# Resettlement Due Diligence Report

7 August 2017

# Cambodia: Provincial Water Supply and Sanitation Project Proposed Siem Reap Wastewater Subproject

Prepared by the Ministry of Public Works and Transport for the Asian Development Bank (ADB).

#### CURRENCY EQUIVALENTS

(as of	<sup>-</sup> 7 Au	gust 2017)
Currency unit	_	riel (KR)
KR1.00	=	\$0.000244
\$1.00	=	KR4,103

#### ABBREVIATIONS

ADB AH AP	-	Asian Development Bank Affected Household Affected Person
DDR	-	Due Diligence Report
HH	-	Household
O&M	-	operation & management
PIU	-	Project Implementation Unit
PMU	-	Project Management Unit
PPTA	-	Project Preparation Technical Assistance
PWSSP	-	Provincial Water Supply and Sanitation Project
RF	-	Resettlement Framework
RoW	-	Right of Way
RP	-	Resettlement Plan
WWTP	-	Wastewater Treatment Plant

#### WEIGHTS AND MEASURES

ha	-	hectare/s
km	-	kilometres
km <sup>2</sup>	-	square kilometres
Lpcd	-	liters per capita per day
l/s	-	liters per second
m	-	meter
m²	-	square meter
m <sup>3</sup>	-	cubic meter
m³/day	-	cubic meter per day
sqm	-	square meter

#### NOTE

In this report, "\$" refers to US dollars.

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### I. OVERVIEW OF THE PROJECT

#### A. Background of the Provincial Water Supply and Sanitation Project

1. The Provincial Water Supply and Sanitation Project (PWSSP) is to improve and expand urban water supply in selected towns and wastewater and septage management services in the same towns to contribute to the Government's targets for urban water supply and effective urban sanitation. The PWSSP combined outputs include: (i) water supply systems improved and service coverage increased through the development of new water supply intakes and treatment facilities, replacement of old water mains, and expansion of the distribution network; (ii) septage management and sewerage services provided through the provision of septage collection and treatment facilities and the development of expanded sewerage systems and replacement of old underperforming wastewater infrastructure ; and (iii) project implementation and operation and maintenance (O&M) developed to complement ongoing institutional development and capacity building in procurement, financial management, and governance.

2. The PWSSP will extend water supply coverage and treatment in Battambang, and Kampong Cham and sanitation coverage and wastewater treatment capacities with improved septage management in Battambang and Sihanoukville, and improved septage management in Kampong Cham. The project will also provide for the replacement of the failed interceptor sewer in the town of Siem Reap.

### B. Proposed Siem Reap Wastewater Subproject

## 1. Existing Facilities

3. The interceptor sewer is intended to connect to a WWTP of capacity 2,776m<sup>3</sup>/day, intended to serve only the central area of Siem Reap. The existing (failed) 600mm diameter sewer has a capacity of 25,800m<sup>3</sup>/day and the downstream section of 700mm diameter has a capacity of 30,070m<sup>3</sup>/day. The design capacity of the pump station at the downstream end of the interceptor sewer is 20,750m<sup>3</sup>/day.

4. Meantime wastewater treatment capacity in the city has increased following improvements to the WWTP under Korean funding, which also provided for two additional pump stations, however the commissioning of these awaits the restoration of the interceptor sewer to full functionality. The capacity of the WWTP has now been increased to 8,000m<sup>3</sup>/day however this can only treat about 50% of wastewater generated at the current time (2016), and even when extended to 16,000m<sup>3</sup>/day, it will not be of sufficient capacity include sewage from the eastern side of the city to 2030. A separate eastern WWTP will be required to serve the eastern zone.

#### 2. Proposed Improvements

5. An options study on construction methods and choice of pipe and vertical alignment were made, examining two key decisions. First, whether to use the same alignment and gradient as the existing pipe, and second, whether to use open trenches for the installation, or underground trenchless technology.

# **PROPOSED INTERCEPTOR SEWER IN SIEM REAP**



Figure 1: Alignment of Proposed Interceptor Sewer

6. The option of using a shallow alignment instead of a deep alignment was studied under the Siem Reap options study. This shallower alignment would necessitate multiple pump stations, while a deeper alignment would allow gravity flow. The study found that lifetime cost effectiveness was better for trenching up to a depth of 10 m without multiple in-line pumps.

7. The use of an open trench is problematic, where serious problems are anticipated with dewatering, achieving compaction of bedding material and backfill to support the pipe, operating in a deep trench, unavoidable lengthy road closures, and disruption and impairment of the main tourist centre and associated business activities.

8. The pipe will therefore follow the existing horizontal and vertical alignments. Trenchless technology using pipe thrusting, micro-tunnelling, pipe bursting or pipe cutting and bursting will be used. A Design. Build and Implement approach will allow contractors to present options from the full range of proven trenchless techniques methods available, in the interests of attracting cost competitive bids. Pipe thrusting entails thrusting or jacking the pipe from an access shaft using hydraulic rams while excavation ahead occurs through a cutting ring mounted on the leading pipe, and by feeding pipes into the pipe train as the work progresses along the length of pipe in guestion. Micro-tunnelling employs a small cutting head or tunnelling machine also mounted on the leading pipe. Bursting and cutting singularly, or in combination, utilizes the existing pipe cavity, cutting, fragmenting and dispersing the existing pipe material in the surrounding soil, using a conical "cutting head followed immediately by a bursting head" drawn through the old pipe. The bursting head base is larger than the pipe diameter being replaced and slightly larger than the new pipe diameter and the rear of the bursting head is attached to the new pipe. The front of the cutting head is connected to a cable or rod, which pulls the head through from an insertion pit to a reception pit, situated typically some 100m further along the pipe alignment. Pipe thrusting and micro-tunnelling also involves working in similar lengths along the pipeline. The Cities Development for Asia (CDIA) consultant handling the pre-engineering feasibility study has consulted an experienced contractor based in Singapore and confirmed that pipes of the desired diameter can be installed using the cutting and bursting technique.

9. The trenchless technology causes far less traffic and utility disruption than open trench techniques, but traffic flow will still be impeded. At the access (or insertion) pit site(s), a generator, compressor, hoist, operator cabin and stock of pipe sections are needed, taking up space on and around the urban road. For pipe thrusting, hoists will be required for the removal of excavated materials with space for loading for removal from site. At the reception pit site, less equipment is required. Due to the utilization of the existing pipe cavity, less spoil is generated by the technique than by conventional open trench installation. The subproject environmental management plan (EMP) incorporates provision for the safe and environmentally acceptable handling, transport and disposal of contaminated spoil and septage and fecal matter removed from the old pipeline.

10. Under the subproject, support will be given to communities for a range of activities to be in line with the objectives of the project. This will include (i) local area environmental improvements, through promoting the use of household and community level sanitation and drainage facilities, (ii) stakeholder consultation and public participation to raise awareness and provide organizational support to implement the awareness programs, (iii) support to district authorities in facilitating sanitation and hygiene behaviour change leading to significant health and hygiene benefits, and (iv) the management and operation public sanitation facilities. A web based reporting system (adopting a World Bank system) will be utilised to assist in identifying and reporting water supply problems such as burst pipes, water leaks, and sewer surcharges and overflows.

#### C. Rational for Due Diligence

11. The feasibility study design considered the alignment of the new interceptor pipe which, as indicated, is on public land following the horizontal and vertical alignments of the existing failed pipeline along the centreline of existing road right-of-ways. No private land acquisition is required. This will have to be reviewed in detail following the presentation of the design and build documents submitted by the successful contractor. However, as the new pipeline follows the existing pipe alignment no change is foreseen and the construction works will remain on public land as described in the preceding sentence. The road surface above the pipeline will remain unaltered and where excavations occur to open up the access and reception pits reinstatement to the levels and road surface finish will conform to the situation prior to the works.

12. Since preparation and submission of adequate social safeguards documents is a condition for ADB's approval of subproject loan, each component has been carefully reviewed in terms of involuntary resettlement and indigenous peoples (IP) impacts. In accordance with ADB's 2009 Safeguard Policy Statement and the Bank's OM Section F1/OP (January 2010) field validation and due diligence has confirmed that this subproject has no land acquisition and hence does not trigger the involuntary resettlement safeguard, and Indigenous People safeguards.

#### II. SCOPE OF LAND ACQUISITION

13. The land acquisition and involuntary resettlement (LAR) related fieldwork for this subproject took place in December 2016 and February 2017 and included joint transect walk of participating commune members, DPWT, and project preparatory technical assistance (PPTA) consultants.

14. The due diligence assessment on resettlement aimed at (i) using available public land rather than acquiring land for sites, and (ii) using the public right of way (RoW) to the extent possible, so that there are no impacts on owners and/or users of affected assets. This has been optimized by the due diligence consultant as a result of LARC fieldwork and surveys

15. For any temporary land acquisition for site installation or other areas needed for subproject activities, the contractor will have to propose in a site installation and access plan and obtain approval from the Project Implementation Unit (PIU). Where possible, public land will be used for temporary land use. The contractor shall lease the private space with agreed rental fee. Both private and public land shall be returned in the same or improved condition compared with presubproject situation. Through a transparent and contractual approach, the Employer will provide the contractor with the project's LARC principles to ensure that (i) official compensation rates are applied, (ii) re-instatement of affected assets contractually defined, (iii) consultation takes place, (iv) the grievance mechanism is followed, (v) the EMP is applied, and (vi) other items specified are complied with. The requirements for items (i) to (v) for compliance by the contractor and monitoring by the PIU.

#### A. Affected Person

16. Selected items are listed in *Table 1* and indicate, that there are no assets affected and therefore no affected owners and/or users to be reported. More details are given in the LARC fact finding and screening of *Appendix 1*. Pictureds are shown in *Appendix 2*.

	Item	Description
1	Loss of land	<ul> <li>No cases of temporary or permanent land acquisition to report.</li> </ul>
2	Loss of houses / structures	<ul> <li>No cases of primary/secondary structures on private land to report.</li> <li>In public RoW property road access points will be reinstated as part of construction work.</li> </ul>
3	Loss of crops	No cases of damaged crops to report.
4	Loss of trees	<ul> <li>No cases of loss of trees to report.</li> </ul>
5	Loss of services / resources	<ul> <li>No cases of loss of services and resources expected.</li> </ul>
6	Loss of Income	<ul> <li>No cases expected.</li> </ul>
7	Relocation	<ul> <li>No cases to report.</li> </ul>
8	Vulnerability support	<ul> <li>No cases of physical or economic displacement to report.</li> </ul>

Table 1: Summarized LAR Screening Overview

#### B. Assessment of Resettlement Impacts

17. The due diligence report (DDR) of the Subproject is prepared under the PPTA is based on ADB's Safeguard Policy Statement (SPS) 2009 and provisions of the RGC's Laws, Regulations and Policies on Land Acquisition. As indicated in Table 1 above, transact walk through the Subproject site validated no LAR requirements. However, there are minor impacts of assets and their owning affected households and/or users (traffic and/or temporary to access road or business). After the detailed engineering design and prior to the implementation of the Subproject, the GDR personnel with the assistance of project management unit (PMU) and PIU will be required to undertake a review of this due diligence, prepare a confirmation letter or report documenting any modifications on any resettlement aspects and submit to ADB, and receive no objection confirmation from ADB prior to the start of construction works. Table 2 illustrates an assessment of any involuntary resettlement impact during construction.

#### III. CONSULTATION, PARTICIPATION AND INFORMATION DISCLOSURE,

#### A. Consultation

18. For this subproject a preliminary inventory of loss and a survey of all AHs were carried out subsequent to the feasibility study feasibility study during due diligence assessment determining a record of preliminary measurements of type and level of loss related both related to AHs' eligibility of entitlements. These steps are embedded in a transparent consultation process with further public village meetings both during detailed design and construction stages as defined by RF of the PWSSP. The APs have been and will be properly informed on all of the subproject activities. The information includes the specific activities, schedules, impacts and mitigation measures. The information is provided through public meetings led by PIU, commune authorities and/or committees as required in the consultation and participation section of the RF.

#### B. Participation

19. Attending officials, as well as village representatives, households and families have been informed about the subproject in general and LAR aspects in particular. The subproject ensured that APs and other stakeholders have (a) obtained information about LAR aspects, and (b) opportunities to participate in the LAR process. An overview about the public commune meeting is given in **Appendix 3**.

#### C. Information Disclosure

20. The disclosure of LAR information, consultation and participation of residents in the subproject took place in 2 public commune meetings in February 2017. The contacted 54 commune residents (22 females and 32 males) have a good understanding about the subproject and its land acquisition related aspects. The contacted villagers (i) showed always high interest in the subproject and repeatedly mentioned their expectations towards the subproject, as water supply and sanitation are topics of high importance.

#### IV. IMPLEMENTATION SCHEDULE

21. In general, the planning and executing of LAR tasks are mainly related to the preconstruction phase for the Siem Reap interceptor sewer (a) the preparation of the design, build and implement bid documents during 2017, (b) document approval and (c) procurement, to be complete before start of the construction phase. Due to its impacts on tourism in the town the replacement of the interceptor has been accorded high priority and the design, build and implement contractor is to be procured by advance action during 2017, to enable the civil construction works to proceed immediately following loan effectiveness.

22. This means that the preparation of bid documents and procurement will be completed by January 2018 and that the construction works will take place over a period of some 15 months between the first quarter of 2018 and the first quarter 0f 2019 as defined by item 2 of the implementation schedule (see Figure 1 above). These activities will need to confirm that, as envisaged, there will be no need for acquisition of private land and that the subproject remains as Category C of ADB's defined project category on involuntary resettlement.

23. Inter-ministerial resettlement committee and PMU will ensure that contractor will not be issued notice to commence (notice to mobilize) to begin construction work unless (a) it has been confirmed that the subproject is Category C, or otherwise (b) a RP, if required, has satisfactorily been completed, approved, and compensation payment made; (c) ensured that income restoration program is in place for seriously AHs; and (d) areas required for civil works are free of all encumbrances.

#### V. CONCLUSION

24. Taking into consideration that there are no adverse impacts on private households, and communal/governmental asset are already available or would be made available if required, this Subproject is classified as Category C, as no involuntary resettlement impacts are included. Confirmation of any LAR will be confirmed at detailed engineering design stage of the Subproject. If LAR impacts are identified under the Subproject, the EA will follow the policies and procedures stipulated in the PWSSP's RF in compliance with the RGC's Laws and Regulations and SPS 2009 requirements of ADB on LAR.

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Figure 2: Overall PWSSP Project Implementation Schedule

# APPENDIX 1-1: LAND ACQUISITION AND RESETTLEMENT SCREENING & IR PROJECT CATEGORY

TECHNICAL DESCRIPTION			
FEATURES	YES	NO	
Upgrading or rehabilitation	x		Replacement and upgrading of existing 3.7 km length of failed interceptor sewer.
Construction of new physical facilities		x	
Beneficiaries of work	x		Immediate benefit to estimated 25,400 people in the vicinity, and tourism in the town.
MAIN COMPONENTS	YES	NO	DESCRIPTION
Access	x		Proposed works follow the alignment of the existing failed interceptor sewer generally along the centerline of existing public roads.
Wastewater treatment plant (WWTP)		x	
Sewer pump stations		х	
Sewer Network		x	
Septage facilities		х	
House connections		x	
Interceptor sewer	x		Rehabilitation of interceptor sewer by replacement on the same alignment and gradient with 1,000mm diameter DI pipe to replace the existing 600/700 mm diameter failed GRP pipe. Replacement on a 24/7 construction program using trenchless technology to minimize disturbance and disruption within Siem Reap town. Trenchless technology includes pipe thrusting, pipe boring, micro tunneling and pipe splitting and bursting
			with the contractor to propose option under design, build and installation contract.
IMPACTS ON LAND AND OTHER ASSETS AND RE	r	1	
GENERAL ASPECTS	YES	NO	EXPLANATIONS
Requirement of land acquisition		х	
Sites of land acquisition		x	Required sites are government land.
Easement utilized within existing RoW	x		Alignment of pipes
Permanent land acquisition		x	
Temporary land acquisition		x	If necessary for construction, then contractor to arrange.
Change of ownership of land		x	
Change of usage of land		х	

# APPENDIX 1-2: LAND ACQUISITION AND RESETTLEMENT SCREENING & IR PROJECT CATEGORY

IMPACTS ON LAND AND OTHER ASSETS AND RELATED FACILITIES/SERVICES										
Loss of A	Assets	YES	NO	DESCRIPTIO	N					
Loss of residential land			х	No land affected						
Loss of agricultural land			х	No primary or secondary private structures affecte						
Loss of residential structu	res		х	No damage to RoW as the pipe	will be constructed at					
Loss of productive structu	res		х	the centre of the road						
Loss of trees /crops			х							
EFFECTS ON COMMUNA	L/PUBLIC FACILITIES	YES	NO	DESCRIPTIO	N					
Loss of access to facilities	6		х							
Loss of access to services	3		х							
Loss of community assets	/ties		х							
Loss of cultural / historical	properties		х							
IMPACTS OF PEOPLE										
PHYSICAL DIS	PLACEMENT	YES	NO	EXPLANATIO	DNS					
Replacement of houses			х							
Relocation of households			х							
ECONOMIC DIS	PLACEMENT	YES	NO	Explanations						
Loss of incomes			х							
Loss of businesses/enterp	orises		х							
Loss of access to income	sources		х							
Loss of access to natural	resources		х							
AFFECTED HOUSE	HOLDS / PEOPLE	YES	NO	CASES AND NU	MBERS					
Number of AH/AP			х							
Vulnerable AH/AP			х	0 AHs						
Severely AH/AP			х							
Non-owning AHs (users o	f assets)		х							
FINDINGS										
Cate	egory			Categorization						
A Not applied by PWSSP				Feasibility Study	٨					
В				Design and Tendering						
С	$\checkmark$			Design, Construct and Install						
	are minor impacts of as			r owning affected households a	nd/or users (traffic and					
Note: The liste	ed items are in accordance	ce with	checkli	sts as defined by ADB guidelines						

	AP = affected person(s); AH = affected households; GRP = glass reinforced pipe; ha = hectare; km =
Abbreviation	kilometer; m3 = cubic meter; PWSSP = provincial water supply and sanitation project; uPVC =
	unplasticised polyvinyl chloride; WWTP = wastewater treatment plan

#### APPENDIX 2: PICTURED IMPRESSIONS FROM THE SUBPROJECT AREA



PHOTO 1 TECHNICAL MEETING BETWEEN PPTA AND DPWT



PHOTO 2 PUBLIC CONSULTATION MEETING VENUE: SIEM REAP MUNICIPALITY (SVEY DANGKUM COMMUNE)



PHOTO 3 PUBLIC CONSULTATION MEETING VENUE: SIEM REAP MUNICIPALITY (SVEY DANGKUM COMMUNE)



**PHOTO 4** RIGHT OF WAY TO INSTALL SEWER PIPE



PHOTO 5 RIGHT OF WAY TO INSTALL SEWER PIPE



**PHOTO 6** RIGHT OF WAY TO INSTALL SEWER PIPE

## APPENDIX 3.1: OVERVIEW AND SUMMARY OF PUBLIC LARC CONSULTATION MEETING

Subproje	Subproject: Waste Water Sub-project											
DATE	LOCATION AND TIME	FACILITATING ACTORS	PARTICIPANTS	DISCUSSION / RESPONSES / OUTCOMES FOLLOW-UP ACTIONS WITH RESPONSIBILITY								
08 February 2017	Commune/s: Svay Dangkum Venue: Siem Reap Municipality Time: 2:30 to 3:30PM Photo	<ul> <li>DPWT <ul> <li>Mr. Heab Me</li> </ul> </li> <li>PPTA consultant staff <ul> <li>Mr. Chea Sarin</li> </ul> </li> </ul>	Female: 11 Male: 21 Total: 32	<ul> <li>Presentation:</li> <li>Description of project and its current status;</li> <li>General introduction into resettlement;</li> <li>Explanation of Grievance Redress Mechanism;</li> <li>Indicating construction impacts of pipes in public Right-of-Way;</li> <li>Clarification on Environmental Construction Management (Traffic, access to plots, others);</li> <li>Briefing on loss of assets on sites for proposed infrastructure;</li> <li>Others.</li> <li>Comments – Questions – Answers: <ul> <li>Q1: Will the traffic still ongoing during the construction work?</li> <li>A1: Yes, the traffic can still operating while doing the construction work because we use high technology to drill the underground.</li> <li>Q2: When will the project started after today meeting?</li> <li>A2: The project may starting in 2019</li> <li>Q3: Will this drainage system have enough capacity to pump the wastewater?</li> <li>A3: Yes, it wills because we use the machine to pump it not let it flow.</li> <li>Q4: If I am the affected household, will I get compensation for the affected assets?</li> <li>A4: Yes, the compensation will be complying with the set policy under this project.</li> <li>Q5: How many person or household is eligible to file the complaint?</li> </ul> </li> </ul>								

## APPENDIX 3.1: OVERVIEW AND SUMMARY OF PUBLIC LARC CONSULTATION MEETING

Subproje Date	LOCATION AND TIME	FACILITATING ACTORS	PARTICIPANTS	DISCUSSION / RESPONSES / OUTCOMES FOLLOW-UP ACTIONS WITH RESPONSIBILITY			
09 February 2017	Commune/s: Svay Dangkum Venue: Siem Reap Municipality Time: 9:00 to 10:00AM Photo	<ul> <li>DPWT <ul> <li>Mr. Heab Me</li> </ul> </li> <li>PPTA consultant staff <ul> <li>Mr. Chea Sarin</li> </ul> </li> </ul>	Female: 11 Male: 11 Total: 22	Presentation:         • Description of project and its current status;         • General introduction into resettlement;         • Explanation of Grievance Redress Mechanism;         • Indicating construction impacts of pipes in public Right-of-Way;         • Clarification on Environmental Construction Management (Traffic, access to plots, others);         • Briefing on loss of assets on sites for proposed infrastructure;         • Others.         Comments – Questions – Answers:         Q1: When will the project started after this meeting?         A1: It may be started in 2009         Q2: If I am the affected household, will I get compensation for the affected assets?         A2: Yes, the compensation will be complying with the set policy under this project.			
		Totals					
	Number of meeting 2	Fem Male	sipants: ale 22 e: 32 il: 54				

VENUE: S	Svay Dangkum										
VENUE.	SIEM REAP MUNICIPA	ALITY, SVAY D		COMMUNE, SIE	M REAP DIS	STRICT,	SIEN	REAP PRO	OVINCE.		
Date: 0	08 February 2017										
PARTICIPANTS: I	ANT	PARTICIPANTS: VILLAGERS									
-	TOTAL 7 (FEMALE: 1	AND MALE: 6)					ТО	TAL 32 (FEI	MALE: 11 A	ND MALE	: 21)
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#### APPENDIX 3.2-1: ATTENDANCE LISTS OF PUBLIC LARC CONSULTATION MEETING

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ATE: (	)9 Februa	RY 2	.017											
ARTICIPANTS: FACILITATING COMMUNE, IA, PPTA CONSULTANT							PARTICIPANTS: VILLAGERS							
	Tot	FAL 5	5 (FEMALE: 0 A	ND MALE: 5)			TOTAL 22 (FEMALE: 11 AND MALE: 11)							
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#### APPENDIX 3.2-2: ATTENDANCE LISTS OF PUBLIC LARC CONSULTATION MEETING