>Collate monthly EMRs of Contractor, and submit to the PMU.</li> <li>Monthly Site Visits in collaboration with PISCB / CSC to                             <ul style="list-style-type: none"> <li>1) Review &amp; verify Contractor's Monthly EMP Progress Reports</li> <li>2) Consult affected people,</li> </ul> </li> <li>If a licensed laboratory will be engaged to do independent environmental quality monitoring, oversee &amp; manage the quarterly conduct of the environmental effects monitoring</li> <li>Prepare the draft Semi-Annual EMR and submit to the PMU for finalization and incorporation to the Project's Semi-Annual EMR.</li> <li>Implement the GRM for environmental issues</li> <li>Participate in training provided by PISCB</li> </ul>	<ul style="list-style-type: none"> <li>Review relevant operator monitoring reports</li> <li>Support reporting requirements of PMU.</li> <li>Ensure all GRM complaints are closed out to affect person's satisfaction</li> </ul>
PISCB-N/IES	<ul style="list-style-type: none"> <li>Provide technical advice/assistance, IEE/EMP update</li> <li>Review bidding documents, review C-EMP against the EMP; confirm subproject readiness.</li> <li>Ensure environmental considerations included in Detailed Design</li> </ul>	<ul style="list-style-type: none"> <li>Provide technical advice/assistance, e.g., preparation of Semi-Annual EMR for ADB, review of results of environmental effects monitoring.</li> <li>Environmental related training for PMU, PIU, contractors and other stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Organize, prior to project completion report mission, a survey to assess community satisfaction with project implementation and EMP implementation performance. Draft environment sections of the project completion report.</li> </ul>

## Kampot Landfill: EMP

	<ul style="list-style-type: none"> <li>Environmental related training for PMU, PIU, contractors and other stakeholders</li> <li>Incorporate mitigation measures in design &amp; bidding documents</li> <li>Incorporate EMP as part of bidding documents, EMP clauses in bidding documents, contracts</li> <li>Support PMU/PIU with appropriate consultation</li> </ul>	<ul style="list-style-type: none"> <li>Support PMU/PIU with appropriate consultation</li> <li>Site visits to check on construction, EMP implementation and affected people, in collaboration with PIU</li> </ul>	
ADB	<ul style="list-style-type: none"> <li>Review and clear updated IEE/EMP</li> <li>Review bidding documents, clear C-EMP, confirm readiness of subproject.</li> </ul>	<ul style="list-style-type: none"> <li>Review Project EMRs.</li> <li>Carry out review missions</li> </ul>	
Contractor	<ul style="list-style-type: none"> <li>Prepare a C-EMP that addresses as minimum the requirements of the EMP.</li> </ul>	<ul style="list-style-type: none"> <li>Appoint a qualified Environment Health and Safety (C-EHS) staff member to be responsible for EMP implementation and reporting</li> <li>Implement mitigation measures &amp; conduct internal EMP implementation monitoring.</li> <li>Conduct environmental quality monitoring as prescribed in SPS-compliant EMP. (If an independent Licensed Laboratory will not be engaged.)</li> <li>Prepare Monthly Report on EMP implementation</li> </ul>	
Construction Supervision Company (CSC)	<ul style="list-style-type: none"> <li>Appointed under PISCB contract</li> </ul>	<ul style="list-style-type: none"> <li>Support to PIU with site visits for EMP verification</li> </ul>	
Operator			<ul style="list-style-type: none"> <li>Implement mitigation measures &amp; conduct internal EMP implementation monitoring.</li> <li>Prepare Monthly and Annual EMRs.</li> </ul>
Licensed Lab (if used)	<ul style="list-style-type: none"> <li>Conduct environmental quality monitoring as prescribed in the EMP</li> </ul>		<ul style="list-style-type: none"> <li>Conduct monitoring as specified by the operator</li> </ul>
MoE/PDoE	<ul style="list-style-type: none"> <li>Review, comment on approve IESIA Report</li> </ul>	<ul style="list-style-type: none"> <li>Monitor compliance with approved IESIA &amp; EMP.</li> </ul>	<ul style="list-style-type: none"> <li>Monitor compliance with environmental standards.</li> </ul>
Municipality	<ul style="list-style-type: none"> <li>Facilitate obtaining the necessary inputs from and/or participation/cooperation of, concerned communes and villages through collaboration with their Commune Councils.</li> <li>Facilitate (&amp; participate in) GRM dissemination and implementation</li> </ul>	<ul style="list-style-type: none"> <li>Participate in the monitoring of the performance of Contractor in EMP implementation.</li> <li>Review EMRs &amp; results of environmental effects monitoring</li> <li>Facilitate &amp; participate in GRM dissemination and implementation.</li> </ul>	
Commune Councils	<ul style="list-style-type: none"> <li>Facilitate &amp; participate in GRM dissemination and implementation</li> </ul>	<ul style="list-style-type: none"> <li>Participate in the monitoring of the performance of Contractor in EMP implementation.</li> <li>Review EMRs &amp; results of environmental effects monitoring.</li> <li>Facilitate &amp; participate in GRM dissemination and implementation.</li> </ul>	

### 3.1 Institutional Capacity Review and Needs

14. A training program is set out in Table 8 which addresses the safeguard reporting and implementation requirements during construction, and the environmental and social risks from operations.

15. The PISCB-I/NES will perform key roles in supporting the PMU-ESO in implementing the EMP and ensuring the pre-construction requirements are in place.

16. The Contractor will also deliver adequate training to his/her own staff, as specified in the EMP. Training will include:

- Daily toolbox meetings (safety briefings)
- Education and awareness seminars for construction hazards
- HIV Aids education awareness
- Cambodian laws for foreign labor including hunting, fishing and traffic rules
- Grievance Redress Mechanism – how to deal with affected people who make a complaint to a worker
- Occupational Health and Safety and Emergency Procedures

Table 8: Capacity building and training requirement

Subject / Content	Participants	Trainer/Organization	When/Frequency	Days / event	# of participants	Cost (\$) USD
<b>CEMP development and implementation</b> CEMP function Roles and responsibilities, CEMP monitoring (Site Visits) Reporting on Environmental Safeguards	PMU, PIU, contractors	PISCB -I/NES	Twice - Once before, and once 6 months after construction starts	2	10	2764
<b>Consultation with Affected People &amp; GRM*</b> Consulting during construction, types of consultation, methods	PMU, PIU, contractor	PISCB -I/NES	Once before to construction	0.5	6	
<b>Grievance Redress Mechanism *</b> – roles, responsibilities and implementation	PMU, PIU, contractors, Commune Councils	PISCB -I/NES	Twice - Once before, and once 6 months after construction starts	1	10	
<b>Environmental monitoring</b> -Monitoring methods, data collection and processing, reporting systems	PMU, PIU, contractors,	PISCB -I/NES & MoE (environmental analyst)	Once (at beginning of project construction)	1	10	
<b>Livelihoods Related Training</b>	PISCB Package 2 includes income related training for waste pickers at Kampot dumpsite under the Vocational Skills Training and Livelihood Program for Waste Pickers, Poor Young Women, Youth and Project Affected Persons					
* GRM training has been provided for PMU, PIU already under the Kampot Drainage and WWTP subproject. Contractors for this subproject will be given GRM training.						

## IV. MITIGATION PLAN

18. The mitigation measures of the EMP are presented in the mitigation plan for the subproject in Table 6. The mitigation plan is organized by the pre-construction; construction; and post construction / operational phase.. The mitigation plan addresses the environmental issues and concerns raised at the stakeholder meetings. Domestic Ministry of Environment requirements from the IESIA are included in this table.

19. Construction Environmental Management Plan. The Contractor is expected to develop a Construction Environmental Management Plan (C-EMP) based on Table 9 which represents minimum mitigation measure requirements for construction contractors. The Contractor will also provide detailed activity specific sub-plans which set out the contractor's approach to mitigating the highest risks, as identified by the Environmental Impacts section of the IEE or those impacts which are best monitored through provision of a detailed map.

**Table 9: EMP mitigation Measures**

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Estimated Cost <sup>4</sup> (\$)	Responsibility	
				Implementation	Supervision
<b>PRE-CONSTRUCTION</b>					
Disclosure, & engagement of community	No community impacts	1. Initiate Information Disclosure and confirm existing project GRM process is functioning 2. Specific discussion on household protection measures for 5 households within 300m of the site 3. Provision of disclosed information to owners of buildings identified along access road and engagement in discussion on project construction.	Include in project cost	PIU/PISCB National Environmental Consultant	PMU
GRM Dissemination	-	4. Provide contractor with GRM contact details to be used for: A. GRM sign boards B. GRM Contact Cards for Affected People	Included in Project cost	PMU	PMU
		5. Erect sign boards at the construction site entrance with: A. Project details B. GRM procedures and contact details 6. Print 'GRM Contact Cards' for all workers to give to complainants and keep cards with all vehicles, machinery and site managers/foremen 7. Affected People Training. Contractor to raise awareness of all workers on how to respond when an affected person or member of the public has a complaint i.e. direct the person to the most senior site manager present at the time and provide a 'GRM Contact Card'	Included in Bid Price	Contractor	PMU
Construction EMP (C-EMP)	All	8. The contractor(s) will develop a Construction EMP (C-EMP) that includes the mitigation measures set out in this table as a minimum and will include detailed individual management sub-plans for: A. Solid and Liquid Waste Management; B. Occupational Health and Safety Plan – Accident Prevention and	Included in Bid price	Contractor (C-EHS)	PMU/ PISCB

<sup>4</sup> Costs will need to be updated during detailed design phase

Kampot Landfill: EMP

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Estimated Cost <sup>4</sup> (\$)	Responsibility	
				Implementation	Supervision
		<p>Emergency Response; C. Construction Workers and Camp Management (if required) and.</p> <p>9. The CEMP will include a map of each construction site, with copies held by the Contractor and PIU, showing as a minimum:</p> <p>a). Access routes, b). storage areas for waste, c). storage area for chemicals and fuels, d) concrete and asphalt mixing, e) stockpile storage areas (on &amp; off site), f) first aid kit and equipment used in emergency response, g) location of worker camps (if required) h) staging areas.</p>			
Obtain & activate permits and licenses	Compliance obligations	10. Contractors to comply with all statutory requirements set out by Government for use of construction equipment, and operation construction plants.	Include in bid price	Contractor	PMU
UXO CLEARANCE	-	<p>11. Obtain clearance from the Military confirming that no UXO is present in the project sites as required by Bill of Quantities and Construction Contract.</p> <p>12. Obtain confirmation from the Military or relevant Mine Clearance institution that the Access Road widening alignment is also clear of UXO. – prior to any road construction activities taking place.</p>	Included in Bill of Quantities	Military	PMU
Construction EMP (CEMP) Approvals	All	13. Approval of C-EMP and individual sub-plans including site maps as required by CEMP.	Include in Project cost	PMU/ PISCB	EA
All activities from construction to decommissioning	Environment and Health and Safety	<p>14. IFC Guidelines for Environment Health and Safety represent international good practice will be considered throughout construction. These guidelines contain section on 1) Waste Management and 2) Construction and Decommissioning.</p> <p>15. IFC Guidelines are available for the Contractor to follow here in languages including English, Chinese and Vietnamese: <a href="https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/ehs-guidelines">https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/ehs-guidelines</a></p>	Include in bid price	Contractor	PMU
<b>CONSTRUCTION PHASE</b>					
Household protection measures	Nuisance issues (dust, Odor, pests)	<p>16. For all 5 households 0-300 m of the landfill site that want to accept mitigation measures:</p> <p>a) Installation of opening glass window frames and fly screens into a maximum of 8 windows within the house.</p> <p>b) Provision of 50 viable tree or shrub saplings (native species, to be determined through consultation) to provide a vegetation screen around the front or back, and sides of the property; the resident is responsible for aftercare.</p> <p>17. Installation of the above <b>within the first 3 months</b> of construction</p>	\$8,000	Contractor	PIU/PMU/ PISCB



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Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Estimated Cost <sup>4</sup> (\$)	Responsibility	
				Implementation	Supervision
		contract agreement to offer protection from construction impacts.			
Establish Construction staging areas		18. No construction staging areas to be located within 20m of any water course 19. Map of staging area to be provided as part of CEMP	Include in bid price	Contractor	PIU/PMU
Earthworks and General Civil Works	Noise and Dust and pollution	20. Water will be sprayed at least twice per day on construction sites, material handling areas when fugitive dust is noticeably generated. 21. Any topsoil and overburden removed should be stockpiled for later restoration 22. Trained traffic marshals will be used to direct large construction vehicle movements when entering public roads. 23. Contaminated spoil disposal must be tested for contaminants then follow Government regulations including handling, transport, treatment (if necessary), and disposal and will be isolated from human contact and environmental receptors by plastic sheeting or similar. 24. Strict construction hours will be observed from 8am to 5pm 25. The contractor will ensure adequate road safety signs and road surface to allow the community safe access and use of the community road at all times during access road construction. (Also see Community Health, Safety and Access mitigation measures below).	Include in bid price	Contractor	PIU/PMU
Implementation of Solid and Liquid Waste Management Sub-Plan A	Contamination of land and surface waters from construction waste	26. Sub-plan will include measures to explain how the contractor will: a) Manage general solid and liquid waste from construction in line with Government regulations, and will cover, collection, handling, transport, recycling, and disposal of waste created from construction activities and worker force. b) Make clear arrangements for storage and transportation of all hazardous and non-hazardous waste to an authorized and approved disposal point (approved by Provincial Department of Environment). c) Segregate recyclables at source and given/sold to recycler (plastic, metal, card, paper as a minimum) d) Store all solid waste in containers with lids, more than 25 m from all surface water, water supplies, and cultural and ecological sensitive receptors. e) Prohibit burning of waste at all times; f) Provide all vehicles/drivers with plastic bags for waste collection and prevent any unauthorized waste disposal with particular attention paid to prevention of waste entering water ways including drainage ditches g) Provide a schedule of solid and liquid waste pickup and disposal must be established and followed that ensures construction sites are as clean as possible. h) All spills must be cleaned up completely with all contaminated soil removed and handled in accordance with waste legislation requirements.	Included in bid price	Contractor	PIU/ PMU
Implementation of	Human health	27. Occupational <b>H&amp;S measures</b> to be included in the management sub-plan will include:	Included in bid price	Contractor	PIU/ PMU

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Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Estimated Cost <sup>4</sup> (\$)	Responsibility	
				Implementation	Supervision
Occupational Health and Safety: Prevention and Emergency Response Sub-Plan B	and safety	<p>a) Assurance that all workers are equipped with, and use Personal Protective Equipment (PPE).</p> <p>b) Specifications for the PPE to be used on site and the contractors' approach to enforcement of its use by workers</p> <p>c) Sufficient signage giving occupational health and safety warnings and information disclosure within all construction sites – sub-plan to include example warnings.</p> <p>d) Details of worker education and awareness seminars for construction hazards will be given. A construction site safety program will be developed and distributed to workers.</p> <p>e) Details of daily toolbox meetings (safety briefings)</p> <p>f) Details of the site accident record book which will be maintained where all major or minor accidents and incidents are recorded with actions taken.</p> <p>g) An Environment Health and Safety qualified engineer or staff member will be engaged for the contract and adequate first aid equipment provided on site.</p> <p>h) All spillages on public roads will be removed immediately.</p> <p>i) Drinking water must be provided at all construction sites</p> <p>28. <b>Accident and Incident Prevention Plan</b> will set out detailed Preventative Measures for all types of incidents covered in the Emergency Plan. This will include:</p> <p>j) Prevention of Injury and Accidents – to include Personal Protective Equipment requirements for construction workers, training requirements</p> <p>k) Prevention of Spillage - All construction fluids such as oils, and fuels will be stored on hard standing with sealed drainage with a capacity of 110% of the largest fuel container, will include procedures on refueling and maintaining vehicles.</p> <p>l) Prevention of Fire – to include measures for Ignition Sources including prevention of smoking on construction site, management of flammable materials and liquid.</p> <p>m) Other Incidents – prevention measures relevant to other issues considered relevant by the contractor</p> <p>29. The Contractor will develop <b>Emergency Response Procedures</b> prior to construction. The procedures will cover actions to be taken in case of:</p> <p>n) Worker injury (e.g. construction or traffic accident)</p> <p>o) Spillage (e.g. fuel spillage)</p> <p>p) Fire (e.g. fuel or chemicals storage area); and</p> <p>q) Any other incidents anticipated by the contractor.</p> <p>30. The contractor will follow the additional COVID-19 requirements set out in</p>			

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Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Estimated Cost <sup>4</sup> (\$)	Responsibility	
				Implementation	Supervision
		the SUPPLEMENTARY TABLE A below.			
Implementation of Construction Workers and Camp Management	Contamination of water, soil, waste production and social issues	<p>31. The contractor will give priority to local labor force and retain evidence of how local labor recruitment efforts were undertaken</p> <p>If a construction camp is used:</p> <p>32. The contractor will follow the additional Worker Camp Standards from International Labor Organization set out in the SUPPLEMENTARY TABLE B below.</p> <p>33. The contractor will provide :</p> <ul style="list-style-type: none"> <li>c) A map showing camp lay out, welfare facilities, and first aid kit locations.</li> <li>d) Plan of how camp areas will be restored to original condition after construction completed</li> </ul> <p>If a construction camp is not required</p> <p>34. The contractor will:</p> <ul style="list-style-type: none"> <li>e) Provide adequate waste disposal facilities including garbage cans for workers.</li> <li>f) Provide welfare facilities including water for washing, drinking and include facilities for male and female workers</li> <li>g) Provide toilets for male and female construction workers with a cleaning schedule</li> </ul> <p>35. The contractor will ensure training is delivered to construction workers on the following and the contractor will provide a training schedule:</p> <ul style="list-style-type: none"> <li>h) HIV Aids education awareness</li> <li>i) Cambodian laws for foreign labor regarding: hunting, fishing and traffic rules</li> <li>j) Grievance Redress Mechanism – how to deal with affected people who make a complaint to a worker</li> <li>k) Occupational Health and Safety and Emergency Procedures.</li> <li>l) COVID-19 prevention measures</li> </ul>	Included in bid price	Contractor	PIU/ PMU
Community Health, Safety	Accident prevention for community	<p>36. Community <b>H&amp;S measures</b> to be included in the management sub-plan will include:</p> <ul style="list-style-type: none"> <li>a) Details of appropriate fencing or protective barriers, lighting and buffer zones which will be provided around all construction sites including barriers with lighting where needed on access roads and populated locations.</li> <li>b) Sufficient signage and information disclosure, and site supervisors and should be placed at all sites.</li> <li>c) Details of signage and speed controls if public roads are to be affected by construction traffic including new access road.</li> <li>d) Details of sufficient signage giving community dangers / warnings and</li> </ul>	Included in bid price	Contractor	PIU/ PMU

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Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Estimated Cost <sup>4</sup> (\$)	Responsibility	
				Implementation	Supervision
		<p>information disclosure outside the landfill construction site and all preparation / staging areas or compounds including new access road</p> <p>e) Speed limits suitable for the size and type of construction vehicles, should be developed, posted, and enforced on all roads including new access road used by construction vehicles</p> <p>f) Access will be safely maintained for the houses and agricultural surrounding the landfill construction site.</p>			
Transport, Storage and Use of Construction Materials	Air pollution, Community Health & Safety, Traffic	<p>37. Define and schedule how materials are extracted from quarry, transported, and handled and stored at sites.</p> <p>38. Define and schedule how fabricated materials such as steel, wood structures will be transported and handled.</p> <p>39. Trucks carrying dry construction materials such as earth; aggregate will be covered with tarpaulins or other suitable cover.</p> <p>40. Driving on unmade roads, trucks will be limited to 15 kph. Warning sign to inform road users of turning heavy vehicles will be used where trucks cross or turn off the National Road #3.</p> <p>41. Asphalt and concrete batching facilities will be located at least 500m downwind from the nearest dwellings in order to reduce the impact of fumes on humans and to be fitted with necessary equipment such as bag house filters to reduce fugitive dust emissions.</p> <p>42. Water will be sprayed on material storage areas where fugitive dust is generated and where vehicles are transporting materials on unmade roads, generating dust, where human receptors are within 300m.</p>	Include in bid price	Contractor	PISCB/ PIU
Use of Machinery & Equipment	Noise, Water Quality	<p>43. Maintain all exhaust systems in good working order; undertake regular equipment maintenance;</p> <p>44. Restrict construction activities using heavy machinery between 8 am-5 pm. If construction is unavoidable at night, noise should not exceed 65dB(A) and vibration 60dB(A) after 6pm.</p> <p>45. Provide advance warning to the noise sensitive receptor (housing) receptors listed in this EMP of key construction programme.</p> <p>46. Public notification of construction operations will incorporate noise considerations; information procedure of handling complaints through the Grievance Redress Mechanism will be disseminated.</p> <p>47. Construction vehicles and machinery will be maintained to a high standard to minimize emissions</p> <p>48. All construction workers will use appropriate Personal Protective Equipment (PPE) including ear defenders when operating machinery;</p> <p>49. No washing or repair of machinery within 50m of surface waters including agricultural ponds.</p> <p>50. Vehicles and machinery to be turned off when not in use.</p> <p>51. Construct temporary noise barriers around excessively noisy activity areas where possible when close to noise sensitive receptors (housing) where WHO and national noise standards would be breached.</p>	Included in Bid Price	Contractor	PIU/ PMU
Storage and Use of	Water quality	52. Refueling only in designated areas which are to be 50 m from a water	Included in	Contractor	PIU/ PMU

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Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Estimated Cost <sup>4</sup> (\$)	Responsibility	
				Implementation	Supervision
chemicals and fuels	Soil quality	course and drip trays to be used when refueling or topping up / changing machinery fluids 53. Construction fluids such as oils, and fuels should be stored and handled on a bunded impermeable surface; a bund will be provided around any above ground fuel storage tanks with a capacity of 110% of the largest single tank. 54. All chemicals and fuels will be in labeled containers.	Bid Price		
Tree Screen	Ecosystem services Operational noise/dust	55. Planting tree screen as required in Construction Contract and Bill of Quantities. This should be a minimum of 440 specimens of local / native species.	Included in Bid Price	Contractor	PIU/ PMU
Compensation planting	Ecosystem services	56. Access road compensation planting along road corridor within road right of way 57. 300 saplings a minimum height of 1m, of native species. 58. PMU to approve tree species and specimen quality with Contractor before purchase – following advice from Provincial Department of Forestry on an appropriate species mix considering biodiversity and climate resilience	\$7,500 for saplings and labour	Contractor	PIU/PMU /Prov. Forestry staff
Restoration and Repair	Damage to public or private assets and landscape	59. The contractor will repair any accidental damage caused as per Construction contract. This must include: 60. Camp / staging areas restoration to original condition after construction completed 61. Retention of topsoil on landfill construction areas to support vegetation screening; clear up of debris 62. Waste, spoil and removal of any contaminated land e.g. oils spills; repair road damage and other accidental damage to the quality specified in the bill of quantities	Included in Bid Price	Contractor	PIU/PMU
Road Safety	Speed Awareness	63. Installation of 2 speed control signs in each direction (total 4) along the new section of road 64. Location of signs to be advised by PMU	\$1000	Contractor	PMU
<b>POST-CONSTRUCTION</b>					
Landfill liner	Groundwater protection	1. The operator will ensure that site is operated so as to protect the liner throughout lifespan of the landfill including prevention of exposure to sun, damage by machinery. 2. Provision of adequate budget for O&M to ensure regular groundwater monitoring	O&M cost	Operator	MPWT / MoE
Landfill Operation	Groundwater protection, surface water protection	3. The operator will develop a Working Plan for the landfill site which will detail procedures for the following – as a minimum: a) Waste transport b) Acceptable waste types c) Hazardous waste management d) Recording waste data e) Site infrastructure (O&M)	O&M cost	Operator	MPWT / MoE

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Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Estimated Cost <sup>4</sup> (\$)	Responsibility	
				Implementation	Supervision
		f) Waste placement g) Using daily cover h) Water balance i) Leachate management j) Maintenance of slopes, compaction and cover to avoid leachate run-off k) Occupational and community health and safety l) Emergency and Incident Management m) Vehicle maintenance n) Odor management o) Maintenance of landscaping (tree aftercare)  4. Environmental Protection and Monitoring. The operator will detail procedures for monitoring: a) Groundwater wells b) Surface water c) Leachate management d) Gaseous emissions via flaring (following cell closure) e) Odor monitoring – boundary and receptor sites f) Grievance redress mechanism			
Landfill Operation	Community Nuisance	5. The operator will install a sign board with relevant contact details and operating hours at the entrance to the landfill site. It will state contact details for raising complaints. 6. The contractor will record all public complaints and deal with them within a timeframe agreed with MPWT and their resolution will be recorded.. 7. The contractor will cover all waste loads and all drivers will follow legal speed limits at all times. 8. Compaction of waste within the day it is deposited at the site and cover the waste weekly 9. Weekly litter collections and removal of any wastes which are not deposited in cells, including waste at the boundary and access roads to the site 10. Washing wheels of vehicles before they leave site if they are muddy from accessing the landfill cells to prevent dust increasing to nearby houses 11. Maintenance of the tree screen at the site boundary to reduce noise, dust and odors	O&M cost	Operator	MPWT / MoE
Landfill Operation	Occupational Health and Safety	12. The operator will detail how the health and safety of the staff at the site will be protected. This will include: p) Measures taken during handling of waste including sorting any waste to segregate recyclables q) Personal protective equipment provision and enforcement of its use r) Health testing (frequency and parameters e.g. for Hepatitis B and tetanus) s) Emergency and Incident Management including prompt medical attention for cuts to prevent contact with the incoming loads or	O&M cost	Operator	MPWT / MoE

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Estimated Cost <sup>4</sup> (\$)	Responsibility	
				Implementation	Supervision
		feedstock t) Good housekeeping measures e.g. Clean and wash with disinfectant the welfare facilities weekly and building and equipment every 4 weeks u) Training plans (frequency and duration of training) in safe operations for all aspects of the operation including landfill gas and leachate management and use of heavy equipment.			
Landfill Operation	Community Health and Safety	13. The operator will detail how the health and safety of the public will be protected. This will include: 14. Measures taken to prevent unauthorized access to the site 15. Measures taken to prevent scavenging/picking by members of the public 16. Staff training on how to manage unauthorised access e.g. by waste pickers	O&M cost	Operator	MPWT / MoE
Landfill Operation	Community Health and Safety	17. Quarterly meetings with residents and / or their representatives to identify odor, pest dust, litter or other nuisance issues.	O&M cost	Operator	MPWT / MoE

20. **COVID-19.** WHO<sup>5</sup> defines ‘*quarantine*’ as the separation of a person who is not ill but who may have been exposed to an infectious person, with the objective of monitoring their symptoms and ensuring the early detection of cases. ‘*Isolation*’ is the separation of a person who is showing symptoms or has confirmed COVID-19 to prevent the spread of infection or contamination. **Contractors must ensure the safe quarantine or isolation of workers and that this does not impact on their employment status.**

EMP SUPPLEMENTARY TABLE A: Construction site working conditions Mitigation measures for COVID-19	
1. Form a joint team to plan and organize return to work	<ul style="list-style-type: none"> <li>Develop or convene a joint occupational safety and health committee with members representing the employer and workers.</li> <li>Train team members on the basic principles for the formulation and implementation of occupational safety and health preventive and control measures.</li> <li>Develop and communicate a work plan on safe working for COVID-19.</li> </ul>
2. Risk assessment to decide when to work, who works and how	<ul style="list-style-type: none"> <li>Undertake a risk assessment to determine the preventive and control measures.</li> <li>Ensure preventative measures are in place before resuming or beginning construction work.</li> </ul>
3. Adopt engineering, organizational and administrative	<ul style="list-style-type: none"> <li>Avoid physical interaction and remain socially distant.</li> <li>Ventilate enclosed workplaces including work camps and communal spaces.</li> </ul>

<sup>5</sup>WHO (19 March 2020) Considerations for quarantine of individuals in the context of containment for coronavirus disease (COVID-19) [https://apps.who.int/iris/bitstream/handle/10665/331497/WHO-2019-nCoV-IHR\\_Quarantine-2020.2-eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/331497/WHO-2019-nCoV-IHR_Quarantine-2020.2-eng.pdf)

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measures	<ul style="list-style-type: none"> <li>• Avoid concentration of workers - limit the capacity of common areas such as work camp dining rooms and changing rooms to allow the minimum separation of 2 meters and organize one-way systems. This includes sleeping areas which must be a minimum of 2 meters between beds.</li> <li>• Put in place training and information on COVID-19 and measures required for its management.</li> <li>• The construction site is to be segregated to the extent possible in zones or other methods to keep different crews physically separated at all time.</li> <li>• Stagger break and lunch schedules to minimize the number of people in close proximity to one another.</li> </ul>
4. Regularly clean and disinfect	<ul style="list-style-type: none"> <li>• Increase the frequency of cleaning and disinfection, in particular heavily trafficked areas and common areas, including work camps.</li> <li>• All door handles, railings, ladders, switches, controls, eating surfaces, shared tools and equipment, taps, toilets, and personal areas are wiped down at least twice a day with a disinfectant.</li> <li>• Discourage the sharing of items such as cups, glasses, plates, tools.</li> </ul>
5. Promote personal hygiene	<ul style="list-style-type: none"> <li>• Provide workers with the conditions and means necessary for frequent hand washing (soap, water or alcohol gel) with a posted hand washing protocol at site entries, exits, bathrooms, communal areas, offices, and any other areas with commonly touched surfaces.</li> <li>• Inform workers of the need to avoid physical contact when greeting, and avoid touching eyes, nose and mouth.</li> <li>• Inform workers of the need to cover the mouth and nose with a disposable handkerchief when coughing or sneezing or the crook of their arm.</li> <li>• Dispose of tissues in a lined and covered waste bin and wash hands afterwards.</li> </ul>
6. Provide personal protective equipment (PPE) and inform workers of its correct use	<ul style="list-style-type: none"> <li>• Identify appropriate PPE related to the tasks and health and safety risks faced by workers according to the results of risk assessment and the level of risk, and provide it to workers free of charge and in sufficient number, along with instructions, procedures, training and supervision.</li> <li>• Non-medical face-coverings (such as homemade cloth masks) should be worn as mitigation for catching and transmitting the virus, but are not to be treated as substitutes for proper handwashing.</li> </ul>
7. Health surveillance and insurance	<ul style="list-style-type: none"> <li>• Before entering the site, staff and visitors must confirm that they are not currently exhibiting flu-like symptoms.</li> <li>• Monitor the health status of workers, develop protocols for cases of suspected and confirmed COVID-19. The protocol will state that :             <ul style="list-style-type: none"> <li>○ workers with <b>symptoms or confirmed cases</b> must be isolated within the construction camp or stay at home for 7 days after symptoms started.</li> <li>○ If symptoms persist after 7 days the person must isolate until the symptoms stop.</li> <li>○ People who have been <b>in close contact</b> with the person with confirmed COVID-19 be quarantined for 14 days.</li> </ul> </li> <li>• All workers in quarantine or isolation must be provided with adequate food, water, medical assistance and sanitation.</li> <li>• Identify workers who have had close contact with people infected with COVID-19 and follow national medical guidance.</li> <li>• Communicate confirmed cases of COVID-19 infection to the appropriate authorities.</li> <li>• All workers should be provided with health insurance that includes COVID-19 treatment</li> </ul>



8. Consider other hazards, including psychosocial	<ul style="list-style-type: none"> <li>• Promote a safe and healthy working environment free from violence and harassment.</li> <li>• Encourage health promotion and wellbeing in the workplace through enough rest, balance of physical and mental activity and adequate work-life balance.</li> <li>• Implement prevention and control measures for the use and storage of chemicals, particularly those used for disinfection during COVID-19.</li> </ul>
9. Review emergency preparedness plans	<ul style="list-style-type: none"> <li>• Develop an emergency plan adapted to COVID-19 and regularly review it.</li> </ul>
10. Review and update preventive and control measures as the situation evolves	<ul style="list-style-type: none"> <li>• Periodically monitor prevention and control measures to determine whether they have been adequate to avoid or minimize risk, and identify and implement corrective actions for continuous improvement.</li> <li>• Establish and maintain records related to work-related injuries, illnesses and incidents, worker exposures, monitoring of the work environment and workers' health.</li> <li>• Construction Workers and Camp Management.</li> </ul>
Source: Adapted from: ILO, <sup>6</sup> WHO, <sup>7 8, 9</sup> Canada Construction Association, <sup>10</sup> and UK Government. <sup>11</sup>	

<b>EMP SUPPLEMENTARY TABLE B Worker Camp Siting and Management Mitigation Measures for Health and Safety and COVID-19</b>	
1. Siting	<ul style="list-style-type: none"> <li>• Not in area liable to flooding, landslide or other natural disaster</li> <li>• Not in area affected by construction dust, noise, sewage or other pollution</li> <li>• Not in a residential area</li> </ul>
2. Minimum housing standards	<ul style="list-style-type: none"> <li>• a separate bed for each worker</li> <li>• beds should not be arranged in tiers of more than two;</li> <li>• separate accommodation of the sexes or to accommodate couples</li> <li>• adequate natural light during the daytime and adequate artificial light</li> <li>• adequate ventilation to ensure sufficient movement of air</li> <li>• adequate supply of safe potable water</li> <li>• adequate sanitary facilities (see below);</li> <li>• adequate drainage</li> </ul>

<sup>6</sup>ILO (May 2020) Practical Guidance: Safe Return to Work. Ten Action Points.

<sup>7</sup> WHO (19 March 2020) Getting your workplace ready for COVID-19

<sup>8</sup> WHO (17 March 2020) Home care for patients with COVID-19 presenting with mild symptoms and management of their contacts

<sup>9</sup> WHO (16 April 2020) considerations in adjusting public health and social measures in the context of COVID-19

<sup>10</sup> Canada Construction Association (April 2020, version 4) COVID-19 Standardised protocols for all Canadian construction sites.

<sup>11</sup> www.gov.uk (19 May 2020) Working safely during coronavirus COVID-19: Construction and other outdoor work

	<ul style="list-style-type: none"> <li>• adequate furniture for each worker to secure his or her belongings, such as a locker.</li> <li>• common dining rooms, canteens or mess rooms, located away from the sleeping areas</li> <li>• appropriately situated and furnished laundry facilities</li> <li>• reasonable access to plug sockets for charging telephones and other devices</li> <li>• rest and recreation rooms and health facilities, where not available in the community.</li> </ul>
3. Minimum accommodation sizes	<p>Sleeping space</p> <ul style="list-style-type: none"> <li>• inside dimensions over 198 centimeters by 80 centimeters;</li> </ul> <p>Sleeping room:</p> <ul style="list-style-type: none"> <li>• headroom of over 203 centimeters allowing full free movement</li> <li>• Beds minimum 2m apart for COVID-19 risk management</li> </ul>
4. Sanitation Facilities	<ul style="list-style-type: none"> <li>• One toilet, one tap / basin, one toilet for every 6 people</li> <li>• Convenient location to accommodation</li> <li>• Provision of soap</li> <li>• Separate facilities for men and women</li> <li>• Ventilation to open air</li> <li>• Fresh cold running water</li> <li>• Clean and hygienic</li> <li>• Septic tank / sewage treatment facility, or pit latrines located at least 200m from surface waters, and in areas of suitable soil profiles, downstream of groundwater wells and above the groundwater levels</li> </ul>
5. Health and Safety within worker accommodation	<ul style="list-style-type: none"> <li>• Separate area for sick workers to prevent transmission of disease</li> <li>• Smoke detector in sleeping area</li> <li>• Fire safety throughout accommodation such as fire extinguishers, fire alarms, fire blankets</li> <li>• Worker training in fire prevention and procedures</li> <li>• Fire exit sign, adequate means of escape and clearly maintained exit</li> <li>• Security lighting within camp and for sanitation block and lighting for route from sleeping area to sanitation block.</li> <li>• Electrical cables to be in safe condition, elevated and not in areas liable to flood</li> </ul>
6. Inspection	<ul style="list-style-type: none"> <li>• 2 weekly inspection to inspect for cleanliness, state of repair of building, accommodation and fire equipment.</li> <li>• Record inspection results and retain for review</li> </ul>
Source: Adapted from ILO Workers' Housing Factsheet No.6. <sup>12</sup>	

<sup>12</sup> ILO (2009) Workers' housing. ILO Helpdesk Factsheet No. 6



## V. MONITORING AND REPORTING PLAN

21. The purpose of the monitoring plan is to determine the effectiveness of the impact mitigations, and to document any unexpected positive or negative environmental impacts of the subproject.

22. During project implementation, monitoring will be reported to the PMU and will form the basis of the required reporting. The monthly reports will provide the majority of the information for the semi- annual reports. Templates are provided by the support consultants to assist the responsible roles for monitoring and reporting.

23. The key monitoring mechanisms and costs are shown in Table 10.

**Table 10: Monitoring Type and Cost**

Monitoring	Purpose	Estimated Cost or Source of Budget
1. <b>Project readiness monitoring</b>	Monitoring to check progress on project readiness and close gaps through corrective actions <b>See Table 11</b>	No additional cost, part of project activities
2. <b>Project phase environmental quality monitoring</b>	To be conducted by a competent authority or person appointed by the Contractor, involving the collection and analyses of air quality, noise and water quality data at designated monitoring locations for assessing compliance with applicable environmental quality and emission standards during construction <b>See Table 12</b>	Pre-Construction \$6,500 During Construction <b>per year</b> \$18,700
3. <b>EMP compliance monitoring</b>	Monthly EMP Issues and Health and Safety monitoring to be provided by the <b>Contractor</b>  Monthly verification of EMP compliance during project implementation through site visits by <b>PIU</b> with support from Construction Supervision Company and PISCB. <b>See Table 13</b>	No additional cost, part of project implementation activities
4. <b>Affected People monitoring</b>	A consultative approach. This is to be conducted by the PIU via consulting affected people on the impacts during construction. <b>See Table 13</b>	No additional cost, part of project implementation activities
5. <b>Operational phase environmental quality monitoring</b>	This is required as part of the operation of the landfill will be undertaken by the PDPWT/operator. <b>See Table 12</b>	Included in operator O&M costs

24. Contractors will bear the costs for all mitigation measures during construction, including those specified in the tender and contract documents as well as those to mitigate unforeseen impacts due to their construction activities.

25. The operator will be responsible for operation and the cost is included in annual budget plan.

### 5.1 Project Readiness Monitoring

26. Before construction, the PISCB Consultant will monitor the project's readiness on environmental management based on a set of indicators and report it to ADB and PMU, see **Table 11**. This assessment will formally demonstrate that environmental commitments are being carried out and environmental management systems are in place before construction starts, or suggest corrective actions to ensure that all requirements are met.

Table 11: Project Readiness Assessment Indicators

Indicator	Criteria	Are the Criteria met? Yes/No	If No, What Corrective action is needed?	Date for Corrective Action Completion
1. EMP update	EMP updated after domestic IESIA approval and detailed design & approved by ADB/MoE	Y/N		
2. Compliance with loan covenants	The borrower complies with loan covenants related to project design and environmental management	Y/N		
3. Public involvement effectiveness	Meaningful consultation completed	Y/N		
	GRM established with entry points	Y/N		
4. Environmental supervision and monitoring in place	Recruitment of MPWT staff as set out in the Institutional Arrangements for this EMP	Y/N		
	Nomination of government staff for PIU roles as set out in the Institutional Arrangements for this EMP	Y/N		
5. Bidding documents and contracts with environmental safeguards	Bidding documents and contracts incorporate the environmental activities and mitigation measures required by this EMP	Y/N		
	Bidding documents and contracts incorporate the Particular Conditions for bidding (see Appendix 3)	Y/N		
6. EMP financial support	The required funds have been set aside for EMP implementation including training and capacity building	Y/N		

## 5.2 Environmental Quality Monitoring

27. During construction, the impact on the sensitive environmental receptors will be monitored and compared against the relevant national standard. During operation, the relevant operator will be expected to maintain an adequate budget to ensure environmental monitoring can be undertaken as specified in Table 12.

**Table 12: Environmental Quality Monitoring**

ENVIRONMENTAL EFFECTS MONITORING							
Environmental Indicators	Location	Means of Monitoring	Frequency	Reporting	Responsibility		Estimated Cost (USD) Per Year
					Implement	Supervision	
<b>PRE-CONSTRUCTION</b>							
A) Ambient air quality (2 samples): CO, NO2, SO2, TSP, O3, Pb, PM 10 and PM 2.5.	AIR QUALITY - - Receptor Properties 1 and 2 (see Receptor Map) – based on dominant wind direction and proximity	Using field and analytical methods approved by MoE.	A & B & C & D Once before construction phase starts	Once baseline report before construction phase starts.	PISCB	PMU	A & B: \$6,500
B) Ambient noise and Vibration	NOISE- - Receptor Properties 1 and 2 (see Receptor Map) – based on dominant wind direction and proximity						C & D: \$750
C) Surface water quality: pH, TDS, TSS, DO, BOD5, COD, Oil and Grease, Detergent, SO4, TN, TP, Pb, AS, Cd, Hg and Total Coliform.	SURFACE WATER nearest agricultural pond:						
D) Mine Clearance and Unexploded ordnance	Included in Bill of Quantities						
<b>Sub-total (Prior to construction for baseline data):</b>							<b>\$ 6,500</b>
<b>CONSTRUCTION</b>							
E) Ambient air quality (2 samples): CO, NO2, SO2, TSP, O3, Pb, PM 10 and PM 2.5.	AIR QUALITY - Receptor Properties 1 and 2 (see Receptor Map) – based on dominant wind direction and proximity	AIR, NOISE, SURFACE WATER Using field and analytical methods approved by DoE.	AIR, NOISE, Every three months during construction	Within 1 week of obtaining monitoring results	Contractor	PMU/PIU/PISCB/ MoE	AIR/NOISE \$7,000
F) Ambient noise and Vibration	NOISE- Receptor Properties 1 and 2 (see Receptor Map) – based on dominant wind direction and proximity		SURFACE WATER Every Six monthss during construction				SURFACE WATER \$3000
G) Surface water quality: pH, TDS, TSS, DO, BOD5, COD, Oil and Grease, Detergent, SO4, TN, TP, Pb, AS, Cd, Hg and Total Coliform.	SURFACE WATER nearest agricultural pond:		GROUNDWATER: Once after construction of wells				GROUND WATER \$3,000

ENVIRONMENTAL EFFECTS MONITORING							
Environmental Indicators	Location	Means of Monitoring	Frequency	Reporting	Responsibility		Estimated Cost (USD) Per Year
					Implement	Supervision	
H) Ground water: pH, TSS, BOD5, COD, Oil and Grease, Detergent, TN, TP, NH <sub>3</sub> and Coliform.	GOUNDWATER Two monitoring wells						
I) Field observation from related Ministry or department e.g. MoE, DoE	Project location	Using field observation	Every 3 month		Contractor	MoE/DoE	\$ 5,700 <sup>13</sup>
<b>Sub-Total (Construction) Per Year:</b>							<b>\$18,700</b>
OPERATION PHASE							
Surface water quality: pH, TDS, TSS, DO, BOD5, COD, Oil and Grease, Detergent, SO <sub>4</sub> , TN, TP, Pb, AS, Cd, Hg and Total Coliform.	Any permanent or temporary surface water ponding / accumulation, down slope of leachate treatment	Using field and analytical methods approved by MoE	After intense rainfall events	Every 3 months	PDPWT/ Operator	MPWT / MoE	Annual budget
Groundwater quality	Two monitoring wells	Using field and analytical methods approved by MoE.	Every 3 months	Every 3 months	PDPWT/ Operator	MPWT / MoE	Annual budget
Odor and dust and pests	5 houses within 300m	Using field observation and Meeting	Every 3 month or when a complaint is made	Annually	PDPWT/ Operator	MPWT / MoE	Annual budget
Landfill Gas – CH <sub>4</sub> lower explosive limit threshold (5%) , O <sub>2</sub> , CO <sub>2</sub>	Older waste mound, nearest two houses, guard house and other areas where migrating gas can accumulate e.g gullies	Using field and analytical methods approved by MoE	Every 6 months after gas third year of operation	Every 3 months	PDPWT/ Operator	MPWT / MoE	Annual budget

### 5.3 EMP Compliance and Affected People Monitoring

28. In order for the EMP to be effective, all its mitigation measures in the EMP must be monitored to ensure they are implemented. Table 13 defines the responsibilities of the PIU in monitoring the monthly progress against the EMP during construction. Note this applies to construction only; during operation, it is the responsibility of the appropriate ministry or its line department to ensure monitoring of operational facilities is incorporated in the operations and maintenance manual and carried out routinely.

<sup>13</sup> Budgets for MoE staffs to monitor on environmental problem during construction stage

29. The contractor will provide a basic monthly monitoring report focusing on Health and Safety and identify any potential issues with future EMP compliance. This will not duplicate the more detailed monitoring and reporting to be undertaken by the PISCB-CSC. Locally based PIU-ESC is responsible for site visits to check on the actual impacts on people of the project and identify any adjustments in the EMP required.

**Table 13: EMP Compliance and Affected People Monitoring**

Environmental Indicators	Location	Method & Frequency	Responsibility		Estimated Costs (USD)
			Implement	Verify	
<b>Construction Phase</b>					
Air Quality & Noise & dust	<b>Locations</b> <ul style="list-style-type: none"> <li>• Earthworks and General Civil Works sites</li> <li>• Use of Machinery &amp; Equipment</li> <li>• Transport, Storage and Use of Construction Materials</li> </ul>	Monthly checking against mitigation measures specified in this EMP	Contractor	PIU-ESC with PISCB/CSC support	Included in Project Costs
Solid and Liquid Waste Management	Landfill site and all related construction areas	Monthly checking against mitigation measures specified in this EMP			
Tree Screen	Landfill site	When planted, check viability of trees and quality			
Water Quality	<ul style="list-style-type: none"> <li>• Landfill site (agricultural water ponds)</li> </ul>	Monthly checking against mitigation measures specified in this EMP			
Occupational Health and Safety: Prevention and Emergency Response	<ul style="list-style-type: none"> <li>• Landfill site and all related construction areas</li> </ul>	Monthly checking against mitigation measures specified in this EMP			
Construction Workers and Camp Management: Contamination of water, soil, waste production and social issues	<ul style="list-style-type: none"> <li>• Workers Camp</li> </ul>	Monthly checking against mitigation measures specified in this EMP			
Community Health & Safety	Landfill site and access roads	Monthly checking against mitigation measures specified in this EMP			
Pollution from chemicals and fuels	<ul style="list-style-type: none"> <li>• Storage area for chemicals and fuels</li> <li>• Use of Machinery &amp; Equipment</li> </ul>	Monthly checking against mitigation measures specified in this EMP			



Environmental Indicators	Location	Method & Frequency	Responsibility		Estimated Costs (USD)
			Implement	Verify	
<p>Community Issues - At all construction locations</p> <ul style="list-style-type: none"> <li>• Environmental impacts of civil works (e.g., solid &amp; liquid waste, erosion, local flooding, pollution).</li> <li>• Any unforeseen impacts caused by accidentally e.g. through spillages</li> <li>• Civil nuisance (e.g., noise, disrupted business &amp; farming activity, social issues, community health and safety).</li> <li>• Impaired use of access roads (e.g. traffic issues and access).</li> <li>• GRM and its procedures &amp; key contacts</li> </ul>		<p>Consultation interview with Affected People Using the form in Appendix 1 and Site Observations.</p> <p>4-6 weeks after construction starts Monthly until end of construction</p>	PIU-ESC	PMU/PISCB	Included in Project Costs

### 5.4 Environmental Policy and Standards

30. The construction and operation phases of the projects shall follow relevant environmental quality standards. These are presented in Appendix 4 for reference. These quality standards relate to i) air quality, ii) ambient surface water quality, iii) groundwater quality, vi) soil quality, v) effluent quality.

## 5.5 Reporting

31. Environmental monitoring reports will be prepared semi-annually for the EA by the Project Management and Implementation Support consultants in collaboration with PMU's Environmental Safeguard Officer and sent to MPWT's Environmental Safeguard Office, MoE and ADB. The reports will table all indicators measured with the monitoring plan of EMP including performance monitoring indicators, and will include relevant national environmental quality standards. Table 14 gives reporting requirements during the project implementation.

**Table 14. Monitoring and Reporting Requirements**

<b>No.</b>	<b>Report</b>	<b>Frequency</b>	<b>Purpose</b>	<b>From</b>	<b>To</b>
1	Site Visit Report: EMP Verification	Monthly	Verify EMP implementation Confirm EMP and GRM are working (consultation and observation)	PIU-ESC with support from PISCB / CSC	PMU-ESO/PISCB
2	Contractors' Environment Health and Safety Progress Report	Monthly	EMP Implementation Progress and H&S Progress	Contractor	PMU
3	Environmental Quality Monitoring	Varies - as per monitoring table in EMP	Relevant environmental parameters	Contractor (or laboratory)	PMU (PMU-ESO to send to EA)
4	Environmental Monitoring Report (Integrated safeguards monitoring report format)	Semi-Annual	Full EMP Implementation and Adherence to Environmental Covenants/Conditions	PMU / PISCB	MoE/ADB

## **VI. PUBLIC CONSULTATION AND PARTICIPATION**

32. The Consolidated IEE for this sub-project contains details of the consultation undertaken during preparation of these sub-projects.

33. Further consultation will take place during implementation. The PIU and PMU will collaborate to undertake consultation interviews within 4-6 weeks of construction starting and then again, minimum every 3 months until the end of construction. This is set out in the Environmental Monitoring Plan provided in the Environmental Management Plan for each sub-project.

34. Informal monitoring interviews with affected people will focus on complaints about community disturbance from construction activities, such as construction noise, dust, solid waste and wastewater, as well as public concerns about ecological protection, soil / land concerns and access issues. A sample Environmental Monitoring Interview Form is given in Appendix 1. This will contribute to project monitoring

## VII. GRIEVANCE REDRESS MECHANISM

### 7.1 Objective

35. A grievance redress mechanism (GRM), consistent with the requirements of the ADB Safeguard Policy Statement (2009) will be established to prevent and address community concerns, reduce risks, and assist the project to maximize environmental and social benefits. In addition to serving as a platform to resolve grievances, the GRM has been designed to help achieve the following objectives: (i) open channels for effective communication, including the identification of new environmental issues of concern arising from the project; (ii) demonstrate concerns about community members and their environmental well-being; and (iii) prevent and mitigate any adverse environmental impacts on communities caused by project implementation and operations. The GRM is accessible to all members of the community and is free of charge. The project GRM aims to manage grievances within the project structure initially, through PIU/PMU and contractors. If a resolution is not achieved local affected people can contact the most accessible Grievance Redress Committee member for them, such as village chief of sangkat representative.

36. The GRM is set out here in accordance with the approved approach established during Project Preparation, which remains valid and is used for the other subprojects in Kampot. This is a separate grievance system to that managed by General Department of Resettlement which deals with resettlement issues only.

### 7.2 Proposed Approach

37. The following roles and responsibilities for the GRM is set out in **Table 15**.

**Table 15: GRM Roles and Responsibilities**

Role	Responsibilities in GRM
MPWT / Executing Agency	<ul style="list-style-type: none"> <li>Establish the GRM</li> <li>Set up a Grievance Redress Committee (GRC)</li> </ul>
Grievance Redress Committee (GRC)	<p><b>Members:</b></p> <ul style="list-style-type: none"> <li>Sangkat representative</li> <li>Village leaders or representative</li> <li>PIU-ESC</li> <li>PMU-ESO</li> <li>Municipality representatives</li> <li>Provincial representatives</li> </ul> <p><b>Function:</b></p> <ul style="list-style-type: none"> <li>GRM Access Point and Decision Making</li> <li>Monitor and record complaints</li> </ul>
PMU-ESO	<ul style="list-style-type: none"> <li>Oversight of GRM implementation and use</li> <li>Co-ordination with PIU-ESC</li> <li>Contact with ADB if Affected People appeal the process</li> <li>GRM reporting</li> <li>Entry point for people during construction</li> </ul>
PIU-ESC	<ul style="list-style-type: none"> <li>GRM Complaint Screening, Record keeping and document storage of all GRM complaints (Formal or Informal)</li> <li>GRM implementation at the town level</li> <li>Responsible for keeping the PMU informed</li> <li>Entry point for people during construction</li> </ul>
Contractor	<ul style="list-style-type: none"> <li>Entry point for people during construction</li> </ul>

Local Government Institutions and representatives (village chief, sangkat, municipality)	<ul style="list-style-type: none"> <li>• Entry point for people during construction</li> </ul>
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38. **Table 16** shows sangkats/communes and villages within the project area. Representatives such as Village Chief will be included in the GRM committee and will be key access points for GRM implementation:

**Table 16: Sangkats and Villages for GRM Access and Implementation**

Sub-Project Component	District/ town	Commune / Sangkat	Village
Landfill Site	Tuek Chhou	Thmei	Kor Chen Leng

### 7.3 Access to the Mechanism and Communication

39. The PMU-ESO and PIU-ESC, will ensure that:

- The public, especially the residents and business owners, in the main areas of influence of the subprojects, are aware of their rights to access, and will have access to, the GRM free of administrative and legal charges;
- The GRM is fully disclosed prior to construction: (a) in public consultations or social/community events, (b) through posters displayed in the offices of the PMU, PIU, Kampot Municipality and concerned Villages/Sangkats and at strategic places within the main areas of influence of subprojects (posters to include names and contact details of the PMU-ESO and PIU-ESC); and (c) sign boards at construction sites.
- Access points will participate in GRM issues and will include:
  - Village representative, e.g. Village Chief
  - Sangkat representative e.g. from Sangkat Committee
  - Municipal government representative
  - PIU-ESC and PMU-ESO

40. The GRM will be communicated to the public and affected people as a Project Hotline; this is considered to be more resonant with people than a ‘grievance redress mechanism’. This will include a project hotline notice board to be located in each active construction related area which must include the landfill site, construction camps and staging areas.

41. The project hotline notice board will include the following information and will require a designated telephone number which is for the project and not personal to individual members of staff

### Project Hotline

**Project:** Construction of [drainage and sewage network / Wastewater Treatment Plant / or landfill] in [town]

**For suggestions, questions or problems related to the project, please contact any of these phone numbers: Call, SMS or Telegram**

Name	Role or Company	Phone Number
	Project Management Office, Ministry of Public Works and Transport, Phnom Penh,	
	Project Implementation Office, Phnom Penh, Department of Public Works and Transport, [Town]	
	Sangkat [town]	
	Village Chief, [village]	
	Construction Contractor, [company name]	
	Construction Site Supervisor, Project Management and Implementation Consultants	

You can also contact ADB directly:

ADB, Phnom Penh Office:  
[Name] and [Phone Number] and [email address]

ADB Southeast Asia Department of ADB, Manila, Philippines:  
[Name] and [Phone Number] and [email address]

#### 7.4 GRM Steps and Timeframe

42. Informal **Approach**. Informally, an affected person (AP) can lodge complaint directly to the Contractor during construction or Operator during operation.

43. The contractor will initially ensure its worker /staff member hands a GRM Contact Card (required by this EMP) to the complainant. The contractor will also immediately inform the PIU of the complaint and PIU will register it under the GRM. If possible, the contractor will rectify the problem within one day of the complaint.

44. The PIU will screen the complaint within one day of receipt. If screening reveals the complaint as Project-related and valid, the Contractor will act within three days from confirmation that the complaint is valid, by PIU, if the problem was not rectified immediately.

45. For at least a week after confirmation of completion, the PIU will monitor the effectiveness of the action/resolution taken. After which, PIU will secure a written confirmation of satisfaction from the AP.

46. **Formal Approach.** If informally lodged complaint is valid but is not acted on within four days from receipt of complaint, or if AP is not satisfied with the resolution undertaken by the Contractor/Operator, AP can access the formal mechanism, which comprises of four stages.

**First Stage.** For valid environmental complaints, the steps and timeframe involved in addressing complaint at the first stage are presented below.

<b>Step 1</b>	<b>AP Complaint (Day 1)</b>
	<ul style="list-style-type: none"> <li>Complaint is filed by Access Point at Kampot town level, verbally or in writing, with an access point.</li> <li>Complaint is passed to PIU-ESC</li> </ul>
<b>Step 2</b>	<b>Screening (Day 2)</b>
	<ul style="list-style-type: none"> <li>PIU-ESC screens complaint</li> <li>AP is immediately informed of the screening results</li> <li>An AP with complaint screened as non-Project-related and/or invalid will be advised that he/she can raise his/her complaint to the second stage; and receiving agent will formally forward the complaint to the Kampot District Office</li> </ul>
<b>Step 3</b>	<b>Investigation, Discussion and Agreement (Day3-4)</b>
	<ul style="list-style-type: none"> <li>PIU, Contractor and AP will discuss the complaint at the site within 2 days of screening.</li> <li>Agreement on actions and measures and time involved will be made with the AP.</li> <li>Agreement will be documented and filed by PIU-ESC;;PMU, AP, Contractor/Operator will have copies. PMU to be consulted if PIU require.</li> </ul>
<b>Step 4</b>	<b>Implementing the Agreed-on Resolution (Day 5-10)</b>
	<ul style="list-style-type: none"> <li>If required action is minor, i.e., not requiring further investigation and would be quick and easy to implement, the Contractor/Operator will immediately implement the agreed action. (starting Day5)</li> <li>If required action is major, i.e., requiring further investigation and/or procurement of supplies/parts, the Contractor/Operator will: (i) immediately provide the most suitable interim measure to reduce the magnitude of the impact (starting Day 5); and (ii) start work on the major action within 5 days from discussion (or not later than Day 10 since receipt of complaint).</li> <li>AP will be advised by the PIU that his/her complaint may be raised to the second level of the GRM, if he/she so prefers when: (i) minor action is not implemented on time; (ii) interim measure is not implemented on time; or (iii) major action is not implemented on time.</li> </ul>
<b>Step 5</b>	<b>Confirmation of Completed Action</b>
	<ul style="list-style-type: none"> <li>Contractor/Operator will secure a written confirmation of completed action from the AP and furnish the PIU a copy.</li> </ul>
<b>Step 6</b>	<b>Confirmation of Satisfaction (1 week after confirmation of completed action)</b>
	<ul style="list-style-type: none"> <li>The PIU will monitor the effectiveness of the resolution for at least a week after receipt of confirmation of completed action from the Contractor/Operator. After which, PIU will secure a written confirmation of satisfaction from the AP.</li> </ul>

**Second Stage.** For actions not taken within the agreed timeframe and when AP is dissatisfied with the action taken at the First Stage, AP can raise his/her complaint to the District Office GRC Representative. The District Office has 15 days within which to resolve the complaint to the satisfaction of all concerned. If the complaint cannot be solved at this stage, the District Office will bring the case to the Provincial Grievance Redress Committee representative.

**Third Stage – Provincial Level Appeal.** If the AP remains dissatisfied (or, in the event the issue/impact persists despite actions undertaken), AP can appeal for assistance from the district in the elevation of his/her complaint to the provincial authority. The provincial authority shall call all parties concerned to review the history of the grievance and resolution process taken and assess the validity of the appeal.

Within 30 days of the submission of the grievance, the Provincial GRC representative must make a written decision and submit copies to the MPWT, GRC members and the AP.

If appeal is found not valid, the provincial authority shall write the AP and declare the grievance closed. In the event of an appeal, the MPWT shall immediately report to the PMU. The PMU shall ensure that the ADB is immediately informed.

**Fourth Stage – ADB Special Mission or Judicial System.** If the complainant is still unsatisfied, the PMU/EA will inform ADB to convene a special mission to attempt a resolution prior to use of the Cambodian judicial system

**Accountability Mechanism of the ADB.** In addition, affected people may always contact the Complaints Receiving Officer of the ADB:

Complaints Receiving Officer, Accountability Mechanism  
Asian Development Bank  
ADB Headquarters, 6 ADB Avenue, Mandaluyong City 1550, Metro Manila,  
Philippines  
(+632) 632-4444 loc. 70309  
(+632) 636 2086  
amcro@adb.org

Instructions available here: <http://www.adb.org/site/accountability-mechanism/how-file-complaint>.

47. The Project's GRM should not impede access to the country's jurisdiction or administrative remedies. Accessing the country's legal system and GRM can be done at the same time. If efforts to resolve disputes using the grievance procedures remain unresolved or unsatisfactory, AP has the right to directly discuss his/her concern/complaint with the ADB's Urban Development and Water Division, Southeast Asia Department through the ADB Cambodia Resident Mission.

48. The PMU, PIU and GRC will keep records of all lodged and documented/referenced complaints, actions/resolutions taken, AP's written confirmations of completed action and satisfaction, complaints raised to higher levels, lessons learned. The number of grievances recorded and resolved and the outcomes will be displayed at the offices of PIU, PMU and Municipality and reported in the monthly progress reports, semi-annual monitoring reports during construction and annual monitoring reports during operation, submitted to ADB.

49. The PMU will do periodic review of the effectiveness of the GRM in each town and record information on the effectiveness of the mechanism, especially on the project's ability to prevent



and address complaints. All costs involved in resolving complaints (meetings, consultations, communication and reporting/information dissemination) will be borne by the PMU. In cases where AP does not have the writing skills or are unable to express their grievances verbally, he/she may seek third-party assistance of his/her choice.

## **IX. CONCLUSION**

50. The EMP, if implemented as directed, will mitigate impacts on the natural environment and affected people to an acceptable level. The key parties for mitigation measure implementation are the construction contractors and the operator. The implementation of this EMP will be closely monitored and reported on by the relevant stakeholders in the project.

51. The most significant impacts from the project will arise from landfill operation. The site selection is appropriate as it is far from the majority of environmental and social receptors however all landfills regardless of operational measures, generate dust, odour and a risk to groundwater. These risks are elevated where operators have little experience of operation of a control and lined landfill. As a result, there is a comprehensive training and capacity building component to the project which is essential for ensuring the investment is financially and environmentally sustainable and beneficial which will mean effective landfill operation. In addition city wide improvements in waste collection are required in order to ensure the benefit of the landfill is fully realized; waste collection improvements are not within the scope of this subproject.

52. A robust Grievance Redress Mechanism will be established. It will ensure that all unplanned impacts which cause grievances for affected people are managed swiftly and a satisfactory outcome brought about.

53. Overall, the project is anticipated to bring environmental benefits to the city and its residents. It will serve to improve the current waste management situation and will provide long term environmental improvements.

## Appendix 1 Affected Person Monitoring Form

### Consultation / Interview Form

<b>Date of Interview</b>		<b>Interviewer Name</b>	
<b>Interview Site:</b> <i>Where is the interview held? In school, on the road, in shop</i>		<b>Stakeholder Name &amp; Status:</b> <i>Full name, status is business owner, school teacher, religious leader, resident</i>	
<b>Construction Site &amp; Date Construction Started</b> <i>Which road, GPS location if available</i>		<b>Has this stakeholder been interviewed before?</b> <i>Yes (when were they interviewed) No</i>	

### Interview Discussion Points:

<b>1. NOISE</b>	<b>Record of Discussion</b>
<b>Before the project started, was the person disturbed by noise? If yes, explain how and when.</b> <i>Where did the noise come from? E.g. traffic, machinery, people, music When did it disturb the person? E.g. all day, at night, intermittently</i>	
<b>During the construction, is the person disturbed by noise from the project? If yes, explain how and when.</b> <i>What type of noise and where did the noise come from? All day, at night, intermittently?</i>	
<b>If noise from construction is a problem, what changes does the person suggest are made?</b>	
<b>2. AIR QUALITY</b>	<b>Record of Discussion</b>
<b>Before the project started, was the person affected by air pollution or dust? If yes, explain how and when.</b> <i>Where did the pollution or dust come from? E.g. traffic, machinery, construction, burning garbage, cooking stoves When was the dust or pollution a problem? E.g. all day, at night, intermittently</i>	
<b>During the project, is the person disturbed by dust or pollution? If yes, explain how and when.</b> <i>What type of noise and where did the noise come from? E.g. increased traffic congestion, construction machinery, construction workers, burning construction garbage etc When did it disturb the person? E.g. all day, at night, intermittently</i>	
<b>If dust or air pollution from the construction is a problem, what changes does the person suggest are made?</b>	

<b>3. VEGETATION AND LAND USE</b>	<b>Record of Discussion</b>
<p><b>Before the project started, what was the vegetation like in the project area?</b>  <i>E.g. pasture land, trees, shrubs, rice fields.</i></p>	
<p><b>During the project, has the person found the vegetation situation has changed? If yes, explain how and when.</b></p>	
<p><b>If impact on vegetation is unacceptable, what changes does the person suggest are made?</b></p>	
<b>4 COMMUNITY SAFETY</b>	<b>Record of Discussion</b>
<p><b>Before the project started, can you describe the community safety situation in the project area?</b>  <i>E.g. no problems, some accidents, difficulty crossing the roads</i></p>	
<p><b>During the project, has the person found the community safety situation has changed? If yes, explain how and when.</b>  <i>Slower traffic so easier to cross the roads, construction vehicles are making a crossing harder / easier, more accidents / less accidents, construction site dangers</i></p>	
<p><b>If change in road safety is unacceptable, what changes does the person suggest are made?</b></p>	
<b>5. WATER QUALITY</b>	<b>Record of Discussion</b>
<p><b>Before the project started, was the person affected by poor water quality? If yes, explain how and when.</b>  <i>Ground water ? Surface Water ? which Water source ? How was it polluted ?</i></p>	
<p><b>During the project, is the person affected by water pollution? If yes, explain how and when.</b>  <i>Ground water ? Surface Water ? which Water source ? How is quality being affected ?</i></p>	
<p><b>If water quality from the construction is a problem, what changes does the person suggest are made?</b></p>	
<b>6. ACCESS</b>	<b>Record of Discussion</b>
<p><b>During the project, is the person affected by reduced access to their business, home or land ?</b>  <b>Access to what is limited, and how ?</b></p>	
<p><b>If access limitations are not acceptable, please suggest changes which can be made ?</b></p>	
<b>7. OTHER ISSUES</b>	<b>Record of Discussion</b>
<p><b>Any other issues about the construction sites that the person wants to discuss?</b>  <i>E.g. wastewater concerns, waste disposal, Other concerns, labor force,</i></p>	

**Appendix 2 GRM – Complaint Recording Form**

<b>PIU Staff Responsible: (name and role)</b>	
<b>Date: (of this record)</b>	
<b>Date of Complaint:</b>	
<b>Date Resolution Required by</b> (5-10 days from initial complaint):	
<b>Complaint Made by:</b> (Name & Contact Details)	
<b>Method of Complaint:</b> (direct to PMU, via Contractor, Via Commune People's Council)	
<b>Details of Complaint:</b> (issues, actions taken so far, when did it start – all details needed)	
<b>PMU Actions:</b> (Next steps for PMU to resolve the issue or to move complaint to next level)	
<b>Follow Up Actions Needed and Date:</b> (PMU to follow up on resolution if needed, e.g. check contractor actions)	

### **Appendix 3 Particular Conditions (for Bidding Documents)**

54. The following clauses shall be added to the Bidding Document, Section 8 Particular Conditions in relation to the Environmental Safeguards for the Project:

55. The contractor will undertake to develop and submit to the PMU for approval, a site specific Construction Environmental Management Plan with requested maps, details and subplans.

56. The management sub-plans will be sufficiently detailed as to allow a clear understanding of the approach the contractor will take to mitigate environmental impacts during construction. The contractor will adhere to the management sub-plans at all times unless prior agreement has been given by the PMU under extenuating circumstances.

57. The Contractor will commit to ensuring a full time environmental health and safety officer on site who is competent, nominated to manage health and safety risks, and who can implement the EMP requirements for occupational health and safety and ensure relevant health and safety legislation is followed.

58. The Contractor will commit to enabling the project staff or consultants tasked with monitoring, full access to all information and data required in order that the Environmental Management Plan can be fully monitored.

## Appendix 4: Environmental Standards For Cambodia

### (1) Ambient Air Quality Standards

Source: Sub-decree **No. 42 ANRK.BK** on Air Pollution Control and Noise Disturbance, MoE 2000.

Parameter	Averaging Period	Standard	
		Unit	Value
Nitrogen Dioxide (NO <sub>2</sub> )	24 hours	mg /m <sup>3</sup>	0.1
Sulfur Dioxide (SO <sub>2</sub> )	24 hours	mg /m <sup>3</sup>	0.3
Carbon Monoxide (CO)	8 hours	mg /m <sup>3</sup>	20
Ozone (O <sub>3</sub> )	1 hours	mg /m <sup>3</sup>	0.2
Lead (Pb)	24 hours	mg /m <sup>3</sup>	0.005
TSP	24 hours	mg /m <sup>3</sup>	0.33
PM 2.5 (use WHO value in Cambodia)	24 hours	mg /m <sup>3</sup>	0.025
PM 10 (use WHO value in Cambodia)	24 hours	mg /m <sup>3</sup>	0.05

### (2) Ambient Noise Standards

Source: Sub-decree **No. 42 ANRK.BK** on Air Pollution Control and Noise Disturbance, MoE , 2000 and WHO. Bold highlights most stringent standard to be followed.

Areas	Time Period (24 hours)	Standard	
		National Standard (dB(A))	WHO Community Noise (dB(A))
RES: Residential Area MIX: Mixed Residential and Small Industries Area I&C: Industrial and Commercial	Day time (from 6:00am to 6:00pm)	RES: 60 MIX: 75	RES: 55 (serious annoyance) <b>RES: 50 (moderate annoyance)</b> <b>I&amp;C: 70 (hearing impairment)</b>
	Evening Time (from 6:00pm to 10:00pm)	<b>RES: 50</b> MIX: 70	RES: 55 (moderate annoyance) <b>I&amp;C: 60 (hearing impairment)</b>
	Night time (from 10:00pm to 6:00am)	<b>RES: 45</b> <b>MIX: 50</b>	RES: 45 (moderate annoyance) I&C: 60 (hearing impairment)

### (3) Surface Water Quality Standard

Referring to Sub-decree **No. 27 ANRK.BK** on Water Pollution Control, MoE, 1999, the standards of water quality are divided as follows:

#### Annex 2 of Sub-decree on Water Pollution Control

**Effluent standard for pollution sources discharging wastewater to public water areas or sewer**

**Protected public water area standard applicable to Kampot landfill.**

No	Parameters	Unit	Allowable limits for pollutant substance discharging to	
			Protected public water area	Public water area and sewer
1	Temperature	0C	< 45	< 45
2	pH		6 – 9	5 - 9
3	BOD5 ( 5 days at 200 C )	mg/l	< 30	< 80
4	COD	mg/l	< 50	< 100
5	Total Suspended Solids	mg/l	< 50	< 80
6	Total Dissolved Solids	mg/l	< 1000	< 2000
7	Grease and Oil	mg/l	< 5.0	< 15
8	Detergents	mg/l	< 5.0	< 15
9	Phenols	mg/l	< 0.1	< 1.2
10	Nitrate (NO <sub>3</sub> )	mg/l	< 10	< 20
11	Chlorine ( free )	mg/l	< 1.0	< 2.0
12	Chloride ( ion )	mg/l	< 500	< 700
13	Sulphate ( as SO <sub>4</sub> )	mg/l	< 300	< 500

## Kampot Landfill: EMP

14	Sulphide ( as Sulphur )	mg/l	< 0.2	< 1.0
15	Phosphate ( PO4 )	mg/l	< 3.0	< 6.0
16	Cyanide ( CN )	mg/l	< 0.2	< 1.5
17	Barium ( Ba )	mg/l	< 4.0	< 7.0
18	Arsenic ( As )	mg/l	< 0.10	< 1.0
19	Tin ( Sn )	mg/l	< 2.0	< 8.0
20	Iron ( Fe )	mg/l	< 1.0	< 20
21	Boron ( B )	mg/l	< 1.0	< 5.0
22	Manganese ( Mn )	mg/l	< 1.0	< 5.0
23	Cadmium ( Cd )	mg/l	< 0.1	< 0.5
24	Chromium ( Cr )+3	mg/l	< 0.2	< 1.0
25	Chromium ( Cr )+6	mg/l	< 0.05	< 0.5
26	Copper ( Cu )	mg/l	< 0.2	< 1.0
27	Lead ( Pb )	mg/l	< 0.1	< 1.0
28	Mercury ( Hg )	mg/l	< 0.002	< 0.05
29	Nickel ( Ni )	mg/l	< 0.2	< 1.0
30	Selenium ( Se )	mg/l	< 0.05	< 0.5
31	Silver ( Ag )	mg/l	< 0.1	< 0.5
32	Zinc ( Zn )	mg/l	< 1.0	< 3.0
33	Molybdenum ( Mo )	mg/l	< 0.1	< 1.0
34	Ammonia ( NH3 )	mg/l	< 5.0	< 7.0
35	DO	mg/l	>2.0	>1.0
36	Polychlorinated Byphemyl	mg/l	<0.003	<0.003
37	Calcium	mg/l	<150	<200
38	Magnesium	mg/l	<150	<200
39	Carbon tetrachloride	mg/l	<3	<3
40	Hexachloro benzene	mg/l	<2	<2
41	DTT	mg/l	<1.3	<1.3
42	Endrin	mg/l	<0.01	<0.01
43	Dieldrin	mg/l	<0.01	<0.01
44	Aldrin	mg/l	<0.01	<0.01
45	Isodrin	mg/l	<0.01	<0.01
46	Perchloro ethylene	mg/l	<2.5	<2.5
47	Hexachloro butadiene	mg/l	<3	<3
48	Chloroform	mg/l	<1	<1
49	1,2 Dichloro ethylene	mg/l	<2.5	<2.5
50	Trichloro ethylene	mg/l	<1	<1
51	Trichloro benzene	mg/l	<2	<2
52	Hexachloro cyclohexene	mg/l	<2	<2

**Remark:** The Ministry of Environment and the Ministry of Agriculture, Forestry and Fishery shall collaborate to set up the standard of pesticides which discharged from pollution sources.

### Annex 4 of Sub-decree on Water Pollution Control

#### (4) Water Quality Standard in public water areas for bio-diversity conservation

Source: Sub-decree No. 42 ANRK.BK on Water Pollution Control, MOE, 1999.

##### a) River

Parameter	Standard	
	Unit	Value
pH	mg/l	6.5 – 8.5
BOD5	mg/l	1 – 10
Suspended Solid	mg/l	25 – 100
Dissolved Oxygen	mg/l	2.0 - 7.5
Coliform	MPN/100ml	< 5000

##### b) Lakes and Reservoirs

Parameter	Standard	
	Unit	Value
pH	mg/l	6.5 – 8.5



## Kampot Landfill: EMP

COD	mg/l	1 – 8
Suspended Solid	mg/l	1 – 15
Dissolved Oxygen	mg/l	2.0 - 7.5
Coliform	MPN/100ml	< 1000
Total Nitrogen	mg/l	1.0 – 0.6
Total Phosphorus	mg/l	0.005 – 0.05

### Annex 5 of Sub-decree on Water Pollution Control:

#### (5) Water Quality Standard (ground and surface water) in public water areas for public health protection (not non-potable water)

No	Parameter	Unit	Standard Value
1	Carbon tetrachloride	µg/l	< 12
2	Hexachloro-benzene	µg/l	< 0.03
3	DDT	µg/l	< 10
4	Endrin	µg/l	< 0.01
5	Dieldrin	µg/l	< 0.01
6	Aldrin	µg/l	< 0.005
7	Isodrin	µg/l	< 0.005
8	Perchloroethylene	µg/l	< 10
9	Hexachlorobutadiene	µg/l	< 0.1
10	Chloroform	µg/l	< 12
11	1,2 Trichloroethylene	µg/l	< 10
12	Trichloroethylene	µg/l	< 10
13	Trichlorobenzene	µg/l	< 0.4
14	Hexachloroethylene	µg/l	< 0.05
15	Benzene	µg/l	< 10
16	Tetrachloroethylene	µg/l	< 10
17	Cadmium	µg/l	< 1
18	Total mercury	µg/l	< 0.5
19	Organic mercury	µg/l	0
20	Lead	µg/l	< 10
21	Chromium, valent 6	µg/l	< 50
22	Arsenic	µg/l	< 10
23	Selenium	µg/l	< 10
24	Polychlorobiohenyl	µg/l	0
25	Cyanide	µg/l	< 0.005

#### (6) Groundwater Quality Standard (for drinking) from Ministry of Handicrafts and Industry Based on WHO (2003) Standards

No	Parameter	Standard	
		Unit	Value
1	pH	-	6.5-8.5
2	Turbidity	NTU	5.0
3	Chloride (Cl-)	mg/l	250
4	Sulphate (SO4)	mg/l	250
5	Aluminum (Al)	mg/l	0.2
6	Copper (Cu)	mg/l	1.0
7	Iron (Fe)	mg/l	0.3
8	Manganese (Mn)	mg/l	0.1
9	Zinc (Zn)	mg/l	3.0
10	Total Coli form	MPN/100ml	0
11	Mercury (Hg)	mg/l	0.001
12	Lead (Pb)	mg/l	0.01
13	Arsenic (As)	mg/l	0.05
14	Nitrate (NO3)	mg/l	50
15	Nitrite (NO2)	mg/l	3

**(7) Effluent Quality Standard**

(Effluent from WWP and from Leachate Treatment Facility at the controlled disposal facility)

**Source:** Sub-decree **No. 42 ANRK.BK** on Water Pollution Control, MOE, 1999.

No	Parameter	Standard (Allowable limits for pollutant substance discharging) to		
		Unit	Value (Protected public water area)	Value (Public water area and sewer)
1	Temperature	OC	< 45	< 45
2	pH		6 – 9	5 - 9
3	BOD5 ( 5 days at 200 C )	mg/l	< 30	< 80
4	COD	mg/l	< 50	< 100
5	Total Suspended Solids	mg/l	< 50	< 80
6	Total Dissolved Solids	mg/l	< 1000	< 2000
7	Grease and Oil	mg/l	< 5.0	< 15
8	Detergents	mg/l	< 5.0	< 15
9	Phenols	mg/l	< 0.1	< 1.2
10	Nitrate (NO3 )	mg/l	< 10	< 20
11	Chlorine ( free )	mg/l	< 1.0	< 2.0
12	Chloride ( ion )	mg/l	< 500	< 700
13	Sulphate ( as SO4 )	mg/l	< 300	< 500
14	Sulphide ( as Sulphur )	mg/l	< 0.2	< 1.0
15	Phosphate ( PO4 )	mg/l	< 3.0	< 6.0
16	Cyanide ( CN )	mg/l	< 0.2	< 1.5
17	Barium ( Ba )	mg/l	< 4.0	< 7.0
18	Arsenic ( As )	mg/l	< 0.10	< 1.0
19	Tin ( Sn )	mg/l	< 2.0	< 8.0
20	Iron ( Fe )	mg/l	< 1.0	< 20
21	Boron ( B )	mg/l	< 1.0	< 5.0
22	Manganese ( Mn )	mg/l	< 1.0	< 5.0
23	Cadmium ( Cd )	mg/l	< 0.1	< 0.5
24	Chromium ( Cr )+3	mg/l	< 0.2	< 1.0
25	Chromium ( Cr )+6	mg/l	< 0.05	< 0.5
26	Copper ( Cu )	mg/l	< 0.2	< 1.0
27	Lead ( Pb )	mg/l	< 0.1	< 1.0
28	Mercury (Hg )	mg/l	< 0.002	< 0.05
29	Nickel ( Ni )	mg/l	< 0.2	< 1.0
30	Selenium ( Se )	mg/l	< 0.05	< 0.5
31	Silver ( Ag )	mg/l	< 0.1	< 0.5
32	Zinc ( Zn )	mg/l	< 1.0	< 3.0
33	Molybdenum ( Mo )	mg/l	< 0.1	< 1.0
34	Ammonia ( NH3 )	mg/l	< 5.0	< 7.0
35	DO	mg/l	>2.0	>1.0
36	Polychlorinated Biphenyl	mg/l	<0.003	<0.003
37	Calcium	mg/l	<150	<200
38	Magnesium	mg/l	<150	<200
39	Carbon tetrachloride	mg/l	<3	<3
40	Hexachloro benzene	mg/l	<2	<2
41	DTT	mg/l	<1.3	<1.3
42	Endrin	mg/l	<0.01	<0.01
43	Dieldrin	mg/l	<0.01	<0.01
44	Aldrin	mg/l	<0.01	<0.01
45	Isodrin	mg/l	<0.01	<0.01
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47	Hexachloro butadiene	mg/l	<3	<3
48	Chloroform	mg/l	<1	<1
49	1,2 Dichloro ethylene	mg/l	<2.5	<2.5
50	Trichloro ethylene	mg/l	<1	<1
51	Trichloro benzene	mg/l	<2	<2
52	Hexachloro cyclohexene	mg/l	<2	<2

