



# Environmental Monitoring Report

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Project Number: 42266-023

July 2017

Period: December 2016 – May 2017

Part A: Main Report (Pages 1 – 98) and Annexures (Pages 99 – 114)

## IND: Kolkata Environmental Improvement Investment Program - Tranche 1

Submitted by

The Kolkata Municipal Corporation (KMC), Kolkata

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From: "Md. Ghulam Ali Ansari" <pdkeiip@gmail.com>  
 To: smajumder <smajumder@adb.org>  
 Cc: npokhrel@adb.org, Del Fabe <bfabe@adb.org>, Soumya Ganguly <soumya6@yahoo.com>, Narayan chandra Mondal <ncmcbs@yahoo.in>  
 Date: 20/06/2017 04:22 PM  
 Subject: Semi Annual Environmental Monitoring Report - Tranche-1 (December 2016 to May 2017)

Dear Sourav,

Kindly find attached herewith the "Semi Annual Environmental Monitoring Report" for the period of December, 2016 to May 2017, for your kind perusal.

With best wishes,

Md. Ghulam Ali Ansari, IAS  
 Project Director  
 Kolkata Environment Improvement Investment Programme  
 Kolkata Municipal Corporation



Kolkata  
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SEMR \_December to May

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# Semi-Annual Environmental Monitoring Report

ADB Loan Number 3053-IND

Period Covered: December 2016 to May 2017

**June 2017**

## **IND: KOLKATA ENVIRONMENTAL IMPROVEMENT INVESTMENT PROGRAM (KEIIP) – Project 1**

Prepared by Project Management Unit, Kolkata Environmental Improvement Investment Program, Kolkata Municipal Corporation, Government of West Bengal for Asian Development Bank



## KOLKATA ENVIRONMENTAL IMPROVEMENT INVESTMENT PROGRAM (KEIIP) – PROJECT 1

### PROJECT MANAGEMENT UNIT

6<sup>th</sup>  
SEMI ANNUAL ENVIRONMENT MONITORING REPORT  
TRANCHE 1  
ADB Loan 3053-IND  
(Period December 2016 to May 2017)

June 2017



KOLKATA MUNICIPAL CORPORATION

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**ABBREVIATIONS**

AAI	-	Airport Authority of India
ADB	-	Asian Development Bank
ASI	-	Archaeological Survey of India
BIS	-	Bureau of Indian Standards
BOD	-	Biochemical Oxygen Demand
CBO	-	Community Based Organization
COD	-	Chemical Oxygen Demand
CPCB	-	Central Pollution Control Board
CPHEEO	-	Central Public Health and Environmental Engineering Organisation
CTE	-	Consent to Establish
CTO	-	Consent to Operate
CW	-	Canal Water
DG	-	Diesel Generator
DO	-	Dissolved Oxygen
DPR	-	Detailed Project Report
DSC	-	Design and Supervision Consultants
DWF		Dry Weather Flow
KMC	-	Kolkata Municipal Corporation
EA	-	Executing Agency
EARF	-	Environmental Assessment and Review Framework
EIA	-	Environmental Impact Assessment
EMP	-	Environmental Management Plan
GRC	-	Grievance Redressal Committee
GRM	-	Grievance Redress Mechanism
GW	-	Groundwater
HC	-	Hydrocarbons
IEE	-	Initial Environmental Examination
INR	-	Indian National Rupee
KEIP	-	Kolkata Environmental Improvement Project
KEIIP		Kolkata Environmental Improvement Investment Program
KMC	-	Kolkata Municipal Corporation
KMDA	-	Kolkata Metropolitan Development Authority
LPG	-	Liquefied Petroleum Gas
MoEFCC	-	Ministry of Environment and Forest & Climate Change, Government of India
MTBM	-	Micro Tunnel Boring Machine
NIOSH	-	National Institute of Occupational Health
NGO	-	Non Government Organization
O and M	-	Operation and Maintenance
PMC	-	Project Management Consultant
PMU	-	Project Management Unit
PS	-	Pumping Station
REA	-	Rapid Environmental Assessment

ROW	-	Right of Way
RP	-	Resettlement Plan
S & D	-	Sewage & Drainage
SEIAA	-	State Level Environmental Impact Assessment Authority
SPM	-	Suspended Particulate Matter
SPS	-	Safeguard Policy Statement
STP	-	Sewage Treatment Plant
SWF	-	Storm Water Flow
SW	-	Surface Water
TDS	-	Total Dissolved Solids
TMP	-	Traffic Management Plan
TSS	-	Total Suspended Solids
UFW	-	Unaccounted For Water
USD	-	US Dollar
WBPCB	-	West Bengal Pollution Control Board
WTP	-	Water Treatment Plant

## I. INTRODUCTION

### A. Background

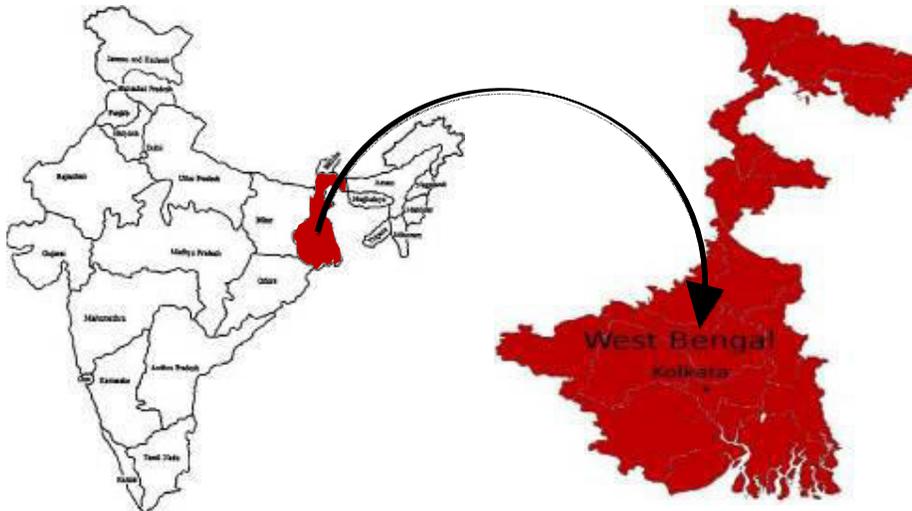
1. The completed Kolkata Environmental Improvement Project (KEIP) was a key urban infrastructure initiative of the Kolkata Municipal Corporation (KMC) and achieved improvement of the urban environment and quality of life in parts (mainly added areas) of Kolkata Municipal Corporation area. On completion of KEIP, both KMC & ADB agreed to continue their combined effort to arrest environmental degradation and to improve basic urban services of Kolkata by a multi - tranche financing program 'Kolkata Environmental Improvement Investment Program' (KEIIP). Figure in **Appendix 1** shows the areas of Kolkata considered to be taken up under KEIIP Tranche 1 & 2. On their part ADB expressed their willingness to support this program by providing a multi-tranche financing facility amounting to US \$400 million. Under Tranche 1 works, ADB has already released about US \$100 million and the remaining US \$300 million is expected for the proposed works under Tranche 2 & 3. The total investment duration for Tranche 1, 2 & 3 is from 2014 to 2022, whereas the duration for Tranche 1 works is from 2014 to 2019.

2. The goal of the Kolkata Environmental Improvement Investment Program is to support sustainable economic growth through improved quality of urban life and urban environment. The main objective of the Program is to improve service quality and operational sustainability of increased water supply and sewerage in 20% of the KMC area. The Investment Program also aims towards increase in operational efficiency and scale of water supply, sewerage and drainage services in 5% of KMC area.

3. The Program output comprises of:

- ✓ rehabilitation of inefficient and outdated water supply assets;
- ✓ continued extension of sewerage to newly developed areas and
- ✓ further development of financial and project management capacity.

4. The Program is being carried out at Kolkata by the Govt. of West Bengal (GoWB) acting through Kolkata Municipal Corporation (KMC) as the Executing Agency (EA). Location of Kolkata city in West Bengal is shown in **Figure 1**. Sub project location map for **Tranche 1 (Project 1)** is shown in **Figure 2**.



**Figure 1: Map showing the location of Kolkata City in West Bengal**

### B. Project & Report Purpose

5. Sub projects under **Project 1** has been classified by ADB as environmental assessment category B (some negative impacts but less significant than category A) and the

impacts of subprojects were assessed through Initial Environmental Examination (IEE), prepared according to ADB Safeguard Policy (SPS 2009).

6. This report is the semi-annual environment monitoring report (SEMR) covering period from **December 2016 to May 2017** and describes the implementation of the environmental management plan (EMP) in respect of each subproject as laid down in the approved IEE.

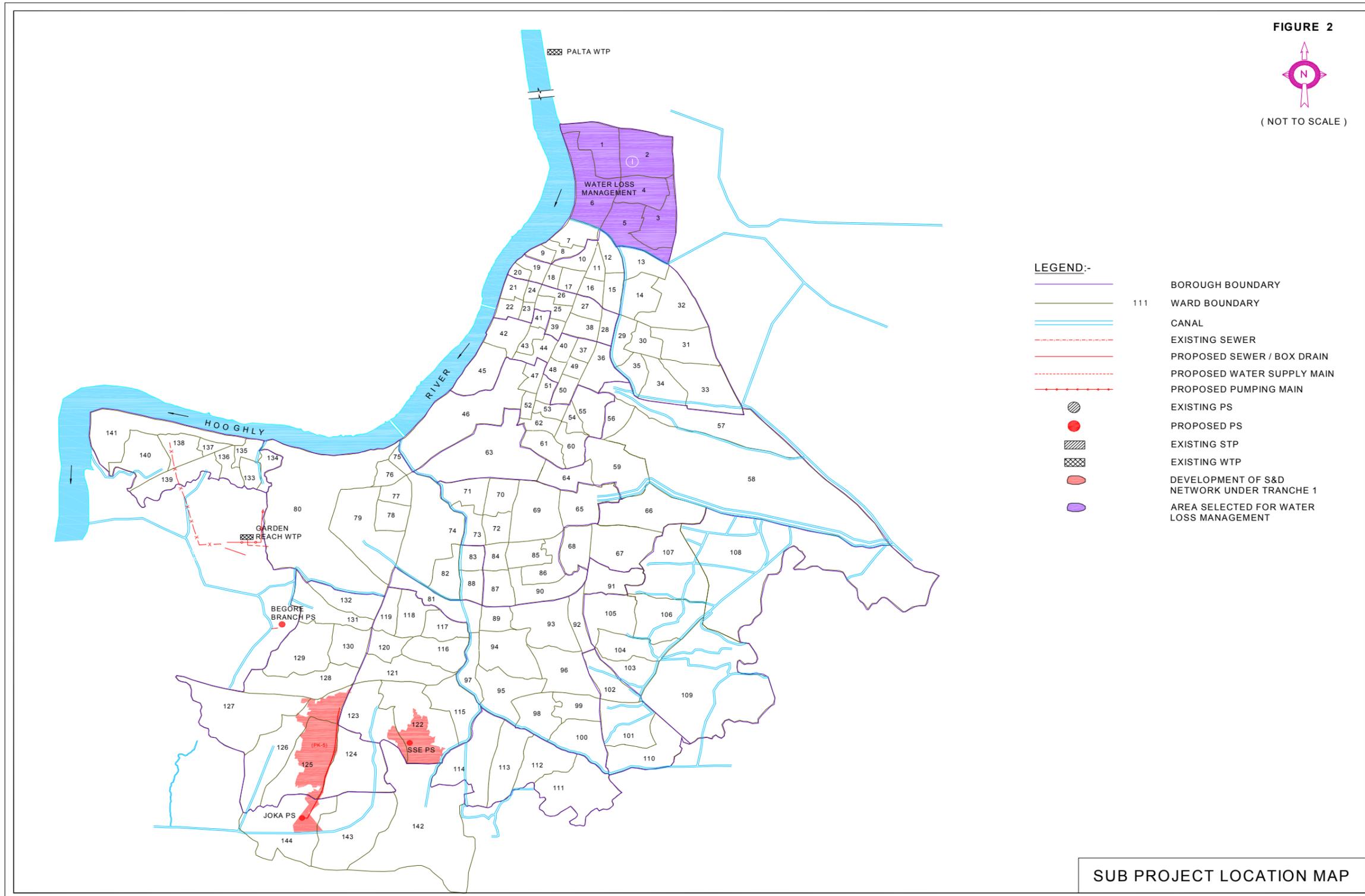


Figure 2: Sub Project location map- Project 1(Tranche 1)

## II. IMPLEMENTATION PROGRESS

### A. Status of Subprojects under Tranche 1

7. There are **9 packages** under **Tranche 1**. One package is related to Water Loss Management, one package related to building renovation, one package (in 2 lots) related to administrative component, one package for water supply, one package for Supply and Installation of pumps and Motors for water works, three packages related to sewage and drainage and one combined package related to micro-tunnelling for water and sewer pipeline. **Table 1** shows the subprojects under Tranche 1 and the works packages including the status of award of contracts as on 31<sup>st</sup> May 2017. The contract agreements for 9 packages have been signed and project implementation was initiated for all the 9 awarded packages. One package related to sewerage and drainage has been completed on 21<sup>st</sup> May 2016. Only one lot under one package (environment non sensitive) is to be awarded.

**Table 1: Summary of Subprojects under KEIIP Tranche 1 (on 31<sup>st</sup> May 2017)**

Sr. No.	Package No.	Package	Status
1	KEIIP/ICB/Tr-1/WS01/2015- 16	Performance Based Water Loss Management Works at Cossipore Service Zone, Ward no. 01 to 06	Procurement process completed. LoA issued on 4 <sup>th</sup> October 2016, date of commencement of contract - 21 <sup>st</sup> October 2016 <b>Work progress- 10.70%</b> (only design and engineering for Service Improvement Plan submission)
2	KEIIP/ICB/ Tr-1/WS02/2013-14	<b>Water supply</b> - Rehabilitation and Refurbishment of Water Works at Palta and Garden Reach	Procurement process completed. LoA issued on 14 <sup>th</sup> October 2014, Implementation started on 7 <sup>th</sup> November 2014 <b>Physical work under progress- 44.5%</b>
3	KEIIP/ICB/ Tr-1/WS03/2013-14 <b>Environment non-sensitive package</b>	<b>Water supply-</b> Supply and Installation of Pumps & Motors at, Tallah- Palta System and Garden Reach System	Procurement process completed. LoA issued on 16 <sup>th</sup> January 2014, Implementation started on 19 <sup>th</sup> May 2014 <b>Physical work under progress- 96.0%</b>
4	KEIIP/ICB/ Tr-1/WS & SD-04/13-14	<b>Water supply &amp; Waste water-</b> Laying of water trunk main from Garden Reach waterworks to Taratala valve station and laying of sewer line along Diamond Harbour Road by Micro tunneling method	Procurement process completed. LoA issued on 4 <sup>th</sup> March 2014, Implementation started on 19 <sup>th</sup> May 2014 <b>Physical work under progress- 78.67%</b>
5	KEIIP/ICB/ Tr-1/SD-05/13-14	<b>Waste water</b> - Construction of pumping stations in Begore khal and in Joka Tram Depot and Construction of Sewerage and Drainage Network within Diamond Harbour Road catchment	Procurement process completed. LoA issued on 1 <sup>st</sup> September 2014, Implementation started on 27 <sup>th</sup> October 2014 <b>Physical work under progress- 50.30%</b>
6	KEIIP/NCB/ Tr-1/SD-06/13-14	<b>Waste water-</b> Micro-tunneling works on pressure main from Santoshpur Pumping Station to Garden Reach Sewage	Procurement process completed. LoA issued on 16 <sup>th</sup> January

Sr. No.	Package No.	Package	Status
		Treatment Plant	2014, Implementation started on 19 <sup>th</sup> May 2014. <b>Work completed on 21.05.2016</b> <b>Physical work completed - 100.0 %</b>
7	KEIIP/ICB/ Tr-1/SD-07/15-16	<b>Waste water</b> – Construction of S & D Network and Pumping Station in Borough XIII (Ward 122) including Replacement of GAP Sewer Line in Borough XV, Laying of Pumping Main and Rehabilitation of SSE STP including Operation & Maintenance of the Pumping Stations(s) and STP	Contractor selected LOA issued on 12 <sup>th</sup> December 2015 Agreement signed on 4 <sup>th</sup> January 2016 and Notice to Proceed given for implementation on 5 <sup>th</sup> January 2016. Work started on 5 <sup>th</sup> January 2016. <b>Physical work under progress-23.0%</b>
8	KEIIP/NCB/TR-1/BR-08A/2015-16	Interior renovation of KEIIP office at Business Towers, 206 AJC Bose Road, Kolkata 700017 including Electrical works & Air-conditioning works	Contractor selected LOA issued on 9 <sup>th</sup> November 2015 Agreement signed on 2 <sup>nd</sup> December 2015 and Notice to Proceed given for implementation on 4 <sup>th</sup> February 2016. Work started on 4 <sup>th</sup> February 2016 <b>Physical work under progress-84.55%</b>
9	KEIIP/NCB/TR-1/BR-08B/2016-17 Lot 1 - Environment non-sensitive package	Supply and Installation of Software & Hardware for development of project accounting system	Bidding has been done on 16.02.2017 Financial evaluation under progress
	KEIIP/NCB/TR-1/BR-08B/2016-17 Lot 2 - Environment non-sensitive package	Supply and Installation of Geographical Information System (GIS) Software	Contractor selected LOA issued on 22 <sup>nd</sup> September 2016 Agreement signed on 4 <sup>th</sup> October 2016 Supply of software completed. Installation also completed. Training & integration remaining <b>Work progress: 50%</b>

8. **Table 2** shows the status of the awarded packages with details of components, starting date, and schedule date of completion, physical progress and progress of implementation of work components.

9. For all awarded packages, contractors have been mobilized and works are in different stages of implementation. **Appendix 2** shows implementation status of different components (package wise). Photo illustration of project locations is shown in **Appendix 3**.

**Table 2: Status of Awarded Subproject Under KEIIP Tranche 1 (As of 31<sup>st</sup> May 2017)**

Package No.	Component	Start Date	Number of Days/Months to Complete Work	Target date of completion	% Physical Progress as on 31 <sup>st</sup> May 2017	Works completed and continued as of 31 <sup>st</sup> May 2017
<b>KEIIP/ICB/Tr-1/ WS01/2015- 16</b>	<p>Performance Based Water Loss Management Works at Cossipore Service Zone, Ward no. 01 to 06</p> <ul style="list-style-type: none"> <li>Preparation of System improvement Plan SIP within specified period and according to the contract conditions. SIP Preparation &amp; Implementation shall include but not limited to the survey &amp; investigations of existing assets, distribution network, mapping, freezing selected DMA boundaries, hydraulic modelling, the necessity and the extent of rehabilitation required.</li> <li>Survey and investigations of transmission and distribution network for levels- project area- 9 sq km</li> <li>Supply, Laying, installation and commissioning of distribution network, length indicated herein, within tentative 25 DMAs selected in Cossipore zone, ward no. 1 to 6 (25,000 Connections: 24,750 nos. of House Service Connection for connections sizes between 15 NB to 32NB and balance connections are more than 40 NB)- 153 km</li> <li>Distribution System - Supply, Laying, installation and commissioning of distribution network with HDPE pipe- 13 km</li> </ul>	21.10.2016	36 months	20.10.2019	10.70% (only design and engineering for Service Improvement Plan submission)	<ul style="list-style-type: none"> <li>Mobilization of team for survey &amp; investigation completed. Office establishment work under progress.</li> <li>Kick off meeting – 15.12.2016</li> <li>Network Survey completed in consultation with KMC, Water Supply Dept for updating in GIS. Validation of networks is in progress.</li> <li>For creation of GIS ID, 10701 nos. premises verified in the field by GIS team out of 17550 premises &amp; digitized in the Map.</li> <li>Trial pit excavation, flow &amp; pressure measurement points completed for 118 Nos. out of 142 Nos.</li> <li>Topographical survey using DGPS completed &amp; survey with Digital level is in progress; 114 km completed till date out of 235 Km (approximately).</li> <li>Consumer survey completed for 9959 assesses/ occupants out of 37000 (approximately).</li> </ul>

Package No.	Component	Start Date	Number of Days/Months to Complete Work	Target date of completion	% Physical Progress as on 31 <sup>st</sup> May 2017	Works completed and continued as of 31 <sup>st</sup> May 2017
	<ul style="list-style-type: none"> <li>• Distribution System - Supply, Laying, installation and commissioning of distribution network with DI pipe- 140 km</li> <li>• Providing House Service Connections with MDPE/GI pipe on D.I pipe</li> <li>• Providing House Service Connections with MDPE/GI pipe on HDPE pipe</li> <li>• Providing and Installing Butterfly, Sluice Valves (DI), Bulk Flow Meters, PRV Valves</li> <li>• Finding invisible leaks in pipeline network, carrying out repairs and allied works within existing pipeline</li> <li>• SCADA system for distribution system management within the project area</li> </ul>					
KEIIP/ICB/ Tr-1/WS02/2013-14	<p><b>Water supply</b> - Rehabilitation and Refurbishment of Water Works at Palta and Garden Reach</p> <p><b>Palta Water Works:</b></p> <ul style="list-style-type: none"> <li>• Rehabilitation/ Strengthening of intake jetty 2</li> <li>• Strengthening of embankment/ construction of new embankment in between Pre settling tanks (length of 650 m) to facilitate movement of the vehicles for collection and removal of sludge disposed (including construction of pond)</li> </ul>	07.11.2014	48 months	06.11.2018	44.5	<p><b>Palta Jetty: Expected date of Completion: August 2017</b></p> <ol style="list-style-type: none"> <li>1. 27 nos. pile completed out of 27nos.</li> <li>2. 14 nos. fender beam concreting done out of 14 nos.</li> <li>3. Rubber fender reached at site.</li> <li>4. Grouting of bolt completed.</li> <li>5. Structural work for pipe supports completed</li> </ol> <p><b>Road between PST- Expected date of Completion: June 2017</b></p> <ol style="list-style-type: none"> <li>1. Under progress- bituminous work</li> </ol>

Package No.	Component	Start Date	Number of Days/Months to Complete Work	Target date of completion	% Physical Progress as on 31 <sup>st</sup> May 2017	Works completed and continued as of 31 <sup>st</sup> May 2017
	<ul style="list-style-type: none"> <li>Construction of road of width 5 m for a length of 75 m and width of 7.5 for a length of 1850 m. Including construction of culverts</li> <li>Relocation /restructuring of existing drain along a portion of the proposed road alignment to a covered drain length of 245 m</li> <li>Safe dismantling of existing 18 MGD WTP</li> <li>Construction of 20 MGD new WTP</li> </ul> <p><b>Garden Reach water works:</b> Rehabilitation and strengthening of existing jetty no. 1 at Garden Reach intake system</p>					<p><b>WTP- Expected date of Completion: April 2018</b></p> <ol style="list-style-type: none"> <li>Structural work of chemical &amp; chlorine house completed.</li> <li>Structural work of inlet channel completed</li> <li>Work of flash mixer completed.</li> <li>Switchgear room structural work completed.</li> <li><b>IPS Clarifier:-</b> 2nos. Completed upto platform level. 2 nos. completed up to 50% wall.</li> <li><b>Flocculator:</b> 3 nos. completed upto platform level. 1 no. completed up to 50% wall.</li> <li><b>Filter House:</b> Raft completed</li> <li><b>Sludge tank :</b> Concreting for 6<sup>th</sup> lift done</li> <li><b>Dirty back wash tank :</b> 3<sup>rd</sup> lift done &amp; sinking under progress</li> <li><b>Raw water line:</b> Valve chamber work completed. Pipe laying under progress.</li> <li>Air blower &amp; transformer reached at site.</li> </ol> <p><b>Road &amp; Culvert:- Expected date of Completion : April 2018</b></p> <ol style="list-style-type: none"> <li>5 nos. culverts completed up to top slab. 2 nos. additional culverts completed.</li> <li>Alum storage room completed.</li> <li>Switchgear room flooring under progress.</li> <li><b>Road completed excluding</b></li> </ol>

Package No.	Component	Start Date	Number of Days/Months to Complete Work	Target date of completion	% Physical Progress as on 31 <sup>st</sup> May 2017	Works completed and continued as of 31 <sup>st</sup> May 2017
						<p><b>bituminous work</b> - 700 m. Bituminous work done – 330m. <b>5. Road under construction</b> – 150 m. <b>6. Road till to start</b> – 730 m. <b>Garden Reach Jetty: Expected date of Completion: December 2017</b> 3 nos. pile completed</p>
KEIIP/ICB/ Tr-1/WS03/2013-14 <b>Environment non – sensitive package</b>	<p><b>Water supply-</b> Supply and Installation of Pumps &amp; Motors at,</p> <ul style="list-style-type: none"> <li>Tallah- Palta System</li> <li>Garden Reach System</li> </ul>	19.05.2014	24 months	18.05.2016	96.0	<p>1.Tallah - Completed &amp; commissioned 2. Palta- Work completed. One pump commissioning requires shutdown. 3. GRWW- Work completed. One capacitor &amp; 1 Control Panel could not be commissioned due to work of shut down.</p>
KEIIP/ICB/ Tr-1/WS & SD-04/13-14	<p><b>Water supply &amp; Waste water-</b> Laying of water trunk main from Garden Reach waterworks to Taratala valve station and laying of sewer line along Diamond Harbour Road by Micro tunneling method</p> <p><b>Water Supply part -</b></p> <ul style="list-style-type: none"> <li>Transmission main from Garden reach water works to Taratala valve station by micro tunnelling, approx length 4.05 km MS pipe 1829 dia (Out Dia.)</li> </ul> <p><i>Additional scope includes Laying of water main pipe line (1100 m long) by micro tunnelling from shaft 13 to 16</i></p>	19.05.2014	36 months	18.05.2017 (Extension under process)	78.67	<p><b>Taratala Road (Water Main):-</b></p> <p>1. 13 nos. shaft completed out of 13 nos.(original scope). 4nos. shaft construction completed out of 4 nos. (additional scope)</p> <p>2. Micro tunnelling of pipe completed (original scope)&amp; additional scope (1160.0m) 3. Welding joint &amp; UT of pipe about 4400m completed. 4. Hydraulic Testing 4400 m completed. 5. Shaft construction completed at</p>

Package No.	Component	Start Date	Number of Days/Months to Complete Work	Target date of completion	% Physical Progress as on 31 <sup>st</sup> May 2017	Works completed and continued as of 31 <sup>st</sup> May 2017
	<p>(from near Taratala valve station to S. N. Roy Market on James Long Sarani)- Length – 5.1 km, Diameter – 1,500mm and 1829 mm dia (OD) , Method of laying – Micro-tunneling (major part) + open cut</p> <p><b>Waste water part-</b></p> <ul style="list-style-type: none"> <li>Reinforced cement concrete (RCC) gravity main sewer from Sakher bazaar to Joka along Diamond Harbour Road by micro tunnelling, approx length 4.069 km RCC pipe 1400mm -2400 mm dia</li> </ul> <p>Addition of micro tunnelling from Joka PS to Churial canal approx distance of 290 m (with small open cut sections), 1829 mm OD MS pipe.. Lateral connection from western and eastern flank of DH Road</p>					<p>No. 13,14,15 &amp; 16 (additional scope). 6. Pipe laying work within GRWW in progress(original scope). 7. UT &amp; hydro test is completed from shaft no 0 to 15 &amp; shafts 15 to 16 UT is in progress.</p> <p><b>D. H. Road (Sewerage):-</b></p> <ol style="list-style-type: none"> <li>22 nos. shafts completed out of 24 Nos. and shaft no.4 work is completed.</li> <li>Micro tunnelling of 3660 m pipe completed out of 4010m</li> <li>18 nos. Manhole completed out of 24 nos.</li> <li>3 nos. pressure main shaft completed out of 3 nos. (additional scope) &amp; micro tunnelling of 270.80 m pipe completed. (additional scope)</li> <li>Inlet chamber completed at Joka PS.</li> <li>Lateral connection by jack pushing – 4 nos. completed &amp; 2 nos. work in progress out of 12 nos.</li> </ol>
<b>KEIIP/ICB/Tr-1/SD-05/13-14</b>	<p><b>Waste water</b> - Construction of pumping stations in Begore khal and in Joka Tram Depot and Construction of Sewerage and Drainage Network within Diamond Harbour Road catchment</p> <ul style="list-style-type: none"> <li>Construction of Sewage and Drainage networks within Diamond Harbour Road catchment area</li> </ul>	27.10.2014	42 months	26.04.2018	50.30	<p><b>Begore Khal PS</b></p> <ol style="list-style-type: none"> <li>Well sinking work of &amp; bottom plugging of well is completed – top slab bank casting completed.</li> <li>2 nos. transformer &amp; 1set LT Panel with capacitor bank installation is completed.</li> <li>5 nos. pump arrived at site</li> <li>Box Duct for pumping main 100%</li> </ol>

Package No.	Component	Start Date	Number of Days/Months to Complete Work	Target date of completion	% Physical Progress as on 31 <sup>st</sup> May 2017	Works completed and continued as of 31 <sup>st</sup> May 2017
	<p>including house drainage connections (ward 125 &amp; 126) Approx length- 17.5 km and dia <math>\geq</math>250 mm</p> <ul style="list-style-type: none"> <li>• Construction of RCC box drain inside Behala AAI land</li> <li>• Construction of Joka pumping station inside Joka Tram depot. – <ul style="list-style-type: none"> <li>✓ DWF pumping main of dia 800 mm, approx. 3250 m long</li> <li>✓ SWF pumping main of dia 1626 mm, approx. 500 m long</li> </ul> </li> <li>• Construction of Begore khal pumping station located inside Behala Airport Authority of India Area <ul style="list-style-type: none"> <li>✓ DWF pumping main of dia 400 mm, approx. 675 m long</li> <li>✓ SWF pumping main of dia 1626 mm, approx. 270 m long</li> </ul> </li> <li>• Desalting and re-sectioning of Bagore branch canal for the portion downstream of box drain upto its outfall at Bagore canal</li> </ul> <p><i>Extra work- Construction of PS R. K. Ghosh and Behala flying club, Sewer line, including house drainage</i></p>					<p>completed</p> <p>5. Begore branch canal rehabilitation completed. Laying of pumping main 1300dia MS pipe completed 150m under box drain &amp; 50m under ground by open cut method &amp; RCC wall casting is in progress</p> <p>6. Raft casting completed for screen chamber.</p> <p><b>Joka PS</b> - Targeted commissioning date : June '17</p> <ol style="list-style-type: none"> <li>1. Well sinking work &amp; bottom plugging of well is completed.</li> <li>2. 2nos. transformer, 1 set LT Panel with capacitor bank installation is completed.</li> <li>3. 11 nos. pump arrived at site.</li> <li>4. Raft casting completed for screen chamber &amp; RCC wall casting is in progress.</li> </ol> <p><b>S &amp; D Network</b></p> <ol style="list-style-type: none"> <li>1. 7.962Km sewer line completed out of 16.66 Km.</li> <li>2. DI Pipe at Mahendra Banerjee Rd. 1380m out of 1430 m</li> </ol> <p><b>Additional Works</b></p> <ol style="list-style-type: none"> <li>1. Behala Flying Club (near cultural field at Kalimata) – Extension of screen chamber is completed. Concrete cutting for screen chamber completed.</li> </ol> <p>Concrete cutting for enlarging opening of sluice gates, inlet / outlet of screen chamber &amp; well connection</p>

Package No.	Component	Start Date	Number of Days/Months to Complete Work	Target date of completion	% Physical Progress as on 31 <sup>st</sup> May 2017	Works completed and continued as of 31 <sup>st</sup> May 2017
						<p>is completed. Installation of sluice gate completed. and screening arrangement is also completed 4 nos..DWF pumping arrangement except conveyor arrangement re-installation is completed and reached at site &amp; 1 no. is in progress</p> <p>DWF pumping scheme commissioned through bypass arrangement.</p> <p>SWF pumping arrangement modification also in progress &amp; 2nos. SWF pump commissioned</p> <p>Additional arrangement of dewatering pump set kept at site for operation during emergency.</p> <p>Enlargement of incoming sewer to pump house is in progress.</p> <p>2. Upen Banerjee Road – Sewer line, including house drainage connection, road works &amp; kerb-channel fixing completed.</p> <p>3. R.K.Ghosh Pumping Station – DWF pumps &amp; mechanical screen in operation</p> <p>4. Noapara Pumping Station – Sluice gate installed.</p>
<b>KEIIP/NCB/ Tr-1/SD-06/13-14</b>	<b>Waste water-</b> Micro-tunneling works on pressure main from Santoshpur Pumping Station to Garden Reach Sewage Treatment Plant Pressure main between Santoshpur Main pumping station (MPS) and	19.05.2014	18 months	28.02.2016	100.0	<b>All work completed during last report period</b>

Package No.	Component	Start Date	Number of Days/Months to Complete Work	Target date of completion	% Physical Progress as on 31 <sup>st</sup> May 2017	Works completed and continued as of 31 <sup>st</sup> May 2017
	Garden Reach Sewage Treatment Plant (STP) by micro tunnelling approx. Length 525 m, 1800 mm inner dia, RCC NP-4 pipe					
<b>KEIIP/ICB/ Tr-1/SD-07/15-16</b>	<p><b>Waste water</b></p> <ul style="list-style-type: none"> <li>Replacement of GAP line (approx. 3.3 km) for defunct portion (From Gandhi Maidan to Karbala Unnayan Samity and upto Santoshpur Main Road), Extension of Existing drain, Construction of energy dissipater chamber, Desilting of GAP sewer for portion of sewer to be – utilized, Interconnection between sumps at Santoshpur SMPS,. CCTV survey for entire length of sewer about 4.0 km</li> <li>Development of S &amp; D network in Ward 122 (part) (length of sewer Approx. 5.0 km),</li> <li>Laying of Pumping main (700 mm diameter about 2.7 km length DI K9 pipe) along Taratala Road and Santoshpur Road from Trenching Ground Sewage PS to Santoshpur Main Sewage PS</li> <li>Construction of South Suburban East combined pumping station (capacity DWF – 76 lps and SWF – 4000 lps)</li> </ul>	05.01.2016	18 months	04.07.2018	23.0	<ol style="list-style-type: none"> <li><b>GAP sewer</b> – 15 m 900 mm dia pipe laid, rest under progress</li> <li><b>Pumping Main from TG PS to SPS</b> – 700 m completed, rest under progress</li> <li><b>S&amp;D network at Ward 122</b>-Pipe laying work 2700 m completed out of 4300 m, rest under progress</li> <li><b>Pumping Station at SSE</b> – Sinking of wet well and dry pit well steining wall in progress. Superstructure work of substation building in progress</li> <li><b>SSE STP renovation</b>-Rehabilitation of 3 ponds completed out of 6 ponds</li> </ol>

Package No.	Component	Start Date	Number of Days/Months to Complete Work	Target date of completion	% Physical Progress as on 31 <sup>st</sup> May 2017	Works completed and continued as of 31 <sup>st</sup> May 2017
	<ul style="list-style-type: none"> <li>Construction of DWF and SWF pumping mains from SSE PS (300 mm dia. DI, K-9 pipe – 950m length for DWF &amp; 1400 mm dia. MS pipe – 1500 m length for SWF)</li> <li>Rehabilitation of SSE STP</li> </ul>					
<b>KEIIP/NCB/TR-1/BR-08A/2015-16</b>	Interior renovation of KEIIP office at Business Towers, 206 AJC Bose Road, Kolkata 700017 including Electrical works & Air-conditioning works	04.02.2016	12 months	03.02.2017	84.55	<ol style="list-style-type: none"> <li>2nd floor - Block 'A' – Work completed. Some miscellaneous works are in progress. Block 'B' – Work completed. Some miscellaneous works are in progress. Block 'C' – Brick work &amp; plastering, plumbing, floor tiles, partition work, wood work completed. Electrical work, A.C., painting work &amp; some miscellaneous works are in progress.</li> <li>3rd floor - Block 'A'- Masonry work &amp; floor tiles work is in progress</li> <li>3rd floor - Block 'B' – Work completed. Some miscellaneous work are in progress. Block 'C' – Work completed. Some miscellaneous works are in progress.</li> <li>4th floor - Block 'B' - Works completed. Some miscellaneous works are in progress. Block 'A' – Work completed. Some miscellaneous work in</li> </ol>

Package No.	Component	Start Date	Number of Days/Months to Complete Work	Target date of completion	% Physical Progress as on 31 <sup>st</sup> May 2017	Works completed and continued as of 31 <sup>st</sup> May 2017
						<p>progress.</p> <p>Block 'C' – Work completed. Some Miscellaneous works are in progress.</p> <p>5. 5<sup>th</sup> floor - Block 'B' –Work completed. Some miscellaneous work are in progress.</p> <p>6. 5<sup>th</sup> floor- Block 'A' –Brick work, masonry work floor tiles, ceramic tiles, partitioning work completed. Rendering, electrical, A.C. work are in progress.</p> <p>7. Block 'C' – Masonry work &amp; floor tiles work and Ceramic tiles, completed. Rendering, electrical work , server room work , AC works are in progress</p>
<b>KEIIP/NCB/TR-1/BR-08B/2016-17 Lot 2 Environment non – sensitive package</b>	Supply and Installation of Geographical Information System (GIS) Software	04.10.2016	3 months	03.01.2017 (Date to be extended)	50.0	Supply of software completed. Installation also completed. Training & integration remaining

**B. Compliance of Safeguard Loan Covenants**

10. The loan agreement for KEIIP Project 1 was signed on 3<sup>rd</sup> March 2014 and details are available in ADB website (<http://www.adb.org/projects/documents/loan-agreement-kolkata-environmental-improvement-investment-program-project-1>). **Table 3** provides a summary of compliance to the loan covenants related to environmental safeguards.

**Table 3: Compliance of Loan Covenants – Environment part**

Serial no. as per loan agreement	Program Specific Covenants	Status / Issues
<b>Environment</b>		
7	The Borrower shall ensure or cause the EA to ensure that the preparation, design, construction, implementation, operation and decommissioning of the Project, and all projects' facilities comply with (i) all applicable laws and regulations of the Borrower and the State relating to environment, health, and safety; (ii) the Environmental Safeguards; (iii) the EARF; and (iv) all measures and requirements set forth in the respective IEE and EMP, and any corrective or preventative actions set forth in a Safeguards Monitoring Report.	<p><b>Under compliance</b></p> <p>Document is prepared/ or under preparation by complying all relevant State and National Laws, Safeguard Policy Statement (SPS 2009) of ADB, Environment Assessment Review Framework (EARF) for Tranche-1 program.</p> <p>For <b>Tranche 1</b> project Initial Environmental Examination (IEE), Environment Management Plan (EMP) report prepared and approved by ADB.</p> <p>IEE for Sewage and Drainage for Tranche 1 has been updated and that report has already been disclosed in ADB website on October 2015.</p> <p>IEE for water supply for Tranche 1 has been updated and that report has already been disclosed in ADB website on February 2016</p> <p>IEE will be revised further in case of any change of scope and location.</p> <p>All measures and requirements as prescribed in IEE/EIA and EMP are being considered during implementation. Corrective or preventive action plans will be reflected in Environment Monitoring Report and project implementation authority will take care of such actions when required.</p>
<b>Human and Financial Resources to Implement Safeguards Requirements</b>		
11	The Borrower shall make available, or cause the EA to make available, all necessary budgetary and human resources to fully implement the EMP required.	<p><b>Complied</b></p> <p>Budgetary provisions have been included in EMP of Tranche 1 project</p> <p>An Environment Specialist has been placed in Project Management Unit and heading Safeguard Monitoring Unit.</p> <p>Human resource (project consultant, i.e Environmental Specialist of DSC) for implementation of EMPs is in place for regular monitoring to secure complete compliance.</p>

Serial no. as per loan agreement	Program Specific Covenants	Status / Issues
<b>Safeguards – Related Provisions in Bidding Documents and Works Contracts</b>		
12.	<p>The Borrower shall ensure, or cause the EA to ensure, that all bidding documents and contracts for Works contain provisions that require contractors to:</p> <p>(a) comply with the measures and requirements relevant to the contractor set forth in the IEE, the EMP, the RP and the IPP (to the extent they concern impacts on affected people during construction), and any corrective or preventative actions set out in a Safeguards Monitoring Report;</p> <p>(b) make available a budget for all such environmental measures;</p> <p>(c) provide the EA with a written notice of any unanticipated environmental risks or impacts that arise during construction, implementation or operation of the Project that were not considered in the IEE, the EMP, the RP or the IPP;</p> <p>(d) adequately record the condition of roads, agricultural land and other infrastructure prior to starting to transport materials and construction; and</p> <p>(e) fully reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction.</p>	<p><b>Under compliance</b></p> <p>(a) Approved IEE, EMP for Tranche 1 project is attached in Bidding documents. This process will be followed for all the sub projects within the present Tranche. In case of any change of scope, revised IEEs with EMP(s) will be prepared and corrective measures will be disclosed to the contractor and same will be reflected in the “Environment Monitoring Report”.</p> <p>IEE for Sewage and Drainage for Tranche 1 has been updated and that report has already been disclosed in ADB website on October 2015.</p> <p>IEE for water supply for Tranche 1 has been updated and that report has already been disclosed in ADB website on February 2016</p> <p>(b) IEE indicates budgetary provisions for implementation of EMP.</p> <p>(c) During implementation of any sub project if additional impacts/risks arise due to change in scope/area that will be reflected in the revised IEEs, EMPs and Environment Monitoring Report and accordingly project Executing Agency will inform the Construction Agency for taking relevant corrective measures.</p> <p>(d) Haul roads will be marked properly (by avoiding residential and agricultural land) before commencement of transportation of materials.</p> <p>(e) Pathways, infrastructure and land which are likely to be affected for varying periods during implementation of the sub project will be restored by concerned construction agency before acceptance of the work. Restoration status will be reflected in post construction monitoring report.</p>
<b>Safeguards Monitoring and Reporting</b>		
13	<p>The Borrower shall cause the EA to do the following:</p> <p>(a) submit semi-annual Safeguards Monitoring Reports to ADB and disclose</p>	<p><b>Under compliance</b></p> <p>(a) This is 6<sup>th</sup> Semi-annual safeguard monitoring report on Environment for the</p>

Serial no. as per loan agreement	Program Specific Covenants	Status / Issues
	<p>relevant information from such reports to affected persons promptly upon submission;</p> <p>(b) if any unanticipated environmental and/or social risks and impacts arise during construction, implementation or operation of the Project that were not considered in the IEEs, the EMPs, promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan; and</p> <p>(c) report any breach of compliance with the measures and requirements set forth in the EMPs, promptly after becoming aware of the breach.</p>	<p>period December 2016 to May 2017. The next report will be due by end of November 2017.</p> <p>(b) During implementation of any sub project, if additional impacts/risks arise due to change in scope/area, those will be reflected in revised IEEs with EMPs and accordingly Executing Agency (EA) will inform the ADB such change along with corrective action plan which will be reflected in the subsequent Monitoring Reports.</p> <p>(c) in case of any breach of compliance with the measures and requirements set forth in the EMP, EA will promptly inform ADB and suitable corrective action program will be planned/initiated.</p>
<b>Prohibited List of Investments</b>		
14	The Borrower shall ensure or cause the State to ensure that no proceeds of the Loan are used to finance any activity included in the list of prohibited investment activities provided in Appendix 5 of the SPS.	<b>Complied</b> Under Tranche -1, there is no violation of prohibited investment activities as per ADB SPS (2009) Appendix 5.
<b>Other Social Measures</b>		
15	The EA shall ensure that civil works contracts under the Project follow all applicable labor laws of the Borrower and the State, and that these further include provisions to the effect that contractors: (i) carry out HIV/AIDS awareness programs for labor and disseminate information at worksites on risks of sexually transmitted diseases and HIV/AIDS as part of health and safety measures for those employed during construction; and (ii) follow and implement all statutory provisions on labor (including not employing or using children as labor, equal pay for equal work), health, safety, welfare, sanitation, and working conditions. Such contracts will also include clauses for termination in case of any breach of the stated provisions by the contractors.	<b>Complied in Bid documents and being complied during implementation</b> Provision are included (as per EMP & BID document) to carry out HIV/AIDS awareness programs for construction contractor, application of all relevant labour laws for health and safety including child labour law and engagement of local labours (preferably from economically backward group) covering women labours. In case of any breach of provision, necessary corrective measures as per contract clauses shall be taken. All activities including awareness program will be reflected in "Monitoring Report".

**C. Implementation Arrangement**

11. The institutional arrangement follows KEIIP’s organizational structure and functions (Figure 3). The subproject is being implemented and monitored by the Project Management Unit (PMU). The KEIIP’s PMU Environment Specialist is the overall in-charge on Environmental safeguard of the program. The responsibilities of the Environmental Specialist ensures that (i) environmental safeguard issues are addressed; (ii) EMP/approved Site Environment Plan (SEP) is implemented; (iii) physical and non-physical activities under the subproject are monitored; and (iv) monitoring reports are prepared on time and submitted to ADB. Safeguard Monitoring Unit (SMU) of PMU is ensuring field level monitoring and safeguard documentation.

12. PMU is supported by the Design and Supervision Consultants (DSC). An Environment Specialist is in place to ensure: (i) EMP/ approved SEP is implemented; (ii) surveys and measurements are undertaken; (iii) inspections and observations throughout the construction period are recorded to ensure that safeguards and mitigation measures are provided as intended; and (iv) statutory clearances and permits from government agencies/other entities are obtained prior to start of civil works.

13. The Safeguards Monitoring Unit will:

- (i) prepare the REA checklist, draft the EIA/IEE and arrange for disclosure of the approved EIA/IEE in the website
- (ii) ensure that Environmental Clearance (EC), Consent to Establishment and Consent to Operate and other certificates, as required, are obtained in time from appropriate authorities and ensure compliances with conditions imposed.
- (iii) ensure incorporation of the EMP, environmental mitigation and monitoring measures into the contract documents
- (iv) monitor disclosure and public consultation arranged by DSC during IEE process and ensure that comments are reflected in the IEE report
- (v) ensure disclosure of information throughout the duration of the subproject through suitable visual means and publications
- (vi) provide necessary input for grievance redress
- (vii) approve contractor's proposed locations for construction work camps, storage areas, hauling roads, lay-down areas, and disposal areas for solid and hazardous wastes on recommendations of DSC
- (viii) guide the Contractor for drawing up of Site Environmental Management Plan and to approve the same
- (ix) induct the Contractor for taking up the construction following environmental and social safeguards
- (x) facilitate scheduled monitoring during implementation of the project.
- (xi) carry out regular onsite monitoring and guide the Contractor to adopt the required site management standard.
- (xii) ensure the required health and safety measures at work sites
- (xiii) obtain in time and to review the monthly monitoring report of the Contractors
- (xiv) prepare 6-monthly monitoring and EMP implementation report, including the status of project compliance, statutory clearances and relevant loan covenants, and submit the approved 6-monthly report to ADB and seek permission to disclose the same in the investment program website
- (xv) prepare monitoring report on post-construction activities by the contractors as specified in the EMP

14. The Contractor's responsibilities included:

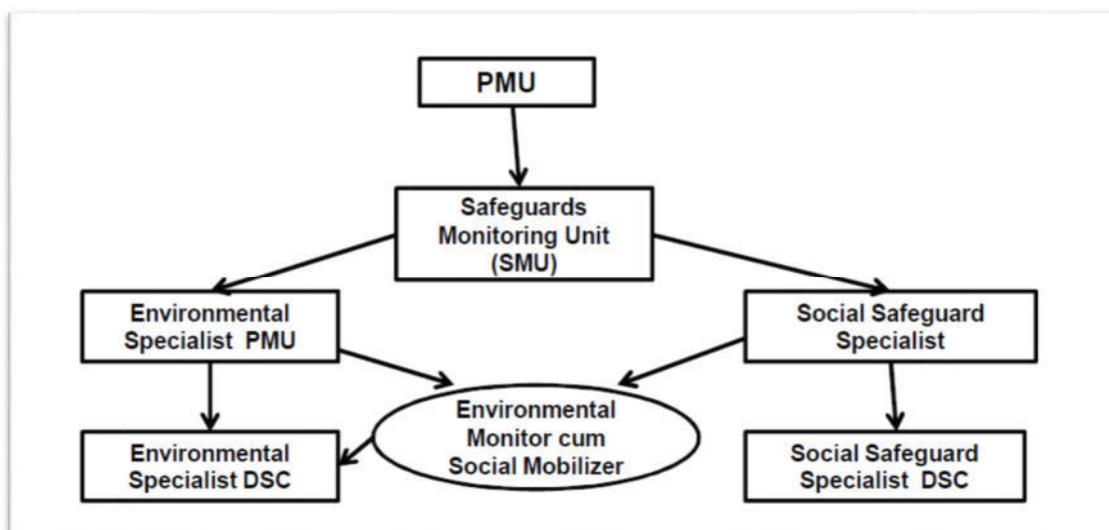
- (i). Submission of Site environmental plan (SEP) covering proposed sites / locations for construction work camps, storage areas, haul roads, lay down areas, disposal areas for solid and hazardous wastes
- (ii). Compliance with all applicable legislation and be conversant with the requirements of the EMP/ approved SEP;

- (iii). Briefing of his staff, employees, and labourer about the requirements of the EMP/ approved SEP;
- (iv). Ensuring that any sub-contractors/suppliers engaged within the context of the contract comply with the environmental requirements of the EMP/ approved SEP. The Contractor will be held responsible for non-compliance on their behalf;
- (v). Providing methodology/information for all activities requiring special attention as specified and/or requested by the DSC Environment Specialist during the duration of the Contract;
- (vi). Providing environmental awareness training to staff, employees, and laborers;
- (vii). Bearing the costs of any damages/compensation resulting from non-adherence to the EMP/ approved SEP or written site instructions;
- (viii). Conducting all activities in a manner that minimizes disturbance to directly affected residents and the public in general, and foreseeable impacts on the environment.
- (ix). Ensuring that the PMU and DSC Environment Specialists are timely informed of any foreseeable activities that will require their expert input

15. Environment Specialist and Junior Environmental Scientist of DSC visited all construction sites every month and arranged onsite training program for contractors and supervisory staff and instructed contractors for application of corrective action measures to mitigate impacts. **Table 4** shows detail of environment safeguard team for KEIIP.

**Table 4: Details of KEIIP Environmental Safeguard Team**

Designation	Name and Contact Details
PMU, Environment Specialist Safeguard Monitors in SMU	Name: Dr. Chinmoy Chakrabarti Office Address: Unnayan Bhawan, 206 A. J. C Bose Road, Kolkata 700017 Phone:033 2283 0169 Email:pdkeip@gmail.com, chin_moy@yahoo.com
DSC, Environment Specialist	Name: Dr. Ardhendu Mitra Office Address: Unnayan Bhawan, 206 A. J. C Bose Road, Kolkata 700 017 Phone:033 2283 0044, 9830415953 Email: ardhendumitra@gmail.com , dsckeip@gmail.com
DSC, Junior Environmental Scientist (Support)	Name: Ms Rukmini Chakrabarty Office Address: Unnayan Bhawan, 206 A. J. C Bose Road, Kolkata 700 017 Phone:033 2283 0044, 9007380908 Email:dsckeip@gmail.com, chakrabarty.rukmini@gmail.com



Notes: PMU = project management unit; DSC = design and supervision consultants

**Figure 3: Institutional Arrangement – Safeguards**

**III. Environmental Procedure Review**

**A. Environmental Legal Requirement**

16. For implementation of the project both national and state rules & regulations need to be followed. **Table 5** in next section indicates environment legal requirement for the projects under KEIP.

**B. Compliance with Environmental Legal Requirements**

17. Before implementation of the project, compliance with environmental policy, law and legislation is necessary.

18. Under **Tranche 1** present status of Environment, forest and other clearances are mentioned below.

**Table 5: Status of Compliance with National and State Legal Requirements (upto 31<sup>st</sup> May 2017)**

Package	Main package work	National and State Legal Requirement	Status	Conditions of the Clearance/NOCs
KEIP/ICB/ Tr-1/WS02/2013-14	Rehabilitation and Refurbishment of Water Works at Palta and Garden Reach	Water (Prevention and Control of Pollution) Act. 1974  Consent to Establish (CTE) for rehabilitation of WTP from West Bengal Pollution Control Board  Consent to operate (CTO) will be required before operation  Forest (Conservation) Act 1980; West Bengal Trees and (Protection and	Online application has been submitted to WBPCB on 30 <sup>th</sup> June 2015 for CTE for Rehabilitation of Water Treatment Plant at Palta Water Works. <b>CTE received on 03.09.2015,</b> which valid for 5 years  Pipeline alignment shifted as per design modification. No tree	Consent to Establish received on 03.09.2015. Copy attached as <b>Appendix 4</b> Conditions and compliance are shown below (Table 6)  Not applicable till date

Package	Main package work	National and State Legal Requirement	Status	Conditions of the Clearance/NOCs
		<p>Conservation in Non-Forest Areas) Act, 2006 for felling of trees</p> <p>The Air (Prevention and Control of Pollution) Act, 1981, as amended by Amendment Act, 1987</p> <p>Noise Pollution (Regulation and Control) Rules, 2002 amended up to 2010.</p> <p>Also for setting up hot mix plant, batching plant and use of diesel generator Consent to Establish (CTE) and Consent to Operate (CTO)</p>	<p>felling is required</p> <p>During implementation of project, compliance with Air Act , Noise Rules and Water Act will be required</p> <p>Not required now as per present work</p>	
<b>KEIIP/ICB/ Tr-1/WS &amp; SD-04/13-14</b>	Laying of water trunk main from Garden Reach waterworks to Taratala valve station and laying of sewer line along Diamond Harbour Road by Micro tunneling method	<p>West Bengal Trees (Protection and Conservation in Non-Forest Areas) Act, 2006- Tree felling permission</p> <p>Water (Prevention and Control of Pollution) Act. 1974</p> <p>The Air (Prevention and Control of Pollution) Act, 1981, as amended by Amendment Act, 1987</p> <p>Also for setting up diesel generator Consent to Establish (CTE) and Consent to Operate (CTO)</p>	<p>Tree felling- Permission obtained from Divisional Forest Officer, Forest Utilization Division, Govt. of West Bengal at Kolkata (Ref letter 655/17 T dated 29.09.14) – felling of 17 trees along Taratala Road for laying of water main. Compensatory afforestation of 75 trees is recommended in clearance certificate.</p> <p>During implementation of project compliance against Air Act , Noise Rules and Water Act will be required</p> <p>Not required for acoustic type of Generator</p>	Tree felling has been done Compensatory afforestation at non forest land- Action has already been initiated
<b>KEIIP/ICB/ Tr-1/SD-05/13-14</b>	Construction of pumping stations in Begore khal and in Joka Tram Depot and Construction of	<p>Water (Prevention and Control of Pollution) Act. 1974</p> <p>The Air (Prevention</p>	During implementation of project compliance with Air Act , Noise Rules and Water Act will be required	-

Package	Main package work	National and State Legal Requirement	Status	Conditions of the Clearance/NOCs
	Sewerage and Drainage Network within Diamond Harbour Road catchment	and Control of Pollution) Act, 1981, as amended by Amendment Act, 1987  Noise Pollution (Regulation and Control) Rules, 2002 amended up to 2010  Also for setting up diesel generator Consent to Establish (CTE) and Consent to Operate (CTO)	Not required now For acoustic type of Generator- not required	
<b>KEIIP/ICB/ Tr-1/SD-07/15-16</b>	Construction of S & D Network and Pumping Station in Borough XIII (Ward 122) including Replacement of GAP Sewer Line in Borough XV, Laying of Pumping Main and Rehabilitation of SSE STP including Operation & Maintenance of the Pumping Stations(s) and STP	Water (Prevention and Control of Pollution) Act. 1974  The Air (Prevention and Control of Pollution) Act, 1981, as amended by Amendment Act, 1987  Noise Pollution (Regulation and Control) Rules, 2002 amended up to 2010	During implementation of project compliance against Air Act , Noise Rules and Water Act will be required	-

**Table 6: Compliance of Consent to Establish (CTE) Water Treatment Plant under Palta Water Works**

Sl. No.	Conditions	Compliances
1	The quality of sewage and trade effluent to be discharged from your factory shall satisfy the permissible limits as prescribed in IS:2490 (Pt.) of 1974, and/or its subsequent amendment and Environment (Protection) Rules 1986.	During operation of WTP sewage will be discharged after conforming permissible limit (IS:2490)
2	Suitable measures to treat your effluent shall be adopted by you in order to reduce the pollution load so that the quality of the effluent satisfies the standards mentioned above.	Effluent will be treated before discharge to reduce pollution load
3	You shall have to apply to this Board for its consent to operate and discharge of sewage and trade effluent according to the provisions of the water (Prevention & control of Pollution) Act, 1974. No sewage or trade effluent shall be discharged by you without prior consent of this Board.	Consent to Operate will be taken from Pollution Control Board before commissioning of WTP. No sewage will be discharged without prior consent of the Board.
4	All emission from your factory shall conform to the standards as laid down by this Board.	No air emission expected from WTP
5	No emission shall be permitted without prior approval of this Board and you shall apply to this	No emission expected from WTP

Sl. No.	Conditions	Compliances
	Board for its consent to operate and atmospheric emission as per provision of the Air (Prevention & control Pollution) Act, 1981.	
6	You shall comply with	
(i)	Water (Prevention and Control of Pollution Cess Act, 1977, if applicable.	Under compliance during construction and will be complied (relevant Rules & Regulation) during operation Public Liability Insurance for the entire water treatment plant has been taken from National Insurance Company.
(ii)	Water (Prevention and Control of Pollution) Cess Act, 1978, if applicable.	
(iii)	Environment (Protection ) Act, 1986	
(iv)	Environment (Protection) Rules, 1986	
(v)	Hazardous Wastes (Management and Handling) Rules, 1989 and Amended Rules, 2000	
(vi)	Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 and Amended Rules, 2000.	
(vii)	Manufacture, Use, Import and Storage and Hazardous Micro-Organisms, Genetically Engineered Organisms or Cell Rules, 1989.	
(viii)	The Public Liability Insurance Act, 1991 and Amended Act, 1992.	
(ix)	The Public Liability Insurance Rules, 1991 and Amended Rules 1993.	
(x)	Biomedical Wastes (Management & Handling) Rules, 1998 and Amended rules 2000, if applicable.	
(xi)	Recycled Plastics Manufacture and Usage rules 1999, if applicable and	
(xii)	Ozone Depleting Substances (Regulation & Control) Rules, 2000, if applicable.	
7	You will have to abide by any other stipulations as may be prescribed by any authority/local bodies/Government Departments, etc.	Will abide by any other stipulations as may be prescribed by any authority/local bodies/Government Departments, etc
<b>Special conditions</b>		
1	Water shall be sourced from the Hooghly River.	Presently water sourced from river Hooghly
2	The surface water treatment system shall consist of flash Mixing, flocculation, inclined plate settling rapid sand filtration. Chlorination & sludge handing system.	The surface water treatment system will consist of flash Mixing, flocculation, inclined plate settling rapid sand filtration. Chlorination & sludge handing system.
3	All sorts of precaution should be taken as per statutory rules for handling and storage of chlorine. Explosive license should be obtained from appropriate authorities for handling and storage of Chlorine.	All sorts of precaution would be taken as per statutory rules for handling and storage of chlorine. Explosive license already exists for running plant.
4	No additional machinery/equipment can be installed without prior permission from WBPCB. No change in raw materials, products, production capacity and manufacturing process shall be made without prior permission from the Board.	No additional machinery/equipment will be installed without prior permission from WBPCB. No change in raw materials, products, production capacity and manufacturing process will be made without prior permission from the Board.
5	Noise Control – Ambient noise level not to exceed the permissible limit.	During construction and operation phase noise mitigation measures will be applied
6	Work shall be done under covered shed for noise reduction.	It will be maintained as per site condition

Sl. No.	Conditions	Compliances
7	Good housekeeping to be maintained.	Satisfactory housekeeping already maintained
8	Free planting, sapling along the periphery of the unit.	Plantation will be done after completion of construction activity
9	Land Conversion Certificate to be obtained	Proposed site within existing premises of Palta water works
10	Consent for Operate to be obtained from the State Board before commissioning of the unit.	Consent for Operate will be obtained from the State Board before commissioning of the new treatment unit.
11	Provision of drinking water & waste water disposal shall be ensured for labour camps. Proper sanitation facilities shall be provided for construction workers to ensure environmental sanitation, health and safety of the workers shall be ensured during construction.	Drinking water and toilet facility are available at labour camp. Waste water discharges as per site condition. Also health and safety of the workers maintained during construction. Health check up camp has been arranged.
12	The project proponent shall take necessary care not to cause any inconvenience to the residents or surrounding neighbourhood. Regular supervision shall be in place all through the construction phase so as to avoid disturbance to the surrounding.	Project location within Palta Water Works campus no impact is expected on resident movement
13	The Project Proponent will ensure that no accumulation of any kind of water occurs within the project area to prevent breeding of various diseases spreading vectors.	The Project Proponent would ensure that no accumulation of any kind of water occurs within the project area to prevent breeding of various diseases spreading vectors.
14	Ground water shall not be abstracted without prior permission of the Local Body as well as the Competent Authority as per the West Bengal Ground Water Resources (Management Control and Regulation) Act, 2005.	There is no need for groundwater abstraction, as per plan only surface (river) water will be utilized Presently for drinking purpose supplied water are used
15	The unit shall be abide by the West Bengal Trees (Prevention and Conservation in Non-Forest Area) Rules, 2007. Adequate green belt shall be developed.	The unit will abide by the West Bengal Trees (Prevention and Conservation in Non-Forest Area) Rules, 2007. Adequate green belt will be developed after completion of the construction activity.
16	No tree can be felled without prior permission from the Tree Cutting Authority constituted as per the West Bengal Tree (Prevention and Conservation in Non-Forest Area) Act, 2006 and subsequent rules.	No tree will be felled without prior permission from the Tree Cutting Authority constituted as per the West Bengal Tree (Prevention and Conservation in Non-Forest Area) Act, 2006 and subsequent rules.

#### IV. COMPLIANCE STATUS WITH THE ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

19. There are 6 environment sensitive subprojects under implementation. Site Environment plan including site specific EMP was submitted by the contractor before starting of each construction packages. These EMPs are generally revised semi annually as per progress of construction work. **Appendix 5** shows sample Site Specific EMP.

20. Preliminary survey work is continued for package “Performance Based Water Loss Management Works at Cossipore Service Zone, Ward no. 01 to 06 (KEIIP/ICB/Tr-1/WS01/2015-16)”. EMP monitoring will be started shortly for this package. Workman compensation insurance has already been arranged and copies of the relevant certificates are included in **Appendix 8**.

21. Environment Specialist from DSC and PMU carried out periodic monitoring of EMP implementation through desk review of contractor’s records and site inspections. Package

wise findings are presented in **Tables 7 to 11**. It may be noted, though most of the sites are environmentally well managed, in a few cases in packages like **KEIIP/ICB/Tr-1/SD-05/13-14**, **KEIIP/ICB/Tr-1/SD-07/2015-16** and **KEIIP/NCB/TR-1/BR-08A/2015-16** there were scope for further improvement in site management measures as mentioned below,

- Improvement of housekeeping, access to working area including pumping station sites (SD-05)
- Arrangement of sufficient number of work display board and repairing/replacement of old board (SD-05)
- Complete use of PPE, particularly use of working shoes, gumboots (SD-05)
- Further improvement in respect of house-keeping and provision of basic facilities (like bed) to labourers in the construction camp site of the SSE STP (SD-07)
- Complete use of PPE, particularly use of working shoes, gumboots, etc (SD-07)
- Control of dust at working site within interior construction area (BR-08A)

22. The concerned contractors were instructed verbally and also in writing. During subsequent field visits and from monthly monitoring reports it was observed that such deficiencies are mostly removed and site management has considerably improved.

**Table 7: Compliance to EMP for the Package - Rehabilitation and Refurbishment of Water Works at Palta and Garden Reach  
(KEIIP/ICB/ Tr-1/WS02/2013-14)**

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
<b>Pre Construction - Design phase</b>									
1	Site clearance	Site preparation work including necessary clearance and permission	<ul style="list-style-type: none"> <li>Tree felling requirement – site environment plan</li> <li>NOC – paper documents from line agency</li> </ul>	All Project locations	DSC/PMU	Observation and document checking	Environment Specialist of DSC and PMU	Before commencement of final design	Complied Tree felling not required. Design of pipeline alignment modified
2	Access to Site	<ul style="list-style-type: none"> <li>Access to site will be via existing roads</li> <li>Involvement of local Traffic Department in the planning stages of the road closure and detour and available on site in the monitoring of traffic in the early stages of the operations during road closure</li> </ul>	<ul style="list-style-type: none"> <li>Involvement of traffic dept.</li> <li>Road closure planning</li> </ul>	Specific project location	DSC/PMU	Site observation	Environment Specialist of DSC and PMU	Do	Complied Site is easily accessible – working location within the Water Treatment Plan premises and near existing jetty
3	Affected utilities	Shifting of affected utilities like electric and telephone poles, pipe lines	<ul style="list-style-type: none"> <li>List of affected utilities if any and operators</li> <li>Bid document to include requirement for a contingency plan for service interruptions</li> </ul>	Specific project location	DSC/PMU	Observation and document checking	Environment Specialist of DSC and PMU	Do	Not required as per nature of work
4	Water supply	Health risk due to closure of water supply	<ul style="list-style-type: none"> <li>Schedule of closure</li> <li>Delivery of KMC of potable water to affected people</li> </ul>	-	DSC/PMU	Checking of records Visual observation	Environment Specialist of DSC and PMU	Do	Not required as per present nature of work
5	Traffic Management	Planning for Traffic Management	Ensure traffic management plan is part of contract documents and being	-	DSC/PMU	Observation and document checking	Environment Specialist of DSC and PMU	Do	Not required as per present nature of work Working location

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
			implemented						within the Water Treatment Plan premises
6	Construction work camps (if needed), hot mix plants, stockpile areas, storage areas, and disposal areas.	<ul style="list-style-type: none"> <li>• Planning for setting up worker camps, hot mix plant, stockpile area, storage and disposal areas</li> <li>• Prioritize areas within or nearest possible vacant space in the subproject location</li> <li>• Non use of residential area</li> <li>• Arrangement of toilet and drinking water facility</li> <li>• No disposal of waste in water</li> </ul>	List of selected location for construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas	Camp and other sites	DSC/PMU	Observation and document checking	Environment Specialist of DSC and PMU	Before start of physical work & Continuous	Complied Labour camp constructed as per specification. Water supply and drainage of waste water arranged
7	Establishing Equipment Lay-down and Storage Area <sup>1</sup>	<ul style="list-style-type: none"> <li>• Choice of location for equipment lay-down and storage areas must take into account prevailing winds, distances to adjacent land uses, general on-site topography and water erosion potential of the soil.</li> <li>• Storage areas shall be secure so as to minimize the risk of crime.</li> <li>• Away from school and direct residential areas</li> <li>• Fire prevention facilities must be present at all</li> </ul>	List of selected location and facility	Proposed locations considered in the package	DSC/PMU	Site visit and checking	Environment Specialist of DSC and PMU	Before start of physical work & Continuous	Complied Storage area inside. Proper storage of fuels, lubricants done. Equipment lay-down area demarcated with signage board

<sup>1</sup> Storage areas can be hazardous, unsightly and can cause environmental pollution if not designed and managed carefully

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		storage facilities <ul style="list-style-type: none"> <li>• Proper storage facilities for the storage of oils, paints, grease, fuels, chemicals and any hazardous materials</li> <li>• These storage facilities (including any tanks) must be on an impermeable surface</li> <li>• Staff must be aware of their potential impacts and follow the appropriate safety measures</li> </ul>							
8	Education of site staff on general and Environmental Conduct <sup>2</sup>	<ul style="list-style-type: none"> <li>• Ensure that all site personnel have a basic level of environmental awareness training</li> <li>• All employees must undergo safety training and wear the necessary protective clothing</li> </ul>	Documentation – Training and awareness	-	DSC/PMU	Materials and records on awareness training program	Environment Specialist of DSC and PMU	-	Site Safety training continued for worker and recorded properly. Sample training document attached as <b>Appendix 15</b>
<b>Construction</b>									
9	Materials Management – Sourcing <sup>3</sup>	<ul style="list-style-type: none"> <li>• Contractors shall prepare a source statement indicating the sources of all materials (including topsoil, sands, natural gravels, crushed stone, asphalt, clay liners etc), and submit these to the DSC for approval prior to commencement of any work.</li> <li>• Use of Govt. approved</li> </ul>	<ul style="list-style-type: none"> <li>• List of approved quarry sites and sources of materials</li> <li>• Bid document to include requirement for verification of suitability of sources and permit for additional quarry</li> </ul>	Quarries and material source areas	Contractor	<ul style="list-style-type: none"> <li>• Checking of records</li> <li>• Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Daily visit by construction supervisor of DSC. Weekly visit by Construction Manager, Visit by Environment Specialist and Junior Environmental Scientist on	Complied Approval obtained from PMU and DSC. Procurement continued

<sup>2</sup> These points need to be made clear to all staff on site before the subproject begin.

<sup>3</sup> Materials must be sourced in a legal and sustainable way to prevent offsite environmental degradation.

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		<ul style="list-style-type: none"> <li>quarry sites for procurement of materials</li> <li>Verify suitability of all material sources and obtain approval of Investment from PMU/DSC</li> </ul>	<ul style="list-style-type: none"> <li>sites if necessary.</li> <li>Construction Contractor documentation</li> </ul>					21.02.2017 19.04.2017	
10	Maintenance of Construction Camp	<ul style="list-style-type: none"> <li>Establishment of temporary camps with drinking water, sanitary and solid waste management arrangement</li> <li>Train employees in the storage and handling of materials</li> <li>Remove all wreckage, rubbish, or temporary structures</li> </ul>	<ul style="list-style-type: none"> <li>Complaints from sensitive Receptors</li> <li>Water and sanitation facilities for employees</li> <li>Housekeeping – regular disposal of solid waste</li> </ul>	Camp site	Contractor	<ul style="list-style-type: none"> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Complied mostly. Established within Palta Water Treatment Plant campus. Drinking water and toilet facility available. Housekeeping maintained. Drainage of waste water/ rain water from camp improved during the report period. Camp site photo attached as <b>Appendix 3</b>
11	Landscape and Aesthetics	<ul style="list-style-type: none"> <li>Removal of overburden and excavated material from working site and use / preservation of the same – as per mitigation measures</li> <li>Fencing of storage areas</li> <li>Disposal of construction debris if any as per mitigation measures</li> <li>Prepare and implement Waste Management List</li> <li>Avoid stockpiling of excess excavated soils</li> <li>Coordinate with KMC for</li> </ul>	<ul style="list-style-type: none"> <li>Waste Management List</li> <li>Complaints from sensitive receptors</li> <li>PMU/PIU/DSC to report in writing that the necessary environmental restoration work has been done</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Complied Utilization of excess earth done. Demolition waste utilized for land development Material storage at proper place continued Spoil management plan applied as per EMP

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		beneficial uses of excess excavated soils							
12	Dust and Air Pollution <sup>4</sup>	<ul style="list-style-type: none"> <li>• Selection of materials storage area</li> <li>• Water sprinkling at construction site for arresting dust (if any during dry period)</li> <li>• Use tarpaulins to cover sand and other loose material- Reducing dust hazard</li> <li>• All vehicles and equipments mobilized to construction site and producing emission, have Pollution Under Control certification</li> <li>• No fire wood burning is allowed on site</li> <li>• Carry out air quality monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• Location of stockpiles</li> <li>• Complaints from sensitive receptors</li> <li>• Monitoring data</li> <li>• Heavy equipment and machinery with air pollution control</li> <li>• Water sprinkling arrangement</li> <li>• Cover materials</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>• Checking of records</li> <li>• Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Complied Location of stockpiles selected. Covering of materials done partially. During construction of road water sprinkling done as per requirement. During construction air quality monitoring done as per EMP. (Complete result certificates available in DSC office as back up paper). Pollution under Control Certificate of vehicles and equipments collected

<sup>4</sup> Main causes of air pollution during construction are dust from vehicle movements and stockpiles, vehicle emissions and fires.

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
13	Noise level	<ul style="list-style-type: none"> <li>Noise producing work needs to be conducted at day time</li> <li>Regular maintenance of noise producing equipment</li> <li>Horns not be used unless it is necessary to warn other road users</li> <li>Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at a distance of 10 m or more from the vehicle/s</li> <li>At sensitive locations, enclosures provided around generator set or other noise producing machinery.</li> </ul>	<ul style="list-style-type: none"> <li>Complaints from sensitive receptors</li> <li>Use of silencers in noise-producing equipment and sound barriers</li> <li>Monitoring data</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Complied No such noise producing machinery mobilized at site. PPE utilized as per requirement. During construction monitoring done. (Complete result certificates available in DSC office as back up paper).
14	Storm water management	Arrangement of drainage of waste water and arresting of solid waste/silt from waste water generated at construction site	<ul style="list-style-type: none"> <li>Areas for stockpiles, storage of fuels and lubricants and waste materials</li> <li>Number of silt traps installed along drainages (in slope) leading to water bodies</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Complied Drainage of waste water from construction site is done. Improvement is noted
15	Water Quality <sup>5</sup>	<ul style="list-style-type: none"> <li>Contractor to ensure run-off from vehicle or plant washing does not enter Hooghly river</li> </ul>	Non entry of pollutant in water body	Project Locations	Contractor	Site observation	Environment Specialist of DSC and PMU	Do	Complied during construction of Jetty. During the said

<sup>5</sup> Water quality is affected by the incorrect handling of substances and materials. Soil erosion and sediment is also detrimental to water quality. Mismanagement of polluted run-off from vehicle and plant washing and wind dispersal of dry materials into rivers and watercourses are detrimental to water quality.

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		<ul style="list-style-type: none"> <li>Contractor to ensure every effort is made that any chemicals or hazardous substances do not contaminate the soil, Hooghly river, or groundwater on site.</li> </ul>							report period no as such work done at Palta Jetty area and hence river water quality monitoring not done. But at Garden reach work just started and monitoring results include in <b>Table 14</b> (Complete result certificates available in DSC office as back up paper).
16	Conservation of Natural Environment	<ul style="list-style-type: none"> <li>Contractor to ensure removal of only trees that have been marked beforehand</li> <li>Contractor to immediately re-vegetate stripped areas</li> <li>Contractor to prohibit site staff from gathering firewood, fruits, plants, crops or any other natural material on-site or in areas adjacent to the sites.</li> </ul>	Tree felling requirement and afforestation after final design	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	To be complied if tree felling required.
17	Materials Management	<ul style="list-style-type: none"> <li>Contractor to ensure stockpiles do not obstruct natural water pathways.</li> <li>Contractor to cover stockpiles exposed to windy conditions or heavy rain with vegetation, cloth, or tarps.</li> <li>Contractor to ensure all concrete mixing take</li> </ul>	Stockpile management	Stockpile / storage area	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Complied Stockpiling of materials done at designated areas

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		place on a designated, impermeable surface.							
18	Occupational Health & safety	<ul style="list-style-type: none"> <li>Develop and implement site-specific Health and Safety (H&amp;S) Plan</li> <li>Use Personal Protective Equipment like helmet, gumboot, gloves, nose mask and earplugs</li> <li>H&amp;S Training for all site personnel</li> <li>Documentation of work-related accidents;</li> <li>Designate a safeguard focal person and undertake safeguards orientation by PMU/PIU</li> <li>Provide specific guidance for suitable PPE for every on-site work assignment</li> <li>Ensure availability of First aid box at all working sites and labour camp</li> <li>Provide medical insurance coverage for workers;</li> <li>Provide supplies of potable drinking water at working sites;</li> <li>Provide H&amp;S orientation training to all new workers</li> <li>Mark and provide sign boards for hazardous areas such as energized electrical devices and lines</li> <li>Disallow worker exposure to noise level greater than 85 dBA for a duration of</li> </ul>	<ul style="list-style-type: none"> <li>Site-specific Health and Safety (H&amp;S) Plan</li> <li>Equipped first-aid stations;</li> <li>Medical insurance coverage for workers</li> <li>Number of accidents</li> <li>Supplies of potable drinking water;</li> <li>Record of H&amp;S orientation trainings</li> <li>Personal protective equipments</li> <li>Sign boards for hazardous areas such as energized electrical devices and lines, service rooms</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	<p>Site-specific Health and Safety (H&amp;S) Plan under implementation Sample Attached as <b>Appendix 7</b>.</p> <p>H &amp; S training arranged for the labourer on regular basis.</p> <p>Drinking water and first aid box available at site.</p> <p>Insurance arranged for the labourer. Attached as <b>Appendix 8</b></p> <p>Sample copy of minor accident(first aid case) as reported during report period is enclosed herewith (<b>Appendix 10</b>)</p> <p>Tie up letter with nearby health center in case of emergency attached as <b>Appendix 9</b>.</p> <p>Overall compliance</p>

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		more than 8 hours per day without hearing protection.							is satisfactory
19	Social Impacts <sup>6</sup> - Community Health & safety, accessibility	<ul style="list-style-type: none"> <li>Plan truck routes (for carrying construction materials including pipes) to avoid narrow or congested roads and tourist sites</li> <li>Contractor to ensure disruption of access for local residents is minimized</li> <li>Contractor to restrict activities and movement of staff to designated construction areas</li> <li>Contractor to provide walkways and metal sheets where required to maintain access across for people and vehicles</li> <li>Consideration of public safety - as per prescribed mitigation measures</li> <li>Contractors to ensure lighting on the construction site</li> <li>Provide protective fencing around open trenches</li> <li>Provide road signs and flag persons to warn</li> <li>Schedule transport and hauling activities during non- peak hours</li> </ul>	<ul style="list-style-type: none"> <li>Traffic Management Strategy</li> <li>Complaints from sensitive receptors</li> <li>Number of signages placed at subproject location</li> </ul>	Project Locations	Contractor	Document check and visual observation	Environment Specialist of DSC and PMU	Do	<p>Complied Caution tape placed around excavated and working area as and when required;</p> <p>Working area inside WTP campus and presently no permanent barricade required</p>
20	Socio cultural	<ul style="list-style-type: none"> <li>Strictly follow the protocol</li> </ul>	Chance find protocol	Project	Contractor	Checking of	Environment	Do	Not required till

<sup>6</sup> Regular communication between the Contractor and the interested and affected parties is important for the duration of the contract.

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
	resources	for chance archaeological finds in any excavation work <ul style="list-style-type: none"> <li>Stop work immediately to allow further investigation if any finds are suspected</li> </ul>		Locations		records	Specialist of DSC and PMU		date Instruction has been given
21	Employment generation	<ul style="list-style-type: none"> <li>The use of labor intensive construction measures will be used where appropriate</li> <li>Employ local (unskilled) labor if possible</li> <li>Training of labor to benefit individuals beyond completion of the subproject</li> </ul>	Employment record	Project Locations	Contractor	Checking of records	Environment Specialist of DSC and PMU	Do	At present local labourers are mostly engaged. List of laborers are attached as <b>Appendix 11</b>

**Table 8: Compliance to EMP of for the Package - Laying of water trunk main from Garden Reach waterworks to Taratala valve station and laying of sewer line along Diamond Harbour Road by Micro tunneling method (KEIIP/ICB/ Tr-1/WS & SD-04/13-14)**

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
<b>Pre Construction - Design phase</b>									
1	Site clearance	Site preparation work including necessary clearance and permission	<ul style="list-style-type: none"> <li>Tree felling requirement – site environment plan</li> <li>NOC – paper documents from line agency</li> </ul>	All Project locations	DSC/PMU	Observation and document checking	Environment Specialist of DSC and PMU	Before commencement of final design	Permission obtained for felling of 17 trees along Taratala Road for laying of water main. Compensatory afforestation of 75 trees is recommended in NOC. Tree felling and compensatory afforestation

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
									done
2	Access to Site	<ul style="list-style-type: none"> <li>Access to site will be via existing roads</li> <li>Involvement of local Traffic Department in the planning stages of the road closure and detour and available on site in the monitoring of traffic in the early stages of the operations during road closure</li> </ul>	<ul style="list-style-type: none"> <li>Involvement of traffic dept.</li> <li>Road closure planning</li> </ul>	Specific project location	DSC/PMU	Site observation	Environment Specialist of DSC and PMU	Do	Complied During laying of pipes, road closed near shaft location. Diversion of traffic at closed part – done. Access to site maintained after due consultation with traffic dept. Traffic management plan submitted ( <b>Appendix 12</b> )
3	Affected utilities	Shifting of affected utilities like electric and telephone poles, pipe lines	<ul style="list-style-type: none"> <li>List of affected utilities if any and operators</li> <li>Bid document to include requirement for a contingency plan for service interruptions</li> </ul>	Specific project location	DSC/PMU	Observation and document checking	Environment Specialist of DSC and PMU	Do	Complied as per requirement. Consultation with utility dept. carried out as per requirement and in case of damage of utility
4	Water supply	Health risk due to closure of water supply	<ul style="list-style-type: none"> <li>Schedule of closure</li> <li>Delivery of KMC of potable water to affected people</li> </ul>	-	DSC/PMU	Checking of records Visual observation	Environment Specialist of DSC and PMU	Do	Not required now as per present nature of work
5	Traffic Management	Planning for Traffic Management	Ensure traffic management plan is part of contract documents and being implemented	-	DSC/PMU	Observation and document checking	Environment Specialist of DSC and PMU	Do	Complied Traffic management plan prepared and approved from traffic /

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
									police dept. Appendix 12 shows traffic management plan
6	Construction work camps (if needed), hot mix plants, stockpile areas, storage areas, and disposal areas.	<ul style="list-style-type: none"> <li>• Planning for setting up worker camps, hot mix plant, stockpile area, storage and disposal areas</li> <li>• Prioritize areas within or nearest possible vacant space in the subproject location</li> <li>• Non use of residential area</li> <li>• Arrangement of toilet and drinking water facility</li> <li>• No disposal of waste in water</li> </ul>	List of selected location for construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas	Camp and other sites	DSC/PMU	Observation and document checking	Environment Specialist of DSC and PMU	Before start of physical work & Continuous	Complied Rented house has been selected as labour camp.
7	Establishing Equipment Lay-down and Storage Area <sup>7</sup>	<ul style="list-style-type: none"> <li>• Choice of location for equipment lay-down and storage areas must take into account prevailing winds, distances to adjacent land uses, general on – site topography and water erosion potential of the soil.</li> <li>• Storage areas shall be secure so as to minimize the risk of crime.</li> <li>• Away from school and</li> </ul>	List of selected location and facility	Proposed locations considered in the package	DSC/PMU	Site visit and checking	Environment Specialist of DSC and PMU	Before start of physical work & Continuous	Complied Proper storage of fuels, lubricants done. Equipment lay-down area demarcated

<sup>7</sup> Storage areas can be hazardous, unsightly and can cause environmental pollution if not designed and managed carefully

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		direct residential areas <ul style="list-style-type: none"> <li>• Fire prevention facilities must be present at all storage facilities</li> <li>• Proper storage facilities for the storage of oils, paints, grease, fuels, chemicals and any hazardous materials</li> <li>• These storage facilities (including any tanks) must be on an impermeable surface</li> <li>• Staff must be aware of their potential impacts and follow the appropriate safety measures</li> </ul>							
8	Education of site staff on general and Environmental Conduct <sup>8</sup>	<ul style="list-style-type: none"> <li>• Ensure that all site personnel have a basic level of environmental awareness training</li> <li>• All employees must undergo safety training and wear the necessary protective clothing</li> </ul>	Documentation – Training and awareness	-	DSC/PMU	Materials and records on awareness training program	Environment Specialist of DSC and PMU	-	Site Safety training arranged regularly. Awareness program arranged regularly and recorded. Sample training document attached as <b>Appendix 15</b>
<b>Construction</b>									
9	Materials Management – Sourcing <sup>9</sup>	<ul style="list-style-type: none"> <li>• Contractors shall prepare a source statement indicating the sources of all materials</li> </ul>	<ul style="list-style-type: none"> <li>• List of approved quarry sites and sources of materials</li> </ul>	Quarries and material source areas	Contractor	<ul style="list-style-type: none"> <li>• Checking of records</li> <li>• Visual inspection</li> </ul>	Environment Specialist of DSC and PMU	Daily visit by construction supervisor of DSC. Weekly	Complied Approval obtained from PMU and DSC

<sup>8</sup> These points need to be made clear to all staff on site before the subproject begin.

<sup>9</sup> Materials must be sourced in a legal and sustainable way to prevent offsite environmental degradation.

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		<p>(including topsoil, sands, natural gravels, crushed stone, asphalt, clay liners etc), and submit these to the DSC for approval prior to commencement of any work.</p> <ul style="list-style-type: none"> <li>• Use of Govt. approved quarry sites for procurement of materials</li> <li>• Verify suitability of all material sources and obtain approval of Investment from PMU/DSC</li> </ul>	<ul style="list-style-type: none"> <li>• Bid document to include requirement for verification of suitability of sources and permit for additional quarry sites if necessary.</li> <li>• Construction Contractor documentation</li> </ul>			of sites		<p>visit by Construction Manager, Visit by Environment Specialist and Junior Environmental Scientist on</p> <p>28.12.2016 04.01.2017 17.01.2017 16.02.2017 06.03.2017 13.05.2017</p>	as per requirement
10	Maintenance of Construction Camp	<ul style="list-style-type: none"> <li>• Establishment of temporary camps with drinking water, sanitary and solid waste management arrangement</li> <li>• Train employees in the storage and handling of materials</li> <li>• Remove all wreckage, rubbish, or temporary structures</li> </ul>	<ul style="list-style-type: none"> <li>• Complaints from sensitive Receptors</li> <li>• Water and sanitation facilities for employees</li> <li>• Housekeeping – regular disposal of solid waste</li> </ul>	Camp site	Contractor	<ul style="list-style-type: none"> <li>• Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Complied Established within rented house.
11	Landscape and Aesthetics	<ul style="list-style-type: none"> <li>• Removal of overburden and excavated material from working site and use / preservation of the same – as per mitigation measures</li> <li>• Fencing of storage areas</li> <li>• Disposal of construction debris if any as per</li> </ul>	<ul style="list-style-type: none"> <li>• Waste Management List</li> <li>• Complaints from sensitive receptors</li> <li>• PMU/PIU/DSC to report in writing that the necessary environmental restoration work has been done</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>• Checking of records</li> <li>• Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Complied Excess earth and slurry disposed at designated/ approved location Spoil management plan applied as

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		<ul style="list-style-type: none"> <li>mitigation measures</li> <li>Prepare and implement Waste Management List</li> <li>Avoid stockpiling of excess excavated soils</li> <li>Coordinate with KMC for beneficial uses of excess excavated soils</li> </ul>							per EMP (Attached as <b>Appendix 6</b> ) Site photo attached as <b>Appendix 3</b> .
12	Dust and Air Pollution <sup>10</sup>	<ul style="list-style-type: none"> <li>Selection of materials storage area</li> <li>Water sprinkling at construction site for arresting dust (if any during dry period)</li> <li>Use tarpaulins to cover sand and other loose material- Reducing dust hazard</li> <li>All vehicles and equipments mobilized to construction site and producing emission, have Pollution Control Board certification</li> <li>No fires are allowed on site</li> <li>Carry out air quality monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Location of stockpiles</li> <li>Complaints from sensitive receptors</li> <li>Monitoring data</li> <li>Heavy equipment and machinery with air pollution control</li> <li>Water sprinkling arrangement</li> <li>Cover materials</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Complied Location of stockpiles selected. Covering of materials considered for storage Water sprinkling done as per requirement During construction air quality monitoring done as per EMP. (Complete Result certificates available in DSC office as back up paper). Pollution under Control Certificate of vehicles and equipment obtained

<sup>10</sup> Main causes of air pollution during construction are dust from vehicle movements and stockpiles, vehicle emissions and fires.

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
13	Noise level	<ul style="list-style-type: none"> <li>Noise producing work needs to be conducted at day time</li> <li>Regular maintenance of noise producing equipment</li> <li>Require horns not be used unless it is necessary to warn other road users</li> <li>Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at a distance of 10 m or more from the vehicle/s</li> <li>At sensitive locations enclosures provided around generator set or other noise producing machinery.</li> </ul>	<ul style="list-style-type: none"> <li>Complaints from sensitive receptors</li> <li>Use of silencers in noise-producing equipment and sound barriers</li> <li>Monitoring data</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Complied No as such noise generating problem near the project location. PPE utilized by labourers as per requirement. During construction monitoring was done. Monitoring will be continued as per EMP. (Complete Result certificates available in DSC office as back up paper).
14	Storm water management	Arrangement of drainage of waste water and arresting solid waste/silt from waste water generated at construction site	<ul style="list-style-type: none"> <li>Areas for stockpiles, storage of fuels and lubricants and waste materials</li> <li>Number of silt traps installed along drainages (in slope) leading to water bodies</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Complied Arrangement of drainage of waste water from construction locations done

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
15	Water Quality <sup>11</sup>	<ul style="list-style-type: none"> <li>Contractor to ensure run-off from vehicle or plant washing does not enter Hooghly river</li> <li>Contractor to ensure every effort is made that any chemicals or hazardous substances do not contaminate the soil, Hooghly river, or groundwater on site.</li> </ul>	Non entry of pollutant in water body	Project Locations	Contractor	Site observation	Environment Specialist of DSC and PMU	Do	No water source near the construction location
16	Conservation of Natural Environment	<ul style="list-style-type: none"> <li>Contractor to ensure only trees that have been marked beforehand are to be removed</li> <li>Contractor to immediately re-vegetate stripped areas</li> <li>Contractor to prohibit site staff from gathering firewood, fruits, plants, crops or any other natural material on-site or in areas adjacent to the sites.</li> </ul>	Tree felling requirement and afforestation after final design	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	15 nos. of tree felling done and compensatory plantation completed with 75 trees
17	Materials Management	<ul style="list-style-type: none"> <li>Contractor to ensure stockpiles do not obstruct natural water pathways.</li> <li>Contractor to cover stockpiles exposed to windy conditions or heavy rain with</li> </ul>	Stockpile management	Stockpile / storage area	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Instruction has been given to contractor for stockpiling of materials at designated areas

<sup>11</sup> Water quality is affected by the incorrect handling of substances and materials. Soil erosion and sediment is also detrimental to water quality. Mismanagement of polluted run-off from vehicle and plant washing and wind dispersal of dry materials into rivers and watercourses are detrimental to water quality.

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		<ul style="list-style-type: none"> <li>vegetation, cloth, or tarps.</li> <li>Contractor to ensure all concrete mixing take place on a designated, impermeable surface.</li> </ul>							
18	Occupational Health & safety	<ul style="list-style-type: none"> <li>Develop and implement site-specific Health and Safety (H&amp;S) Plan</li> <li>Use Personal Protective Equipment like helmet, gumboot, gloves, nose mask and earplugs</li> <li>H&amp;S Training for all site personnel</li> <li>Documentation of work-related accidents;</li> <li>Designate a safeguard focal person and undertake safeguards orientation by PMU/PIU</li> <li>Provide specific guidance for suitable PPE for every on-site work assignment</li> <li>Ensure availability of First aid box at all working sites and labour camp</li> <li>Provide medical insurance coverage for workers;</li> <li>Provide supplies of potable drinking water at working sites;</li> <li>Provide H&amp;S orientation training to all new</li> </ul>	<ul style="list-style-type: none"> <li>Site-specific Health and Safety (H&amp;S) Plan</li> <li>Equipped first-aid stations;</li> <li>Medical insurance coverage for workers</li> <li>Number of accidents</li> <li>Supplies of potable drinking water;</li> <li>Record of H&amp;S orientation trainings</li> <li>Personal protective equipments</li> <li>Sign boards for hazardous areas such as energized electrical devices and lines, service rooms</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	<p>Site-specific Health and Safety (H&amp;S) Plan under implementation.</p> <p>H &amp; S training arranged for the labourer on regular basis.</p> <p>Drinking water and first aid box available at site.</p> <p>Insurance arranged for the labourer. Attached as <b>Appendix 8.</b></p> <p>Sample minor accident record (first aid) is attached as <b>Appendix 10.</b></p> <p>Tie up letter with nearby health center in case of emergency attached as</p>

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		<ul style="list-style-type: none"> <li>workers</li> <li>Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, appropriate</li> <li>Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection.</li> </ul>							<p><b>Appendix 9.</b></p> <p>Overall compliance is satisfactory</p>
19	Social Impacts <sup>12</sup> - Community Health & safety, accessibility	<ul style="list-style-type: none"> <li>Plan truck routes (for carrying construction materials including pipes) to avoid narrow or congested roads and tourist sites</li> <li>Contractor to ensure disruption of access for local residents is minimized</li> <li>Contractor to restrict activities and movement of staff to designated construction areas</li> <li>Contractor to provide walkways and metal sheets where required to maintain access across for people and vehicles</li> <li>Consideration of public</li> </ul>	<ul style="list-style-type: none"> <li>Traffic Management Strategy</li> <li>Complaints from sensitive receptors</li> <li>Number of signages placed at subproject location</li> </ul>	Project Locations	Contractor	Document check and visual observation	Environment Specialist of DSC and PMU	Do	<p>Caution tape/ barricade placed around excavated area (Ref photo <b>Appendix 3</b>)</p> <p>Permanent hard barricade arranged by the contractor with diversion signage Traffic Management Plan under implementation</p> <p>Photo attached as <b>Appendix 3.</b></p>

<sup>12</sup> Regular communication between the Contractor and the interested and affected parties is important for the duration of the contract.

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		<p>safety - as per prescribed mitigation measures</p> <ul style="list-style-type: none"> <li>Contractors to ensure lighting on the construction site</li> <li>Provide protective fencing around open trenches</li> <li>Provide road signs and flag persons to warn</li> <li>Schedule transport and hauling activities during non- peak hours</li> </ul>							
20	Socio cultural resources	<ul style="list-style-type: none"> <li>Strictly follow the protocol for chance finds in any excavation work</li> <li>Stop work immediately to allow further investigation if any finds are suspected</li> </ul>	Chance find protocol	Project Locations	Contractor	Checking of records	Environment Specialist of DSC and PMU	Do	Not required till date
21	Employment generation	<ul style="list-style-type: none"> <li>The use of labor intensive construction measures will be used where appropriate</li> <li>Employ local (unskilled) labor if possible</li> <li>Training of labor to benefit individuals beyond completion of the subproject</li> </ul>	Employment record	Project Locations	Contractor	Checking of records	Environment Specialist of DSC and PMU	Do	At present local laboures are mostly engaged. List of laborers are attached as <b>Appendix 11</b>

**Table 9: Compliance to EMP of for the Package - Construction of pumping stations in Begore khal and in Joka Tram Depot and Construction of Sewerage and Drainage Network within Diamond Harbour Road catchment (KEIIP/ICB/ Tr-1/SD-05/13-14)**

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
<b>Pre Construction - Design phase</b>									
1	Site clearance	Site preparation work including necessary clearance and permission	<ul style="list-style-type: none"> <li>Tree felling requirement – site environment plan</li> <li>NOC – paper documents from line agency</li> </ul>	All Project locations	DSC/PMU	Observation and document checking	Environment Specialist of DSC and PMU	Before commencement of final design	Tree felling not required Discussion continued with utility dept. for obtaining NOC
2	Access to Site	<ul style="list-style-type: none"> <li>Access to site will be via existing roads</li> <li>Involvement of local Traffic Department in the planning stages of the road closure and detour and available on site in the monitoring of traffic in the early stages of the operations during road closure</li> </ul>	<ul style="list-style-type: none"> <li>Involvement of traffic dept.</li> <li>Road closure planning</li> </ul>	Specific project location	DSC/PMU	Site observation	Environment Specialist of DSC and PMU	Do	<p>Complied</p> <p>During laying of pipes, road partially or fully closed near pipe laying area. Public access maintained at working areas.</p> <p>More attention is paid at narrow lanes.</p> <p>Improvement noted for access at Joka and Begore PS construction site. Still improvement is required</p>
3	Affected utilities	Shifting of affected utilities like electric and telephone poles, pipe lines	<ul style="list-style-type: none"> <li>List of affected utilities if any and operators</li> <li>Bid document to include requirement for a</li> </ul>	Specific project location	DSC/PMU	Observation and document checking	Environment Specialist of DSC and PMU	Do	Complied as per requirement. Consultation with utility dept. as and when

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
			contingency plan for service interruptions						required
4	Water supply	Health risk due to closure of water supply	<ul style="list-style-type: none"> <li>Schedule of closure</li> <li>Delivery of KMC of potable water to affected people</li> </ul>	-	DSC/PMU	Checking of records Visual observation	Environment Specialist of DSC and PMU	Do	Not required now as per present nature of work. Will be complied as and when required
5	Traffic Management	Planning for Traffic Management	Ensure traffic management plan is part of contract documents and being implemented	-	DSC/PMU	Observation and document checking	Environment Specialist of DSC and PMU	Do	Complied Traffic management plan prepared and approved as per requirement. Arrangement of diversion boards/ road closure board noted but at some location repairing of board is required. Overall improvement is recorded. Instruction given for improvement. <b>Appendix 12</b> shows traffic management plan
6	Construction work camps (if	<ul style="list-style-type: none"> <li>Planning for setting up worker camps, hot mix</li> </ul>	List of selected location for construction work	Camp and other sites	DSC/PMU	Observation and	Environment Specialist of	Before start of physical work	Complied. Rented house

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
	needed), hot mix plants, stockpile areas, storage areas, and disposal areas.	<p>plant, stockpile area, storage and disposal areas</p> <ul style="list-style-type: none"> <li>• Prioritize areas within or nearest possible vacant space in the subproject location</li> <li>• Non use of residential area</li> <li>• Arrangement of toilet and drinking water facility</li> <li>• No disposal of waste in water</li> </ul>	camps, hot mix plants, stockpile areas, storage areas, and disposal areas			document checking	DSC and PMU	& Continuous	considered for staying of labourer. Camp has been established within Joka PS campus. Sufficient drinking water, toilet facility noted. Still there is scope for improvement of housekeeping
7	Establishing Equipment Lay-down and Storage Area <sup>13</sup>	<ul style="list-style-type: none"> <li>• Choice of location for equipment lay-down and storage areas must take into account prevailing winds, distances to adjacent land uses, general on – site topography and water erosion potential of the soil.</li> <li>• Storage areas shall be secure so as to minimize the risk of crime.</li> <li>• Away from school and direct residential areas</li> <li>• Fire prevention facilities must be present at all storage facilities</li> <li>• Proper storage facilities for the storage of oils, paints, grease, fuels,</li> </ul>	List of selected location and facility	Proposed locations considered in the package	DSC/PMU	Site visit and checking	Environment Specialist of DSC and PMU	Before start of physical work & Continuous	<p>Complied</p> <p>Proper storage of fuels, lubricants done.</p> <p>Equipment lay-down area demarcated.</p> <p>Fire prevention facilities arranged near fuel store area and shifting of location of firefighting equipment is noted after necessary instruction</p>

<sup>13</sup> Storage areas can be hazardous, unsightly and can cause environmental pollution if not designed and managed carefully

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		chemicals and any hazardous materials <ul style="list-style-type: none"> <li>• These storage facilities (including any tanks) must be on an impermeable surface</li> <li>• Staff must be aware of their potential impacts and follow the appropriate safety measures</li> </ul>							
8	Education of site staff on general and Environmental Conduct <sup>14</sup>	<ul style="list-style-type: none"> <li>• Ensure that all site personnel have a basic level of environmental awareness training</li> <li>• All employees must undergo safety training and wear the necessary protective clothing</li> </ul>	Documentation – Training and awareness	-	DSC/PMU	Materials and records on awareness training program	Environment Specialist of DSC and PMU	-	Complied Awareness and toll box training program arranged for contractor. Recoding has been done after necessary instruction. Sample training document attached as <b>Appendix 15</b>
<b>Construction</b>									
9	Materials Management – Sourcing <sup>15</sup>	<ul style="list-style-type: none"> <li>• Contractors shall prepare a source statement indicating the sources of all materials (including topsoil, sands, natural gravels, crushed stone, asphalt, clay liners etc), and submit these to the DSC for approval prior to</li> </ul>	<ul style="list-style-type: none"> <li>• List of approved quarry sites and sources of materials</li> <li>• Bid document to include requirement for verification of suitability of sources and permit</li> </ul>	Quarries and material source areas	Contractor	<ul style="list-style-type: none"> <li>• Checking of records</li> <li>• Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Daily visit by construction supervisor of DSC. Weekly visit by Construction Manager, Visit by Environment Specialist and	Complied. Approval obtained from PMU and DSC.

<sup>14</sup> These points need to be made clear to all staff on site before the subproject begin.

<sup>15</sup> Materials must be sourced in a legal and sustainable way to prevent offsite environmental degradation.

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		<p>commencement of any work.</p> <ul style="list-style-type: none"> <li>Use of Govt. approved quarry sites for procurement of materials</li> <li>Verify suitability of all material sources and obtain approval of Investment from PMU/DSC</li> </ul>	<p>for additional quarry sites if necessary.</p> <ul style="list-style-type: none"> <li>Construction Contractor documentation</li> </ul>					<p>Junior Environmental Scientist on 28.12.2016 03.01.2017 11.01.2017 17.01.2017 16.02.2017 15.03.2017 01.04.2017 13.05.2017</p>	
10	Maintenance of Construction Camp	<ul style="list-style-type: none"> <li>Establishment of temporary camps with drinking water, sanitary and solid waste management arrangement</li> <li>Train employees in the storage and handling of materials</li> <li>Remove all wreckage, rubbish, or temporary structures</li> </ul>	<ul style="list-style-type: none"> <li>Complaints from sensitive Receptors</li> <li>Water and sanitation facilities for employees</li> <li>Housekeeping – regular disposal of solid waste</li> </ul>	Camp site	Contractor	<ul style="list-style-type: none"> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	<p>Partially Complied mostly. Rented house arranged for labourer. Camp has been established within Joka PS campus. Sufficient drinking water, toilet facility noted. Improvement of housekeeping noted. Still there is a scope for further improvement</p>
11	Landscape and Aesthetics	<ul style="list-style-type: none"> <li>Removal of overburden and excavated material from working site and use / preservation of the same – as per mitigation measures</li> <li>Fencing of storage areas</li> <li>Disposal of construction</li> </ul>	<ul style="list-style-type: none"> <li>Waste Management List</li> <li>Complaints from sensitive receptors</li> <li>PMU/PIU/DSC to report in writing that the necessary environmental</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	<p>Complied There is improvement on disposal of excess earth at designated/ approved location- noted</p>

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		debris if any as per mitigation measures <ul style="list-style-type: none"> <li>• Prepare and implement Waste Management List</li> <li>• Avoid stockpiling of excess excavated soils</li> <li>• Coordinate with KMC for beneficial uses of excess excavated soils</li> </ul>	restoration work has been done						Spoil management plan being applied as per EMP (Attached as <b>Appendix 6</b> )
12	Dust and Air Pollution <sup>16</sup>	<ul style="list-style-type: none"> <li>• Selection of materials storage area</li> <li>• Water sprinkling at construction site for arresting dust (if any during dry period)</li> <li>• Use tarpaulins to cover sand and other loose material- Reducing dust hazard</li> <li>• All vehicles and equipments mobilized to construction site and producing emission, have Pollution Control Board certification</li> <li>• No fires are allowed on site</li> <li>• Carry out air quality monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• Location of stockpiles</li> <li>• Complaints from sensitive receptors</li> <li>• Monitoring data</li> <li>• Heavy equipment and machinery with air pollution control</li> <li>• Water sprinkling arrangement</li> <li>• Cover materials</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>• Checking of records</li> <li>• Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Complied. Location of stockpiles selected. Covering of materials considered for storage. Water sprinkling done as per requirement but frequency needs to be increase. During construction air quality monitoring done as per EMP (Complete result certificates available in DSC office as back up paper).  Pollution under

<sup>16</sup> Main causes of air pollution during construction are dust from vehicle movements and stockpiles, vehicle emissions and fires.

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
									Control Certificate of vehicles and equipment obtained
13	Noise level	<ul style="list-style-type: none"> <li>Noise producing work needs to be conducted at day time</li> <li>Regular maintenance of noise producing equipment</li> <li>Require horns not be used unless it is necessary to warn other road users</li> <li>Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at a distance of 10 m or more from the vehicle/s</li> <li>At sensitive locations enclosures provided around generator set or other noise producing machinery.</li> </ul>	<ul style="list-style-type: none"> <li>Complaints from sensitive receptors</li> <li>Use of silencers in noise-producing equipment and sound barriers</li> <li>Monitoring data</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Complied. No such noise generating problem near the project location. PPE utilized by labourer as per requirement. During construction, monitoring done. Monitoring will be continued as per EMP. (Complete result certificates available in DSC office as back up paper).
14	Storm water management	Arrangement of drainage of waste water and arresting solid waste/silt from waste water generated at construction site	<ul style="list-style-type: none"> <li>Areas for stockpiles, storage of fuels and lubricants and waste materials</li> <li>Number of silt traps installed along drainages (in slope) leading to water bodies</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Complied Arrangement of drainage of waste water from construction locations done

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
15	Water Quality <sup>17</sup>	<ul style="list-style-type: none"> <li>Contractor to ensure run-off from vehicle or plant washing does not enter water body</li> <li>Contractor to ensure every effort is made that any chemicals or hazardous substances do not contaminate the soil, surface water body, or groundwater on site.</li> </ul>	Non entry of pollutant in water body	Project Locations	Contractor	Site observation	Environment Specialist of DSC and PMU	Do	No water source near the construction location
16	Conservation of Natural Environment	<ul style="list-style-type: none"> <li>Contractor to ensure only trees that have been marked beforehand are to be removed</li> <li>Contractor to immediately re-vegetate stripped areas</li> <li>Contractor to prohibit site staff from gathering firewood, fruits, plants, crops or any other natural material on-site or in areas adjacent to the sites.</li> </ul>	Tree felling requirement and afforestation after final design	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	No tree felling required till date
17	Materials Management	<ul style="list-style-type: none"> <li>Contractor to ensure stockpiles do not obstruct natural water pathways.</li> <li>Contractor to cover stockpiles exposed to windy conditions or heavy rain with vegetation, cloth, or</li> </ul>	Stockpile management	Stockpile / storage area	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Complied. Stockpile not obstructing natural flow of water

<sup>17</sup> Water quality is affected by the incorrect handling of substances and materials. Soil erosion and sediment is also detrimental to water quality. Mismanagement of polluted run-off from vehicle and plant washing and wind dispersal of dry materials into rivers and watercourses are detrimental to water quality.

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		<ul style="list-style-type: none"> <li>tarps.</li> <li>Contractor to ensure all concrete mixing take place on a designated, impermeable surface.</li> </ul>							
18	Occupational Health & safety	<ul style="list-style-type: none"> <li>Develop and implement site-specific Health and Safety (H&amp;S) Plan</li> <li>Use Personal Protective Equipment like helmet, gumboot, gloves, nose mask and earplugs</li> <li>H&amp;S Training for all site personnel</li> <li>Documentation of work-related accidents;</li> <li>Designate a safeguard focal person and undertake safeguards orientation by PMU/PIU</li> <li>Provide specific guidance for suitable PPE for every on-site work assignment</li> <li>Ensure availability of First aid box at all working sites and labour camp</li> <li>Provide medical insurance coverage for workers;</li> <li>Provide supplies of potable drinking water at working sites;</li> <li>Provide H&amp;S orientation training to all new workers</li> <li>Mark and provide sign boards for hazardous</li> </ul>	<ul style="list-style-type: none"> <li>Site-specific Health and Safety (H&amp;S) Plan</li> <li>Equipped first-aid stations;</li> <li>Medical insurance coverage for workers</li> <li>Number of accidents</li> <li>Supplies of potable drinking water;</li> <li>Record of H&amp;S orientation trainings</li> <li>Personal protective equipments</li> <li>Sign boards for hazardous areas such as energized electrical devices and lines, service rooms</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	<p>Site-specific Health and Safety (H&amp;S) Plan under implementation. Sample health and safety plan is attached as <b>Appendix 7</b>.</p> <p>H &amp; S training Improved – as per instruction</p> <p>Use of PPE – improved. Instructions given for further improvement, particularly use of shoes/ gumboots is required</p> <p>Drinking water and first aid box available at site. Site photo enclosed in <b>Appendix 3</b>.</p> <p>Insurance arranged for the labourer.</p>

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		<p>areas such as energized electrical devices and lines, appropriate</p> <ul style="list-style-type: none"> <li>Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection.</li> </ul>							<p>Attached as <b>Appendix 8</b>. Tie up letter with nearby health center in case of emergency attached as <b>Appendix 9</b>.</p> <p>Minor accident record (first aid) included in <b>Appendix 10</b>. Overall compliance is partially satisfactory</p>
19	Social Impacts <sup>18</sup> - Community Health & safety, accessibility	<ul style="list-style-type: none"> <li>Plan truck routes (for carrying construction materials including pipes) to avoid narrow or congested roads and tourist sites</li> <li>Contractor to ensure disruption of access for local residents is minimized</li> <li>Contractor to restrict activities and movement of staff to designated construction areas</li> <li>Contractor to provide walkways and metal sheets where required to maintain access across for people and vehicles</li> </ul>	<ul style="list-style-type: none"> <li>Traffic Management Strategy</li> <li>Complaints from sensitive receptors</li> <li>Number of signages placed at subproject location</li> </ul>	Project Locations	Contractor	Document check and visual observation	Environment Specialist of DSC and PMU	Do	<p>Partially Complied.</p> <p>Caution tape placed around excavated area. Construction work is mostly carried out within narrow lanes where availability of space for placement of hard barricade is a constraint and there are competing users of space.</p>

<sup>18</sup> Regular communication between the Contractor and the interested and affected parties is important for the duration of the contract.

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		<ul style="list-style-type: none"> <li>• Consideration of public safety - as per prescribed mitigation measures</li> <li>• Contractors to ensure lighting on the construction site</li> <li>• Provide protective fencing around open trenches</li> <li>• Provide road signs and flag persons to warn</li> <li>• Schedule transport and hauling activities during non- peak hours</li> </ul>							Caution tape placed and flag person placed at working area for smooth movement of locals and vehicles. Traffic Management Plan under implementation As per instruction more number of placement of caution and diversion boards are noted. At some of the locations caution/ diversion boards are old. Repairing/ replacement is required. Site photo attached as <b>Appendix 3.</b>
20	Socio cultural resources	<ul style="list-style-type: none"> <li>• Strictly follow the protocol for chance finds in any excavation work</li> <li>• Stop work immediately to allow further investigation if any finds are suspected</li> </ul>	Chance find protocol	Project Locations	Contractor	Checking of records	Environment Specialist of DSC and PMU	Do	Not required till date
21	Employment generation	<ul style="list-style-type: none"> <li>• The use of labor intensive construction measures will be used</li> </ul>	Employment record	Project Locations	Contractor	Checking of records	Environment Specialist of DSC and	Do	At present local laboures are mostly

Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
	where appropriate <ul style="list-style-type: none"> <li>Employ local (unskilled) labor if possible</li> <li>Training of labor to benefit individuals beyond completion of the subproject</li> </ul>					PMU		engaged. List of laborers are attached as Appendix 11

**Table 10: Compliance to EMP of for the Package - Construction of S & D Network and Pumping Station in Borough XIII (Ward 122) including Replacement of GAP Sewer Line in Borough XV, Laying of Pumping Main and Rehabilitation of SSE STP including Operation & Maintenance of the Pumping Stations(s) and STP (KEIIP/ICB/ Tr-1/SD-07/15-16)**

Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation	
<b>Pre Construction - Design phase</b>									
1	Site clearance	Site preparation work including necessary clearance and permission	<ul style="list-style-type: none"> <li>Tree felling requirement – site environment plan</li> <li>NOC – paper documents from line agency</li> </ul>	All Project locations	DSC/PMU	Observation and document checking	Environment Specialist of DSC and PMU	Before commencement of final design	Tree felling not required till date
2	Access to Site	<ul style="list-style-type: none"> <li>Access to site will be via existing roads</li> <li>Involvement of local Traffic Department in the planning stages of the road closure and detour and available on site in the monitoring of traffic in the early stages of the operations during road closure</li> </ul>	<ul style="list-style-type: none"> <li>Involvement of traffic dept.</li> <li>Road closure planning</li> </ul>	Specific project location	DSC/PMU	Site observation	Environment Specialist of DSC and PMU	Do	Complied. Access to site maintained after due consultation with local councilor / authority
3	Affected utilities	Shifting of affected utilities like electric and telephone poles, pipe lines	<ul style="list-style-type: none"> <li>List of affected utilities if any and operators</li> </ul>	Specific project location	DSC/PMU	Observation and document checking	Environment Specialist of DSC and	Do	No shifting of utilities is required till date

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
			<ul style="list-style-type: none"> <li>Bid document to include requirement for a contingency plan for service interruptions</li> </ul>				PMU		
4	Water supply	Health risk due to closure of water supply	<ul style="list-style-type: none"> <li>Schedule of closure</li> <li>Delivery of KMC of potable water to affected people</li> </ul>	-	DSC/PMU	Checking of records Visual observation	Environment Specialist of DSC and PMU	Do	Not required now as per present nature of work. Will be complied as and when required
5	Traffic Management	Planning for Traffic Management	Ensure traffic management plan is part of contract documents and being implemented	-	DSC/PMU	Observation and document checking	Environment Specialist of DSC and PMU	Do	Complied; Traffic management plan prepared; required approvals have been obtained periodically. <b>Appendix 12</b> shows traffic management plan
6	Construction work camps (if needed), hot mix plants, stockpile areas, storage areas, and disposal areas.	<ul style="list-style-type: none"> <li>Planning for setting up worker camps, hot mix plant, stockpile area, storage and disposal areas</li> <li>Prioritize areas within or nearest possible vacant space in the subproject location</li> <li>Non use of residential area</li> <li>Arrangement of toilet and drinking water facility</li> <li>No disposal of waste in water</li> </ul>	List of selected location for construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas	Camp and other sites	DSC/PMU	Observation and document checking	Environment Specialist of DSC and PMU	Before start of physical work & Continuous	Partially Complied. Camp has been established within Keorapukur STP. Sufficient drinking water, toilet facility available. Improvement of camp environment-housekeeping, access is required. Sufficient arrangement of

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
									beds for worker is also required Instruction has been given to contractor for immediate improvement. Required action initiated by the Contractor; being closely monitored for compliance
7	Establishing Equipment Lay-down and Storage Area <sup>19</sup>	<ul style="list-style-type: none"> <li>Choice of location for equipment lay-down and storage areas must take into account prevailing winds, distances to adjacent land uses, general on – site topography and water erosion potential of the soil.</li> <li>Storage areas shall be secure so as to minimize the risk of crime.</li> <li>Away from school and direct residential areas</li> <li>Fire prevention facilities must be present at all storage facilities</li> <li>Proper storage facilities for the storage of oils, paints, grease, fuels, chemicals and any hazardous materials</li> <li>These storage facilities</li> </ul>	List of selected location and facility	Proposed locations considered in the package	DSC/PMU	Site visit and checking	Environment Specialist of DSC and PMU	Before start of physical work & Continuous	Complied Proper storage of fuels, lubricants done Equipment lay-down area demarcated Fire prevention facilities have been arranged at site office/ near fuel store as per instruction. Overall improvement is noted.

<sup>19</sup> Storage areas can be hazardous, unsightly and can cause environmental pollution if not designed and managed carefully

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		(including any tanks) must be on an impermeable surface <ul style="list-style-type: none"> <li>Staff must be aware of their potential impacts and follow the appropriate safety measures</li> </ul>							
8	Education of site staff on general and Environmental Conduct <sup>20</sup>	<ul style="list-style-type: none"> <li>Ensure that all site personnel have a basic level of environmental awareness training</li> <li>All employees must undergo safety training and wear the necessary protective clothing</li> </ul>	Documentation – Training and awareness	-	DSC/PMU	Materials and records on awareness training program	Environment Specialist of DSC and PMU	-	Complied.  Site Safety training and awareness arranged on regular basis
<b>Construction</b>									
9	Materials Management – Sourcing <sup>21</sup>	<ul style="list-style-type: none"> <li>Contractors shall prepare a source statement indicating the sources of all materials (including topsoil, sands, natural gravels, crushed stone, asphalt, clay liners etc), and submit these to the DSC for approval prior to commencement of any work.</li> <li>Use of Govt. approved quarry sites for procurement of materials</li> <li>Verify suitability of all material sources and obtain approval of Investment from PMU/DSC</li> </ul>	<ul style="list-style-type: none"> <li>List of approved quarry sites and sources of materials</li> <li>Bid document to include requirement for verification of suitability of sources and permit for additional quarry sites if necessary.</li> <li>Construction Contractor documentation</li> </ul>	Quarries and material source areas	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Daily visit by construction supervisor of DSC. Weekly visit by Construction Manager, Visit by Environment Specialist and Junior Environmental Scientist on 10.01.2017 17.01.2017 17.02.2017 15.03.2017 12.05.2017	Complied. Approval obtained from PMU and DSC.

<sup>20</sup> These points need to be made clear to all staff on site before the subproject begin.

<sup>21</sup> Materials must be sourced in a legal and sustainable way to prevent offsite environmental degradation.

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
10	Maintenance of Construction Camp	<ul style="list-style-type: none"> <li>Establishment of temporary camps with drinking water, sanitary and solid waste management arrangement</li> <li>Train employees in the storage and handling of materials</li> <li>Remove all wreckage, rubbish, or temporary structures</li> </ul>	<ul style="list-style-type: none"> <li>Complaints from sensitive Receptors</li> <li>Water and sanitation facilities for employees</li> <li>Housekeeping – regular disposal of solid waste</li> </ul>	Camp site	Contractor	<ul style="list-style-type: none"> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	<p>Complied mostly. Camp has been established within Keorapukur STP campus. Sufficient drinking water, toilet facility noted. Improvement of access to toilet and drainage of the waste water from toilet- done Proper bed needs to be provided to labourers. Waste management and overall improvement of housekeeping is noted. Appropriate instructions given. Action initiated by the contractor for filling up the gaps on compliance requirement. <b>Appendix 3</b> shows camp site photo</p>
11	Landscape and Aesthetics	<ul style="list-style-type: none"> <li>Removal of overburden and excavated material from working site and use / preservation of the same – as per mitigation measures</li> <li>Fencing of storage areas</li> </ul>	<ul style="list-style-type: none"> <li>Waste Management List</li> <li>Complaints from sensitive receptors</li> <li>PMU/PIU/DSC</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	<p>Complied Excess earth used mostly for backfilling</p>

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		<ul style="list-style-type: none"> <li>Disposal of construction debris if any as per mitigation measures</li> <li>Prepare and implement Waste Management List</li> <li>Avoid stockpiling of excess excavated soils</li> <li>Coordinate with KMC for beneficial uses of excess excavated soils</li> </ul>	to report in writing that the necessary environmental restoration work has been done						
12	Dust and Air Pollution <sup>22</sup>	<ul style="list-style-type: none"> <li>Selection of materials storage area</li> <li>Water sprinkling at construction site for arresting dust (if any during dry period)</li> <li>Use tarpaulins to cover sand and other loose material- Reducing dust hazard</li> <li>All vehicles and equipments mobilized to construction site and producing emission, have Pollution Control Board certification</li> <li>No fires are allowed on site</li> <li>Carry out air quality monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Location of stockpiles</li> <li>Complaints from sensitive receptors</li> <li>Monitoring data</li> <li>Heavy equipment and machinery with air pollution control</li> <li>Water sprinkling arrangement</li> <li>Cover materials</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Complied Location of stockpiles selected. Covering of materials not done properly Water sprinkling done as per site condition; air quality monitoring done as per EMP. (Complete result certificates available in DSC office as back up paper). Pollution under Control Certificate of vehicles and equipment obtained
13	Noise level	<ul style="list-style-type: none"> <li>Noise producing work needs to be conducted at day time</li> <li>Regular maintenance of noise producing</li> </ul>	<ul style="list-style-type: none"> <li>Complaints from sensitive receptors</li> <li>Use of silencers in noise-</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Complied No such noise generating problem nearby the project

<sup>22</sup> Main causes of air pollution during construction are dust from vehicle movements and stockpiles, vehicle emissions and fires.

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		<p>equipment</p> <ul style="list-style-type: none"> <li>Require horns not be used unless it is necessary to warn other road users</li> <li>Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at a distance of 10 m or more from the vehicle/s</li> <li>At sensitive locations enclosures provided around generator set or other noise producing machinery.</li> </ul>	<p>producing equipment and sound barriers</p> <ul style="list-style-type: none"> <li>Monitoring data</li> </ul>						<p>location. PPE utilized by labourer as per requirement During construction monitoring done. Monitoring will be continued as per EMP. (Complete result certificates available in DSC office as back up paper).</p>
14	Storm water management	Arrangement of drainage of waste water and arresting solid waste/silt from waste water generated at construction site	<ul style="list-style-type: none"> <li>Areas for stockpiles, storage of fuels and lubricants and waste materials</li> <li>Number of silt traps installed along drainages (in slope) leading to water bodies</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Complied as per requirement
15	Water Quality <sup>23</sup>	<ul style="list-style-type: none"> <li>Contractor to ensure run-off from vehicle or plant washing does not enter Hooghly river</li> <li>Contractor to ensure every effort is made that</li> </ul>	Non entry of pollutant in water body	Project Locations	Contractor	Site observation	Environment Specialist of DSC and PMU	Do	Other than STP pond no water source near the construction location

<sup>23</sup> Water quality is affected by the incorrect handling of substances and materials. Soil erosion and sediment is also detrimental to water quality. Mismanagement of polluted run-off from vehicle and plant washing and wind dispersal of dry materials into rivers and watercourses are detrimental to water quality.

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		any chemicals or hazardous substances do not contaminate the soil, Hooghly river, or groundwater on site.							
16	Conservation of Natural Environment	<ul style="list-style-type: none"> <li>Contractor to ensure only trees that have been marked beforehand are to be removed</li> <li>Contractor to immediately re-vegetate stripped areas</li> <li>Contractor to prohibit site staff from gathering firewood, fruits, plants, crops or any other natural material on-site or in areas adjacent to the sites.</li> </ul>	Tree felling requirement and afforestation after final design	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	No tree felling required
17	Materials Management	<ul style="list-style-type: none"> <li>Contractor to ensure stockpiles do not obstruct natural water pathways.</li> <li>Contractor to cover stockpiles exposed to windy conditions or heavy rain with vegetation, cloth, or tarps.</li> <li>Contractor to ensure all concrete mixing take place on a designated, impermeable surface.</li> </ul>	Stockpile management	Stockpile / storage area	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	Complied Stockpile not obstructing natural flow of water
18	Occupational Health & safety	<ul style="list-style-type: none"> <li>Develop and implement site-specific Health and Safety (H&amp;S) Plan</li> <li>Use Personal Protective Equipment like helmet, gumboot, gloves, nose mask and earplugs</li> <li>H&amp;S Training for all site personnel</li> </ul>	<ul style="list-style-type: none"> <li>Site-specific Health and Safety (H&amp;S) Plan</li> <li>Equipped first-aid stations;</li> <li>Medical insurance coverage for</li> </ul>	Project Locations	Contractor	<ul style="list-style-type: none"> <li>Checking of records</li> <li>Visual inspection of sites</li> </ul>	Environment Specialist of DSC and PMU	Do	<p>Site-specific Health and Safety (H&amp;S) Plan under implementation.</p> <p>H &amp; S training done on regular basis. Sample training document</p>

Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
	<ul style="list-style-type: none"> <li>Documentation of work-related accidents;</li> <li>Designate a safeguard focal person and undertake safeguards orientation by PMU/PIU</li> <li>Provide specific guidance for suitable PPE for every on-site work assignment</li> <li>Ensure availability of First aid box at all working sites and labour camp</li> <li>Provide medical insurance coverage for workers;</li> <li>Provide supplies of potable drinking water at working sites;</li> <li>Provide H&amp;S orientation training to all new workers</li> <li>Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, appropriate</li> <li>Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection.</li> </ul>	<p>workers</p> <ul style="list-style-type: none"> <li>Number of accidents</li> <li>Supplies of potable drinking water;</li> <li>Record of H&amp;S orientation trainings</li> <li>Personal protective equipments</li> <li>Sign boards for hazardous areas such as energized electrical devices and lines, service rooms</li> </ul>					<p>is attached as <b>Appendix 15</b></p> <p>Use of PPE – improved. Shoes/ gumboots are not provided to all workers</p> <p>Drinking water and first aid box available at site. Site photo enclosed in <b>Appendix 3.</b></p> <p>Insurance arranged for the labourer. Attached as <b>Appendix 8.</b></p> <p>Tie up letter with nearby health center in case of emergency attached as <b>Appendix 9.</b></p> <p>Minor accident (first aid case) record is shown in <b>Appendix 10.</b></p> <p>Overall compliance is Satisfactory</p>	

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
19	Social Impacts <sup>24</sup> - Community Health & safety, accessibility	<ul style="list-style-type: none"> <li>Plan truck routes (for carrying construction materials including pipes) to avoid narrow or congested roads and tourist sites</li> <li>Contractor to ensure disruption of access for local residents is minimized</li> <li>Contractor to restrict activities and movement of staff to designated construction areas</li> <li>Contractor to provide walkways and metal sheets where required to maintain access across for people and vehicles</li> <li>Consideration of public safety - as per prescribed mitigation measures</li> <li>Contractors to ensure lighting on the construction site</li> <li>Provide protective fencing around open trenches</li> <li>Provide road signs and flag persons to warn</li> <li>Schedule transport and hauling activities during non- peak hours</li> </ul>	<ul style="list-style-type: none"> <li>Traffic Management Strategy</li> <li>Complaints from sensitive receptors</li> <li>Number of signages placed at subproject location</li> </ul>	Project Locations	Contractor	Document check and visual observation	Environment Specialist of DSC and PMU	Do	<p>Complied Caution tape placed around excavated area. Caution board noted. Within narrow lane only caution tape are used</p> <p>Traffic Management Plan prepared and road closure done with due permission from local authority</p> <p>Photo attached as <b>Appendix 3.</b></p>
20	Socio cultural resources	<ul style="list-style-type: none"> <li>Strictly follow the protocol for chance finds in any excavation work</li> <li>Stop work immediately to</li> </ul>	Chance find protocol	Project Locations	Contractor	Checking of records	Environment Specialist of DSC and PMU	Do	Not required till date

<sup>24</sup> Regular communication between the Contractor and the interested and affected parties is important for the duration of the contract.

	Field	Mitigation Activities and Method	Parameters monitored	Location	Responsible for Mitigation	Monitoring Method	Responsible for Monitoring	Date of Monitoring	Compliance Status/ Explanation
		allow further investigation if any finds are suspected							
21	Employment generation	<ul style="list-style-type: none"> <li>The use of labor intensive construction measures will be used where appropriate</li> <li>Employ local (unskilled) labor if possible</li> <li>Training of labor to benefit individuals beyond completion of the subproject</li> </ul>	Employment record	Project Locations	Contractor	Checking of records	Environment Specialist of DSC and PMU	Do	At present outside and local labourers are engaged. List of laborers are attached as <b>Appendix 11</b>

**Table 11: Compliance to EMP of for the Package - Interior renovation of KEIIP office at Business Towers, 206 AJC Bose Road, Kolkata 700017 including Electrical works & Air-conditioning works (KEIIP/NCB/TR-1/BR-08A/2015-16)**

Sr. No.	Field	Mitigation Activities	Responsible for mitigation	Responsible of monitoring	Monitoring method	Compliance status
1	Dust and Air Pollution	<ul style="list-style-type: none"> <li>Use of nose mask to check entry of dust through respiratory system, use of hat/helmet and covering of body is must</li> <li>Selection of areas for disposal of demolition waste- dusty materials</li> <li>Particularly for outside work dampen access and other cleared surfaces whenever possible and especially in dry and windy conditions to avoid excessive dust.</li> <li>Indoor air quality monitoring will be conducted</li> <li>Use tarpaulins to cover sand and other loose material</li> </ul>	Contractor	Environment Specialist of DSC and PMU- Day to day monitoring	Document check and visual observation	Partially complied Instructions given for complete use of nose mask by all workers; Dust not cleaned on daily basis. Demolition waste filled in a bag, stored within office premises and finally transferred to disposal area after due permission. Contractor has been advised for covering of waste material during transportation. Improvement noted as per instruction.
2	Noise level impact	<ul style="list-style-type: none"> <li>Plan activities in consultation with consultant/ project</li> </ul>	Contractor	Environment Specialist of DSC and	Document check and visual	Complied Improvement noted on

Sr. No.	Field	Mitigation Activities	Responsible for mitigation	Responsible of monitoring	Monitoring method	Compliance status
		<p>executing agency so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance</p> <ul style="list-style-type: none"> <li>Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at a distance of 10 m or more from the working area</li> <li>Indoor noise level monitoring</li> </ul>		PMU- Day to day monitoring	observation	application of mitigation measures. Indoor noise level monitoring has been done.
3	Waste water discharge. Maintaining aesthetic environment	Waste water which will generate from washing needs to be discharge into nearby underground drain without accumulation at working site	Contractor	Environment Specialist of DSC and PMU- Day to day monitoring	Document check and visual observation	Complied Done as per requirement
4	Occupational Health & Safety	<ul style="list-style-type: none"> <li>Develop and implement site-specific Health and Safety (H&amp;S) Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use Personal Protective Equipment; (c) H&amp;S Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents.</li> <li>Specifically use of nose mask at dust producing area, ear plugs at noise producing area, helmet during demolition &amp; renovation work, use of safety / welding goggles both at welding time and demolition and cleaning time is essential. All accident needs to be recorded in register.</li> </ul>	Contractor	Environment Specialist of DSC and PMU- Day to day monitoring	Document check and visual observation	<p>Complied mostly First Aid box available at the site; Worker use PPE. Caution tape, working board available at site Instruction has been given to contractor for further improvement. Action has been initiated by the Contractor and is being closely monitored. Health insurance arranged for the worker. Insurance certificate is attached as <b>Appendix 8</b>.</p> <p>Site photo attached as <b>Appendix 3</b>.</p>

Sr. No.	Field	Mitigation Activities	Responsible for mitigation	Responsible of monitoring	Monitoring method	Compliance status
		<ul style="list-style-type: none"> <li>• Availability of First aid box needs to be ensured by contractor. Also emergency number and contact number for nearby doctor to be displayed at working site.</li> <li>• Medical insurance needs to be provided to all workers engage with the project</li> <li>• Health and safety training needs to be provided to all new workers. Training program will be conducted regularly by contractor's manager/ safety officer for their worker and by supervision consultant to the contractor's safety officer/ Manager</li> <li>• Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal.</li> <li>• Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively</li> </ul>				
5	Public safety	<ul style="list-style-type: none"> <li>• During renovation time general public will be not allowed at particular working site</li> <li>• For outside building work safety net and caution tape to be placed. Also movement of public will be restricted.</li> </ul>	Contractor	Environment Specialist of DSC and PMU- Day to day monitoring	Document check and visual observation	Complied General public not allowed at working sites Outside work not yet started
6	Access to work site	<ul style="list-style-type: none"> <li>• Keep the site free from all</li> </ul>	Contractor	Environment	Document check	Complied

Sr. No.	Field	Mitigation Activities	Responsible for mitigation	Responsible of monitoring	Monitoring method	Compliance status
		<ul style="list-style-type: none"> <li>unnecessary obstructions</li> <li>Alternative access for public to be provided at specific zone</li> </ul>		Specialist of DSC and PMU- Day to day monitoring	and visual observation	Alternative access available
7	Storage of materials	<ul style="list-style-type: none"> <li>Storage of materials should be at a place without obstructing public movement and vehicle movement within the building campus.</li> <li>No excess materials stored at working site</li> </ul>	Contractor	Environment Specialist of DSC and PMU- Day to day monitoring	Document check and visual observation	Complied Done as per requirement without obstructing public and vehicle movement
8	Maintaining of safety data sheet by contractor	<ul style="list-style-type: none"> <li>Proper storage facilities for the storage of oils, paints, grease, fuels, chemicals and any hazardous materials to be used must be provided to prevent the migration of spillage into the ground</li> <li>Storage of fuels and hazardous materials (paints &amp; varnish etc.) as per hazardous materials storage and handling rules</li> <li>Material Safety Data Sheet (MDDS) for hazardous chemicals should be readily available at working site</li> </ul>	Contractor	Environment Specialist of DSC and PMU- Day to day monitoring	Document check and visual observation	Under compliance Hazardous materials like use of paints, varnish started. Separate storage has been done at office godown
9	Disposal of construction waste / demolition waste	<p>Waste disposal management plan needs to be prepared. Expected generation of construction waste needs to be assessed. Disposal site is to be selected after complying statutory rules and regulations before starting of disposal.</p> <p>Before acceptance of work all sites to be cleaned and complete removal of waste to be ensured</p>	Contractor	Environment Specialist of DSC and PMU- Day to day monitoring	Document check and visual observation	Complied Waste disposal process continued

## V. ENVIRONMENTAL MONITORING AND EVALUATION

23. In addition to desk reviews and site inspections, monitoring of selected environmental parameters have been conducted during the reporting period. The frequencies of the environmental monitoring activities are commensurate to the type and significance of the impacts. For Tranche 1 subprojects, the parameters to be monitored are ambient air quality, noise levels and for one subproject monitoring has been carried out for river water quality.

24. During year 2014 to 2016 base line monitoring has been conducted for different packages. During construction air quality monitoring has been done for all the packages during said report period. Monitoring and health safety budget of contractor is shown in **Appendix 13**.

25. Base line and during construction air quality monitoring results are shown in **Table 12** below. All test certificates are available in DSC office as back up paper.

26. Salient findings from air quality monitoring are as follows,

- In all cases concentration of SO<sub>2</sub> is within the prescribed standard. At few locations there is marginal increase in SO<sub>2</sub> concentration during construction phase compared to base line level. This increase may be due to local emission from burning of fuels.
- In all cases concentration of NO<sub>x</sub> is within the prescribed standard. Concentration of NO<sub>x</sub> for the package KEIIP/ICB/ Tr-1/WS & SD-04/13-14, KEIIP/ICB/Tr-1/SD-05/13-14, KEIIP/ICB/TR-1/SD-07/2015-16 has increased during construction which may be due to increased movement of traffic at construction site for transportation of workers and materials. Concentrations of NO<sub>x</sub> are below the standard.
- In most of the cases concentration of PM<sub>2.5</sub> is within the prescribed standard. There is marginal decrease of PM<sub>2.5</sub> for most of the sites of different packages. For package KEIIP/ICB/Tr-1/SD-05/13-14 at Sakher Bazar, K.K. Roy Chowdhury Road, Barisha work location PM<sub>2.5</sub> is very high. During report period average concentration of PM<sub>2.5</sub> is above the standard for the package KEIIP/ICB/Tr-1/SD-05/13-14. Water sprinkling at work site will be required for arresting the dust. For package KEIIP/ICB/TR-1/SD-07/2015-16 PM<sub>2.5</sub> is marginally increase during construction. For package KEIIP/NCB/TR-1/BR-08A/2015-16 PM<sub>2.5</sub> concentration during construction was below (46.0 microgram/ cubic meter) the standard. It is noted that level of PM<sub>2.5</sub> increased considerably during construction of the said package. There is requirement of safety equipment like nose mask during construction work.
- In most of the cases during construction, PM<sub>10</sub> are less than base line concentration and within the standard. For package KEIIP/ICB/ Tr-1/WS & SD-04/13-14 PM<sub>10</sub> concentration was high and above or near the standard during construction within report period. For package KEIIP/ICB/Tr-1/SD-05/13-14 PM<sub>10</sub> concentration was marginally above the standard. Application of provisions of EMP like dust suppression and control of vehicle emission at working sites are to be maintained. For package KEIIP/ICB/Tr-1/SD-05/13-14 concentration was always high. For package KEIIP/ICB/TR-1/SD-07/2015-16 PM<sub>10</sub> is marginally increase during construction. For package KEIIP/NCB/TR-1/BR-08A/2015-16 PM<sub>10</sub> concentration level increased considerably during construction. Such increase level inevitable due to negligible airflow in a closed space, where pollutant (dust) dispersion is possible by settling and spraying of water. Also there is requirement of use of safety equipment like nose mask during construction work.
- In most of the cases concentration of Hydrocarbon is below the detection limit

27. Contractors are being advised regularly to take necessary action on dust suppression by sprinkling of water whenever required.

**Table 12: Ambient Air Quality Monitoring Data at working sites**

Package	Monitoring location	Monitoring stage	Date of monitoring	Parameters				
				SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	PM <sub>10</sub> µg/m <sup>3</sup>	HC µg/m <sup>3</sup>
Rehabilitation and Refurbishment of Water Works at Palta and Garden Reach KEIIP/ICB/ Tr-1/WS02/2013-14	Proposed Water Treatment Plant – Palta at Monirampur	Base line	04.03.2015	8.17	34.8	52.63	121.62	3.50
	Near Jetty (Intake 2) - Palta at Monirampur	Base line	04.03.2015	7.50	29.92	48.62	112.81	3.50
	Garden Reach Intake point and treatment plant- near Surinamghat	Base line	07.03.2015	7.49	30.16	52.36	121.89	3.20
	<b>Average Base line</b>			<b>7.72</b>	<b>31.62</b>	<b>51.20</b>	<b>118.77</b>	<b>3.4</b>
	Proposed Water Treatment Plant – Palta at Monirampur	During Construction	30.09.2015	10.04	23.32	19.95	61.79	ND
	Near Jetty (Intake 2) - Palta at Monirampur	During Construction	30.09.2015	10.96	21.07	22.50	68.33	ND
	<b>Average During construction</b>			<b>10.5</b>	<b>22.19</b>	<b>21.22</b>	<b>65.06</b>	<b>ND</b>
	Proposed Water Treatment Plant – Palta at Monirampur	During Construction	11.02.2016	8.87	24.90	21.19	68.26	ND
	Near Jetty (Intake 2) - Palta at Monirampur	During Construction	11.02.2016	9.85	22.23	23.72	73.45	ND
	Proposed Water Treatment Plant – Palta at Monirampur	During Construction	27.05.2016.	8.75	25.38	19.95	61.62	ND
	Near Jetty (Intake 2) - Palta at Monirampur	During Construction	27.05.2016.	10.84	26.68	22.44	87.18	ND
	<b>Average During construction</b>			<b>9.57</b>	<b>24.79</b>	<b>21.82</b>	<b>72.62</b>	<b>ND</b>
	Proposed Water Treatment Plant – Palta at Monirampur	During Construction	31.10.2016	9.08	23.35	22.47	56.85	ND
	Near Jetty (Intake 2) - Palta at Monirampur	During Construction	31.10.2016	10.10	21.55	18.75	84.22	ND
	<b>Average During construction</b>			<b>9.59</b>	<b>22.45</b>	<b>20.61</b>	<b>70.53</b>	<b>ND</b>

Package	Monitoring location	Monitoring stage	Date of monitoring	Parameters				
				SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	PM <sub>10</sub> µg/m <sup>3</sup>	HC µg/m <sup>3</sup>
	Proposed Water Treatment Plant – Palta at Monirampur	During Construction*	18.01.2017	9.39	20.02	19.98	61.34	ND
	Near Jetty (Intake 2) - Palta at Monirampur	During Construction*	18.01.2017	11.48	21.84	21.22	65.85	ND
		<b>Average During construction*</b>		<b>10.43</b>	<b>20.93</b>	<b>20.6</b>	<b>63.59</b>	<b>ND</b>
	Proposed Water Treatment Plant – Palta at Monirampur	During Construction*	3.5.2017	8.87	23.62	19.95	65.29	ND
	Near Jetty (Intake 2) - Palta at Monirampur	During Construction*	3.5.2017	9.93	24.67	23.47	89.54	ND
		<b>Average During construction*</b>		<b>9.4</b>	<b>24.14</b>	<b>21.71</b>	<b>77.41</b>	<b>ND</b>
Laying of water trunk main from Garden Reach waterworks to Taratala valve station and laying of sewer line along Diamond Harbour Road by Micro tunneling method <b>KEIIP/ICB/ Tr-1/WS &amp; SD-04/13-14</b>	2 no. Shaft D H Road Sakherbazar	Base line	03.01.2015	8.50	35.0	28.62	123.82	
	6 no. shaft Taratala Road Jhinjira Bazar	Base line	03.01.2015	8.20	36.54	31.21	126.80	-
		<b>Average Base line</b>		<b>8.35</b>	<b>35.77</b>	<b>29.9</b>	<b>125.3</b>	
	DH Road Shaft no. 17 near 3A bus stand	During construction	31.07.2015	13.41	38.11	28.86	70.85	ND
	Taratala Road Shaft no. 7	During construction	31.07.2015	15.20	36.15	30.10	80.20	ND
	Taratala Road, Shaft No. – 7 (Tunnel) Brace Bridge	During construction	31.07.2015	14.31	34.20	28.82	73.22	ND
		<b>Average During construction</b>		<b>14.30</b>	<b>36.15</b>	<b>29.26</b>	<b>74.75</b>	<b>ND</b>
	DH Road Shaft no. 19	During construction	07.12.2015	5.11	40.73	33.67	85.12	ND
	Taratala Road Shaft no. 1	During construction	07.12.2015	16.05	42.72	28.68	78.37	ND
		<b>Average During construction</b>		<b>10.58</b>	<b>41.72</b>	<b>31.17</b>	<b>81.74</b>	
	<b>DH Road Shaft 19</b>	During construction	08.04.2016	16.75	41.79	34.96	92.45	ND
	<b>Taratala Road, Shaft 11</b>	During construction	08.04.2016	18.72	45.35	29.96	88.83	ND
	<b>DH Road Shaft 21</b>	During construction	02.06.2016	19.29	45.76	31.02	91.32	ND
	<b>Taratala Road, Shaft 03</b>	During construction	02.06.2016	16.88	43.52	26.02	82.45	ND
		<b>Average During construction</b>		<b>17.91</b>	<b>44.10</b>	<b>30.49</b>	<b>88.76</b>	<b>ND</b>
<b>DH Road, Shaft 7</b>	During construction	19.09.2016.	17.14	43.10	31.25	89.57	ND	

Package	Monitoring location	Monitoring stage	Date of monitoring	Parameters				
				SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	PM <sub>10</sub> µg/m <sup>3</sup>	HC µg/m <sup>3</sup>
	Taratala Road, Shaft 13	During construction	19.09.2016.	16.14	46.70	27.50	92.53	ND
		<b>Average During construction</b>		<b>16.64</b>	<b>44.9</b>	<b>29.37</b>	<b>91.05</b>	<b>ND</b>
	James Long Sarani, Shaft No.15	During construction*	5.12.2016	18.79	54.60	41.25	123.93	ND
	DH Road, Shaft No. 6	During construction*	5.12.2016	17.74	49.14	29.93	94.73	ND
		<b>Average During construction*</b>		<b>18.26</b>	<b>51.87</b>	<b>35.59</b>	<b>109.33</b>	<b>ND</b>
	Shaft No. 15 (Taratala Road)	During construction*	3.4.2017	14.47	48.50	28.50	94.55	ND
	Shaft No. 4 (DH Road, Silpara)	During construction*	3.4.2017	18.09	46.19	33.08	96.04	ND
		<b>Average During construction*</b>		<b>16.28</b>	<b>47.34</b>	<b>30.79</b>	<b>95.29</b>	<b>ND</b>
Construction of pumping stations in Begore khal and in Joka Tram Depot and Construction of Sewerage and Drainage Network within Diamond Harbour Road catchment (KEIIP/ICB/ Tr-1/SD-05/13-14)	Nearby Incoming sewer pipeline – SWF & DWF pumping main from Begore Khal Pumping station (PS) – near PS /	Base line	27.12.2014	24.15	48.21	51.19	106.44	-
	Box drain and Begore PS location- near Behala Airport	Base line	27.12.2014	25.33	50.89	57.36	126.84	-
	Near pipe laying work – Junction point of Dakshin Behala Road & Swashan Kalitala road – near Barisha Youth club	Base line	27.12.2014	24.15	49.55	41.15	89.26	-
	Near Joka Tram Depot. Pumping station	Base line	27.12.2014	22.22	48.60	37.41	84.24	-
		<b>Average Base line</b>		<b>23.96</b>	<b>49.31</b>	<b>46.77</b>	<b>101.69</b>	
	Box drain and Begore PS location- near Behala Airport	During construction	31.12.2015	22.66	42.72	38.75	89.02	ND
	Near Joka Tram Depot. Pumping station	During construction	31.12.2015	22.66	62.59	52.43	124.38	ND
	Panch Kari Ghosh Road	During construction	31.12.2015	20.77	59.61	36.30	87.30	ND
		<b>Average During construction</b>		<b>22.03</b>	<b>54.97</b>	<b>42.49</b>	<b>100.23</b>	<b>ND</b>
	Box drain and	During	13.06.2016.	20.11	42.06	40.32	96.53	ND

Package	Monitoring location	Monitoring stage	Date of monitoring	Parameters				
				SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	PM <sub>10</sub> µg/m <sup>3</sup>	HC µg/m <sup>3</sup>
	Begore PS location- near Behala Airport	construction						
	Near Joka Tram Depot. Pumping station	During construction	13.06.2016.	25.83	57.43	52.74	117.5	ND
		<b>Average During construction</b>		<b>22.97</b>	<b>49.74</b>	<b>46.53</b>	<b>107.01</b>	<b>ND</b>
	Begore Khal PS	During construction	27.09.2016.	17.78	44.61	32.46	91.04	ND
	Joka PS	During construction	27.09.2016.	22.71	51.60	52.43	139.42	ND
		<b>Average During construction</b>		<b>20.24</b>	<b>48.10</b>	<b>42.44</b>	<b>115.23</b>	<b>ND</b>
	Joka Pumping Staion	During construction*	19.12.2016.	22.48	59.38	55.00	156.16	ND
	Begore Khal Pumping Station	During construction*	19.12.2016.	19.58	55.51	29.70	95.62	ND
	Amritalal Mukherjee Road (1400 Dia. Pipe Line)	During construction*	19.12.2016.	18.79	57.33	34.96	116.13	ND
		<b>Average During construction*</b>		<b>20.28</b>	<b>57.40</b>	<b>39.88</b>	<b>122.63</b>	<b>ND</b>
	Joka Pumping Staion	During construction*	26.5.2017.	24.15	55.73	47.38	106.42	ND
	Begore Khal Pumping Station	During construction*	26.5.2017.	22.11	46.74	57.36	136.27	ND
	Sakher Bazar, K.K. Roy Chowdhury Road, Barisha	During construction*	26.5.2017.	23.64	54.82	113.54	62.34	ND
		<b>Average During construction*</b>		<b>23.3</b>	<b>52.43</b>	<b>72.76</b>	<b>101.67</b>	<b>ND</b>
Rehabilitation and Replacement of GAP sewer and allied works, KEIIP/ICB/TR-1/SD-07/2015-16	Sodepur Brickfield Road	Base Line	21.06.2016	11.37	26.11	26.28	79.59	-
	Inside Keorapukur STP	Base Line	21.06.2016	10.42	22.48	23.75	65.48	-
		<b>Average Base Line</b>		<b>10.89</b>	<b>24.29</b>	<b>25.01</b>	<b>72.53</b>	-
	Sodepur Brickfield Road (Doctor bagan)	During Construction*	10.12.2016	10.50	28.30	29.52	71.25	ND
	K. K. road pipe laying area	During Construction*	10.12.2016	11.45	29.32	29.36	80.23	ND
		<b>Average During construction*</b>		<b>10.97</b>	<b>28.81</b>	<b>29.44</b>	<b>75.74</b>	<b>ND</b>
	Taratala Road, Lal Gate, Near Castrol India Ltd.	During Construction*	27.05.2017.	18.27	59.39	39.90	97.46	ND
	Santoshpur Road, Near Nature Park	During Construction*	27.05.2017.	17.26	56.65	31.21	87.28	ND
		<b>Average During construction*</b>		<b>17.76</b>	<b>58.02</b>	<b>35.55</b>	<b>92.37</b>	<b>ND</b>

Package	Monitoring location	Monitoring stage	Date of monitoring	Parameters				
				SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	PM <sub>10</sub> µg/m <sup>3</sup>	HC µg/m <sup>3</sup>
Interior Renovation of KEIIP office at Business Towers including Electrical and Air conditioning works, KEIIP/NCB/TR-1/BR-08A/2015-16	2 <sup>nd</sup> Floor of the building	Base Line	24.02.2016.	13.0	22.0	21.0	69.0	ND
	4 <sup>th</sup> Floor of the building	Base Line	24.02.2016.	14.0	24.0	32.0	92.0	ND
		<b>Average Base Line</b>		<b>13.5</b>	<b>23.0</b>	<b>26.5</b>	<b>80.5</b>	<b>ND</b>
	4 <sup>th</sup> Floor of the building	During Construction	23.06.2016.	12.0	26.0	59.0	102.0	-
		<b>Average During Construction</b>		<b>12.0</b>	<b>26.0</b>	<b>59.0</b>	<b>102.0</b>	<b>-</b>
	2 <sup>nd</sup> Floor of the building	During Construction*	<b>12.12.2016</b>	<b>10.0</b>	<b>22.0</b>	<b>46.0</b>	<b>168.0</b>	<b>ND</b>
<b>Standard</b>				<b>80.0</b>	<b>80.0</b>	<b>60.0</b>	<b>100.0</b>	

Note- \* During construction monitoring period from December 2016 to May 2017 – Report periods have been changed as per instructions of ADB to June- November and December-May with the current reporting period being December 2016 – May 2017.

Note- (i) In linear pipeline construction, base line air quality data have been calculated as the average air quality status of the project working area from monitoring at 3 to 4 stations before commencement of the construction work of the package as a whole. This provides a rational basis for comparison of monitored data during construction with the average baseline data as calculated.

(ii) In linear pipe laying packages the activity locations (sinking of shaft, site camp office, deployment of equipment etc.) shifted as construction work progressed from one site to another. Air quality sampling locations shifted accordingly. Location at which construction is complete is abandoned for new stations where construction has commenced.

28. Base line and during construction ambient noise level data are presented in **Table 13**. Noise level (base line and during construction) is always higher at working locations of package KEIIP/ICB/ Tr-1/WS & SD-04/13-14. Since all the working sites are within the main road and accordingly level of ambient noise is higher. Noise level is comparatively low at Palta water works location, which is at an isolated area away from traffic route. In most of the cases Leq value is near the standard in respect to commercial area standard but above the limit when compared to residential area standard. There is marginal increase of noise level for package KEIIP/ICB/ Tr-1/SD-05/13-14 during construction. For package KEIIP/ICB/TR-1/SD-07/2015-16 during construction noise is marginally decreased or increased and values are within the limit, in most of the cases. For package KEIIP/NCB/TR-1/BR-08A/2015-16 during construction noise level is less than base line value. In all the cases mitigation measures need to be applied as per site specific EMP. Particularly use of ear plugs by workers at high noise producing area is necessary. It is ensured that the contractors will strictly implement the action plan as per EMP for reduction of noise level and minimization of noise impact.

**Table 13: Noise Level Monitoring Data at Working Sites**

Package	Sampling Locations	Implementation Stage	Date of Monitoring	Day Time Leq dB(A)	Night Time Leq dB(A)
Rehabilitation and Refurbishment of Water Works at Palta and Garden Reach KEIIP/ICB/ Tr-1/WS02/2013-14	Proposed Water Treatment Plant – Palta at Monirampur	Base line	04.03.2015	53.63	49.18
	Near Jetty (Intake 2) -Palta at Monirampur	Base line	04.03.2015	52.19	49.10
	Garden Reach Intake point and treatment plant-near Surinamghat	Base line	07.03.2015	53.57	52.49
	<b>Average Base</b>			<b>50.1</b>	<b>50.2</b>

Package	Sampling Locations	Implementation Stage	Date of Monitoring	Day Time Leq dB(A)	Night Time Leq dB(A)
	<b>line</b>				
	Proposed Water Treatment Plant – Palta at Monirampur	During Construction	30.09.2015	56.45	47.32
	Near Jetty (Intake 2) -Palta at Monirampur	During Construction	30.09.2015	61.25	53.08
	<b>Average During construction</b>			<b>58.8</b>	<b>50.2</b>
	Near Jetty (Intake 2) -Palta at Monirampur	During Construction	11.02.2016	65.29	56.09
	Water Treatment Plant – Palta at Monirampur	During Construction	11.02.2016	67.09	56.65
	Near Jetty (Intake 2) -Palta at Monirampur	During Construction	03.06.2016.	58.28	52.15
	Water Treatment Plant – Palta at Monirampur	During Construction	03.06.2016.	55.10	51.67
		<b>Average During construction</b>		<b>61.44</b>	<b>54.14</b>
	Near Jetty (Intake 2) -Palta at Monirampur	During Construction*	31.10.2016	63.65	50.59
	Water Treatment Plant – Palta at Monirampur	During Construction*	31.10.2016	69.26	49.47
		<b>Average During construction*</b>		<b>66.45</b>	<b>50.03</b>
	Water Treatment Plant – Palta at Monirampur	During Construction*	18.01.2017.	63.93	55.38
	Intake Jetty Station No. 2	During Construction*	18.01.2017.	56.42	49.37
		<b>Average During construction*</b>		<b>60.17</b>	<b>52.37</b>
	Water Treatment Plant – Palta at Monirampur	During Construction*	3.5.2017.	62.96	53.65
	Near Intake Jetty No. 2	During Construction*	3.5.2017.	55.91	49.26
		<b>Average During construction*</b>		<b>59.43</b>	<b>51.45</b>
Laying of water trunk main from Garden Reach waterworks to Taratala valve station and laying of sewer line along	2 no. Shaft D H Road Sakherbazar	Base line	03.01.2015	84.50	-
	6 no. shaft Taratala Road Jhinjira Bazar	Base line	03.01.2015	74.44	-
		<b>Average Base</b>		<b>79.47</b>	

Package	Sampling Locations	Implementation Stage	Date of Monitoring	Day Time Leq dB(A)	Night Time Leq dB(A)
Diamond Harbour Road by Micro tunneling method KEIIP/ICB/ Tr-1/WS & SD-04/13-14		line			
	DH Road Shaft no. 17 near 3A bus stand	During construction	31.07.2015	68.71	-
	Taratala Road Shaft no. 7 near Brace Bridge	During construction	31.07.2015	67.34	-
	<b>Average During construction*</b>			<b>68.0</b>	-
	DH Road Shaft no. 19	During construction	07.12.2015	68.20	-
	Taratala Road Shaft no. 1	During construction	07.12.2015	60.96	-
	<b>Average During construction</b>			<b>64.58</b>	
	DH Road, shaft 19	During construction	08.04.2016.	77.58	-
	Taratala Road, Shaft 11	During construction	08.04.2016.	73.39	-
	DH Road Shaft no. 21	During construction	02.06.2016.	78.90	-
	Taratala Road Shaft no. 3	During construction	02.06.2016.	77.62	-
		<b>Average During construction</b>		<b>76.87</b>	-
	DH Road Shaft no. 7	DH Road Shaft no. 7	During Construction	19.09.16.	73.17
Taratala Road Shaft no. 13		During Construction	19.09.16.	62.94	-
		<b>Average During construction</b>		<b>68.05</b>	-
James Long Sarani, Shaft No. 15		During Construction*	5.12.2016.	65.77	-
DH Road, Shaft No. 6. Near 500 KVA DG		During Construction*	5.12.2016.	73.39	-
DH Road Shaft No. 6 In Between 125 & 250 KVA DG		During Construction*	5.12.2016.	71.02	-
		<b>Average During Construction*</b>		<b>70.06</b>	
Shaft No. 4 (D.G. Road Silpara)		During Construction*	3.4.2017.	71.24	-
Shaft No. 15 (Taratala Road)		During Construction*	3.4.2017	69.82	-
		<b>Average During construction*</b>		<b>70.53</b>	-
Construction of pumping stations in Begore khal and in Joka Tram	Nearby Incoming sewer pipeline – SWF & DWF pumping main	Base line	27.12.2014	63.97	56.32

Package	Sampling Locations	Implementation Stage	Date of Monitoring	Day Time Leq dB(A)	Night Time Leq dB(A)
Depot and Construction of Sewerage and Drainage Network within Diamond Harbour Road catchment (KEIIP/ICB/ Tr-1/SD-05/13-14)	from Begore Khal Pumping station (PS) – near PS /				
	Box drain location- near Behala Airport	Base line	27.12.2014	54.23	49.91
	Near pipe laying work – Junction point of Dakshin Behala Road & Swashan Kalitala road – near Barisha Youth club	Base line	27.12.2014	60.74	52.26
	Near Joka Tram Depot. Pumping station	Base line	27.12.2014	52.77	48.86
		<b>Average base line</b>		<b>57.92</b>	<b>51.83</b>
	Box drain and Begore PS location- near Behala Airport	During construction	31.12.2015	57.15	51.83
	Near Joka Tram Depot. Pumping station	During construction	31.12.2015	60.05	55.32
	Panch Kari Ghosh Road	During construction	31.12.2015	55.68	51.15
		<b>Average During construction</b>		<b>57.6</b>	<b>52.7</b>
	Near Joka Tram Depot. Pumping station	During construction	13.06.2016.	50.24	47.42
	Box drain and Begore PS location- near Behala Airport	During construction	13.06.2016.	60.08	55.68
		<b>Average During construction</b>	<b>55.16</b>	<b>51.55</b>	<b>55.16</b>
	Box drain and Begore PS location- near Behala Airport	During construction	27.09.16	57.50	51.59
	Near Joka Tram Depot. Pumping station	During construction	27.09.16	63.04	56.98
		<b>Average During construction</b>		<b>60.27</b>	<b>54.28</b>
	Joka Pumping Station	During Construction*	19.12.2016.	58.77	52.54
	Begore Khal Pumping Station	During Construction*	19.12.2016.	65.31	51.13
	Amritalal Mukherjee Road	During Construction*	19.12.2016.	56.44	49.61

Package	Sampling Locations	Implementation Stage	Date of Monitoring	Day Time Leq dB(A)	Night Time Leq dB(A)
	(1400 Dia. Pipe Line)				
		<b>Average During construction*</b>		<b>60.17</b>	<b>51.09</b>
	Begore Khal Pumping Station	During construction*	26.05.2017.	<b>60.03</b>	<b>56.52</b>
	Joka Pumping Station	During construction*	26.05.2017.	<b>58.16</b>	<b>54.48</b>
	Sakher Bazar, K.K. Roy Chowdhury Road, Barisha	During construction*	26.05.2017.	<b>62.06</b>	<b>56.49</b>
		<b>Average During construction*</b>		<b>60.08</b>	<b>55.83</b>
Rehabilitation and Replacement of GAP sewer and allied works, <b>KEIIP/ICB/TR-1/SD-07/2015-16</b>	Sodepur Brickfield Road	Base Line	21.06.2016	65.86	51.58
	Keorapukur STP	Base Line	21.06.2016	58.45	50.09
		<b>Average Base Line</b>		<b>62.15</b>	<b>50.83</b>
	Sodepur Brickfield Road (Doctor bagan)	During construction*	10.12.2016*	54.84	49.59
	K. K. road pipe laying area	During construction*	10.12.2016*	50.30	47.56
		<b>Average During construction*</b>		<b>52.67</b>	<b>48.57</b>
	Taratala Road, Lal Gate, Near Castrol India Ltd.	During construction*	27.05.2017	62.63	53.77
	Santoshpur Road, Near Nature Park	During construction*	27.05.2017	62.74	52.47
		<b>Average During construction*</b>		<b>62.68</b>	<b>53.12</b>
Interior Renovation of KEIIP office at Business Towers including Electrical and Air conditioning works, <b>KEIIP/NCB/TR-1/BR-08A/2015-16</b>	Business Tower, 2 <sup>nd</sup> Floor	Base Line	24.02.2016.	62.64	-
	Business Tower, 4 <sup>th</sup> Floor	Base Line	24.02.2016.	77.55	-
		<b>Average Base Line</b>		<b>70.09</b>	-
	Business Tower, 4 <sup>th</sup> Floor	During Construction	23.06.2016.	82.03	-
		<b>Average During construction</b>		<b>82.03</b>	-
	Business Tower, 2 <sup>nd</sup> Floor	<b>During Construction*</b>	<b>12.12.2016</b>	<b>53.72</b>	
<b>Standard</b>		<b>Day time:</b> Industrial area:75 Commercial: 65 Residential area: 55 <b>Night time:</b> Industrial area:70 Commercial: 55			

Package	Sampling Locations	Implementation Stage	Date of Monitoring	Day Time Leq dB(A)	Night Time Leq dB(A)
		Residential area: 45			

Note- \* During construction monitoring period from December 2016 to May 2017 – Report periods have been changed as per instructions of ADB to June- November and December-May with the current reporting period being December 2016 – May 2017.

Note (i) In linear pipeline construction, base line data have been calculated as the average noise level status of the project working area from monitoring at 3 to 4 stations before commencement of the construction work of the package as a whole. This provides a rational basis for comparison of monitored data during construction with the average baseline data as calculated.

(ii) In linear pipe laying package, the activity locations (sinking of shaft, site camp office, deployment of equipment etc.) shifted as construction work progressed from one site to another. Noise level monitoring locations shifted accordingly. Location at which construction is complete is abandoned for new stations where construction has commenced.

29. Since water source (Hugli river) is involved for the package “Rehabilitation and Refurbishment of Water Works at Palta and Garden Reach”, water quality was monitored for the said package. At present no activity is continued at Palta site but at Garden Reach pilling work at intake jetty location has been started. Monitoring of river water has been conducted after collection of river water sample from upstream and downstream of the intake jetty. Results indicate that concentration for monitored parameters during construction is within the limit except BOD and turbidity. It is noted that base line BOD level for River water was above the national standard but the present (report period) level of BOD is below that of base line BOD level. Therefore project related activities have not contributed to the current elevated (above national standard) BOD concentration. It is noted during construction period both turbidity and total suspended solids are increased. This is due to natural erosion and rainfall condition which results river water more turbid. **Table 14** shows water quality monitoring result.

30. “During construction” air quality, noise level and water quality monitoring will be continued for all packages as per Environment Management and Monitoring Plan. All monitoring expenses will be borne by contractors from their project Health safety monitoring budget (**Appendix 13**).

31. A performance monitoring fact sheet has been prepared to facilitate tracking and quick reference on environmental monitoring of Tranche 1 subproject packages (**Tables 15 and 16**).

**Table 14: Water quality monitoring data for Package KEIIP/ICB/ Tr-1/WS02/2013-14**

Sl. No.	Parameters	SW1	SW2	SW3	SW4	Standard
	<b>Date of sampling</b>	<b>07.03.2015</b>	<b>31.03.2017</b>	<b>07.03.2015</b>	<b>31.03.2017</b>	
1	pH	7.24		7.20		<b>6.5 – 8.5</b>
2	Total Hardness as CaCO <sub>3</sub> -(mg/l)	116.0		116.0		
3	Calcium as Mg(mg/l)	123.06	39.4	30.46	47.5	
4	Magnesium as Mg (mg/l)	8.64		9.6		
5	Chloride as Cl (mg/l)	18.43	20.6	18.43	21.2	<b>600.0</b>
6	Iron as Fe (mg/l)	1.59		2.13		<b>50.0</b>
7	Arsenic (mg/l)	<0.01		<0.01		<b>0.2</b>
8	Cadmium (mg/l)	<0.01		<0.01		<b>0.01</b>
9	Hexavalent Chromium (mg/l)	<0.05		<0.05		
10	Copper as Cu (mg/l)	<0.04		<0.04		<b>1.5</b>
11	Cyanide(mg/l)	<0.05		<0.05		<b>0.05</b>
12	Lead (mg/l)	<0.05		<0.05		<b>0.1</b>
13	Mercury (mg/l)	<0.001		<0.001		
14	Nitrate as NO <sub>3</sub> (mg/l)	12.50		11.20		<b>50.0</b>
15	Total Dissolved Solid (mg/l)	1075.0	<b>146.0</b>	1139.0	<b>190.0</b>	<b>1500.0</b>
16	Phenolic Compounds as Phenol(mg/l)	<0.002		<0.002		<b>0.005</b>
17	Zinc as Zn (mg/l)	0.04		0.04		<b>15.0</b>
18	Sulphate as SO <sub>4</sub> (mg/l)	32.0		24.75		<b>400.0</b>
19	Turbidity (NTU)	2.0	<b>190.0</b>	2.0	<b>120.0</b>	
20	Residual Free Chloride (mg/l)	<0.04		<0.04		
21	Fluoride (mg/l)	<0.1		<0.01		<b>1.5</b>
22	Manganese (mg/l)	0.13		0.15		
23	COD (mg/l)	30.0		35.0		
24	BOD (mg/l)	8.0	<b>7.8</b>	8.0	<b>9.5</b>	<b>3.0</b>
25	Alkalinity (mg/l)	136.0		136.0		
26	Aluminium (mg/l)	<0.02		<0.02		
27	Boron (mg/l)	<0.1	<b>&lt;0.1</b>	<0.1	<b>&lt;0.1</b>	
28	Total Suspended Solids (mg/l)	12.0	<b>78.0</b>	16.0	<b>60.0</b>	

Limit – BIS 2296, surface water quality standard

**Locations:** SW1: **Baseline data**- Hugly river water at Garden Reach intake jetty- upstream, SW2: **During construction**- Hugly river water at Garden Reach intake jetty- upstream SW3: **Baseline data**-Hugly river water at Garden Reach intake jetty- downstream, SW4: **During construction**- Hugly river water at Garden Reach intake jetty- downstream

**Table 15: Performance Fact Sheet for Required Environmental Consents/Clearances of KEIIP Tranche 1 (Package-wise)**

	Package	Name of Contractor	EMP Part of contract Document(Yes / No)	Environmental Consents / Clearances Required					
				Tree Cutting	Crusher	Batching Plant	Hot Mix Plant	Diesel Generator Set	Pollution Under Control (PUC) Certificates for Contractor's Vehicles
1	Rehabilitation and Refurbishment of Water Works at Palta and Garden Reach (KEIIP/ICB/ Tr-1/WS02/2013-14)	M/s ITD-CEM India JV	Yes	Not required till date.	Not required	NR as per present work	NR as per present work	Not required as per present work	Obtained
2	Laying of water trunk main from Garden Reach waterworks to Taratala valve station and laying of sewer line along Diamond Harbour Road by Micro tunneling method (KEIIP/ICB/ Tr-1/WS & SD-04/13-14)	M/s ITD-ITD CEM Jv	Yes	Done after due permission. Compensatory plantation completed	Not required	NR as per present work	NR as per present work	Acoustic type of Generator used. No permission is required. Emission monitoring done.	Obtained
3	Construction of pumping stations in Begore khal and in Joka Tram Depot and Construction of Sewerage and Drainage Network within Diamond Harbour Road catchment (KEIIP/ICB/ Tr-1/SD-05/13-14)	M/s Tantia – MPPL (WILO) Jv	Yes	Not required till date	Not required	NR as per present work	NR as per present work	Not required as per present work	Obtained

	Package	Name of Contractor	EMP Part of contract Document(Yes / No)	Environmental Consents / Clearances Required					
				Tree Cutting	Crusher	Batching Plant	Hot Mix Plant	Diesel Generator Set	Pollution Under Control (PUC) Certificates for Contractor's Vehicles
4	Construction of S & D Network and Pumping Station in Borough XIII (Ward 122) including Replacement of GAP Sewer Line in Borough XV, Laying of Pumping Main and Rehabilitation of SSE STP including Operation & Maintenance of the Pumping Stations(s) and STP (KEIIP/ICB/Tr-1/SD-07/15-16)	M/s SNET-SSG Joint Venture	Yes	Not required till date	Not required	NR as per present work	NR as per present work	Not required as per present work	Obtained
5	Interior Renovation of KEIIP office at Business Towers including Electrical and Air conditioning works, KEIIP/NCB/TR-1/BR-08A/2015-16	M/s S. Mishra Infradev Private Ltd.	Contract clauses related to health and environment attached in the BID document	Not Applicable	Not required	NR as per present work	NR as per present work	Not required as per present work	Obtained

**Table 16: Performance Fact Sheet for EMP Implementation of KEIIP Tranche 1 (Package-wise)**

Package Number	Name of Contractor	EMP Part of contract Document(Yes / No)	Contractor Social/ Environment Person <sup>25</sup>	Overall Status of EMP Implementation	Field to be Monitored as per EMP													
					Source of Materials	Camp Sites	Landscape and Aesthetics	Air Quality	Noise Level	Traffic	Ecological Resources – Terrestrial	Accessibility	Water Quality	Occupational Health & safety	Community Health & safety	Socio cultural resources	Employment generation	
					In compliance (2) / Partial Compliance (1) / Not in compliance (0) / Not applicable (n/a)													
1	Rehabilitation and Refurbishment of Water Works at Palta and Garden Reach (KEIIP/ICB/ Tr-1/WS02/2013-14)	M/s ITD-CEM India JV	Yes	Nominated	Complied	2	2	2	2	2	n/a	n/a	n/a	2	2	n/a	n/a	2
2	Laying of water trunk main from Garden Reach waterworks to Taratala valve station and laying of sewer line along Diamond Harbour Road by Micro tunneling method (KEIIP/ICB/ Tr-1/WS & SD-04/13-14)	M/s ITD- ITD CEM Jv	Yes	Nominated	Complied	2	2	2	2	2	2	2	n/a	2	2	n/a	n/a	2

<sup>25</sup>Nomination of Environmental & Social Safeguard Officer by Contractor(Nominated / Yet to be Nominated)

Package Number	Name of Contractor	EMP Part of contract Document(Yes / No)	Contractor Social/ Environment Person <sup>25</sup>	Overall Status of EMP Implementation	Field to be Monitored as per EMP													
					Source of Materials	Camp Sites	Landscape and Aesthetics	Air Quality	Noise Level	Traffic	Ecological Resources – Terrestrial	Accessibility	Water Quality	Occupational Health & safety	Community Health & safety	Socio cultural resources	Employment generation	
					In compliance (2) / Partial Compliance (1) / Not in compliance (0) / Not applicable (n/a)													
3	Construction of pumping stations in Begore khal and in Joka Tram Depot and Construction of Sewerage and Drainage Network within Diamond Harbour Road catchment (KEIIP/ICB/ Tr-1/SD-05/13-14)	M/s Tantia – MPPL (WILO) Jv	Yes	Nominated	Complied	2	1	2	2	2	2	n/a	2	n/a	1	2	n/a	2
4	Construction of S & D Network and Pumping Station in Borough XIII (Ward 122) including Replacement of GAP Sewer Line in Borough XV, Laying of Pumping Main and Rehabilitation of SSE STP including Operation & Maintenance of the Pumping Stations(s) and STP (KEIIP/ICB/ Tr-1/SD-07/15-16)	M/s SNET-SSG Joint Venture	Yes	Nominated	Complied	2	1	1	2	2	2	n/a	2	n/a	1	2	n/a	1

	Package Number	Name of Contractor	EMP Part of contract Document(Yes / No)	Contractor Social/ Environment Person <sup>25</sup>	Overall Status of EMP Implementation	Field to be Monitored as per EMP												
						Source of Materials	Camp Sites	Landscape and Aesthetics	Air Quality	Noise Level	Traffic	Ecological Resources – Terrestrial	Accessibility	Water Quality	Occupational Health & safety	Community Health & safety	Socio cultural resources	Employment generation
						In compliance (2) / Partial Compliance (1) / Not in compliance (0) / Not applicable (n/a)												
5	Interior Renovation of KEIIP office at Business Towers including Electrical and Air conditioning works, (KEIIP/NCB/TR-1/BR-08A/2015-16)	M/s S. Mishra Infradev Private Ltd.	Contract clauses related to Safety and Environment added in BID document	No specific person	Complied	2	n/a	2	1	2	n/a	n/a	2	n/a	2	2	n/a	2

Note calculation of numerical value for determining performance status- Calculation is based on addition of numerical value like below-

Package - KEIIP/ICB/ Tr-1/WS02/2013-14= Total score- 2+2+2+2+2+2+2 = 16. Number of working field=8, Then- **16/8=2**, More than 1.5 (Complied)

Package- KEIIP/ICB/ Tr-1/WS & SD-04/13-14= Total score- 2+2+2+2+2+2+2+2+2+2= 22. Number of working field=11, Then- **22/11=2**, More than 1.5 (Complied)

Package- KEIIP/ICB/ Tr-1/SD-05/13-14= Total score- 2+1+2+2+2+2+2+1+2+2= 18. Number of field=10, Then- **18/10=1.8**, More than 1.5 (Complied)

Package - KEIIP/ICB/ Tr-1/SD-07/15-16= Total score- 2+1+1+2+2+2+2+1+2+1= 16. Number of field=10, Then- **16/10=1.6** More than 1.5 (Complied)

Package - KEIIP/NCB/TR-1/BR-08A/2015-16= Total score- 2+2+1+2+2+1+2+2= 14. Number of field=8, Then- **14/8=1.75**, More than 1.5 (Complied)

## VI. CONSULTATIONS AND DISCLOSURES CONDUCTED

32. As per approved IEE, consultations and disclosure will be a continuous process throughout Tranche 1 project implementation involving public consultations and focus group discussions. Informal consultations were carried out with local people, pedestrian, etc.

33. The indicative schedule for consultations and disclosure is presented in **Table 17**. **Appendix 14** shows sample consultation sheet as provided by the contractor.

**Table 17: Indicative Schedule for Consultations and Disclosure**

Type of Consultation/ Disclosure	Target Date	Location	Target Participants	Responsible Person and Source of Funds
Local level consultation	Weekly – to be continued	At all construction locations	General public, shop keepers, pedestrian population	Construction supervisor, Environment & safety officer of contractor Project budget – continuous process
Consultation – safety issues, implementation of EMP	During June 2017 to November 2017	At KEIIP office and project site office	Supervisor Engineer, PMU Engineer, all safety and environment staff of contractors	Construction Manager, Environment specialist of DSC and PMU

34. Field level training program has been arranged for contractors, supervisors by DSC's Environment Specialist on safety and environment on regular basis.

35. There are series of informal discussions by the DSC & PMC engineering Consultants with Chief Engineers of KMC and Director General (Projects), PMU mainly on understanding current situation and optimum design to be adopted in order to attain the objectives of taking up the work items.

36. **Appendix 15** shows sample internal training documents as submitted by contractors.

37. **Appendix 16** indicates training detail on environment, Health and safety issues as conducted by DSC at KEIIP office.

## VII. GRIEVANCE REDRESSAL

38. **Common Grievance Redress Mechanism.** A common grievance redress mechanism (GRM) has been established for social, environmental or any other subproject related grievances.

39. **Grievance Redress Process.** PMU will maintain a Complaint Cell at KEIIP office located in 206 A J C Bose Road Kolkata 700017 headed by a designated Grievance Officer (currently the Administrative Officer) under Project Director. The Complaint Cell will also serve as Public Information Centers, where, apart from grievance registration, information on the Project, subprojects, social and environmental safeguards, etc can be provided.

40. At every Borough of KMC under which works are in progress, a Public Relations & Grievance Redressal Unit is to be established for information disclosure on request from public and for receipt of complaints.

41. At Contractors' site offices, complaint and suggestion books will be available for lodging any complaint. The concerned Executive Engineers of KEIIP will monitor these books and if possible take necessary actions for redressal of minor complaints with intimation to the complainant.

42. The Grievance Registration/Suggestion Form will be available at the Complaints Cell and in Borough Offices and will also be downloadable from the KEIIP/KMC websites. Grievances/ suggestions of affected persons can be dropped in suggestion boxes or conveyed through phone or mail. Affected Persons will also be able to register grievances - social, environmental or other, personally at the Complaint Cell and at Borough offices of KMC. The Grievance Officer and designated official at the Boroughs will be able to correctly interpret/record verbal grievances of non-literate persons and those received over telephone.

43. All complaints (unresolved at local site/Borough level) relating to KEIIP will be sent to the Project Director, KEIIP including those received in the KMC/KEIIP website for redressal. The Grievance Officer will resolve simple unresolved issues and in case of complicated issues, consult/seek the assistance of the Environment/Social Specialist of the DSC/PMU. Grievances not redressed through this process within one month of registration will be brought to the notice of the Project Director, KEIIP. Action taken in respect of all complaints will be communicated to the complainant by letter, over phone or e-mail or WhatsApp as the case may be.

44. Periodic community meetings with affected communities to understand their concerns and help them through the process of grievance redress (including translation from local dialect/language, recording and registering grievances of non-literate affected persons and explaining the process of grievance redress) will be conducted if required. The above Grievance Redress Process will be discussed with the stakeholders at the proposed disclosure workshop.

45. **Grievance Redressal Committee (GRC).** A PMU level GRC has already been constituted by the Project Director to address grievances. Grievances not resolved at borough level are referred to PMU level. However grievances that cannot be resolved at PMU level will be referred to an apex grievance redress committee (GRC).<sup>26</sup> Still unresolved issues will be referred to an appropriate court of law.

46. The time limit for grievance redressal will be as follows,

- ✓ Site level – 7 days
- ✓ Borough level – 7 days
- ✓ GRC – PMU level – 15 days
- ✓ Apex GRC- 15 days

47. **Consultation Arrangements.** This will include group meetings and discussions with affected persons, to be announced in advance and conducted at the time of day agreed on with affected persons and conducted to address general/common grievances; and if required with the Environment/Social Specialist of PMU/DSC for one-to-one consultations. Non-literate affected persons/ vulnerable affected persons will be assisted to understand the grievance redress process, to register complaints and with follow-up actions at different stages in the process.

48. **Record-keeping.** Records will be kept by PMU/Borough Office/Contractors' site office of all grievances received including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions and the date these were in effect, and final outcome.

49. **Information Dissemination Methods of the GRM.** Grievances received and responses provided will be documented and reported back to the affected persons (**Appendix 17 - Sample Grievance Registration Format**). The number of grievances recorded and resolved

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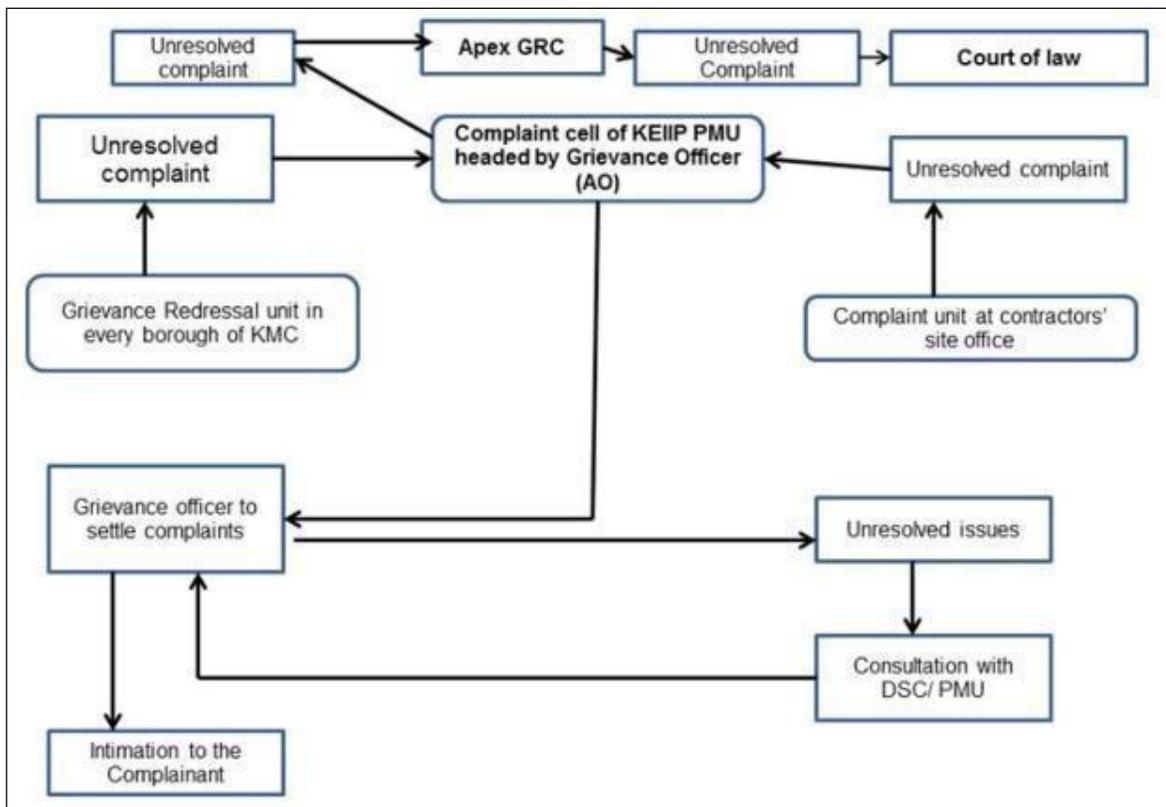
<sup>26</sup> The apex GRC will have the following members: KMC Commissioner as Chairperson, KEIIP Project Director, Director General (P), KEIIP, Environment/Social Safeguard Officer, Administrative Officer as the convener, representatives of APs, Community Based Organizations (CBOs), and eminent citizens. The GRC must have at least two women members.

and the outcomes will be displayed/disclosed in the offices of the different Boroughs of KMC and web. The phone number where grievances are to be recorded will be prominently displayed at the construction sites.

50. Periodic Review and Documentation of Lessons Learned. PMU will periodically review the functioning of the GRM and effectiveness of the mechanism, especially on the Project’s ability to prevent and address grievances.

51. **Costs.** All costs involved in resolving the complaints (meetings, consultations, communication and reporting / information dissemination) will be borne by PMU.

52. **Figure 4** shows GRM flow chart.



**Figure 4: Grievance Redress Mechanism**

53. **Appendix 18** shows sample filled up grievance register as received from contractor.

### VIII. FINDINGS AND RECOMMENDATIONS

54. Based on the foregoing observations, findings and environmental monitoring carried out from December 2016 to May 2017, it may be concluded that KEIIP Tranche 1 sub projects have been implemented in almost full compliance of the required environmental safeguards.

55. Minor, localised and short duration non-compliances in some work sites of a few packages during this period have been listed in paragraph 21. It may please be noted that such new non-compliances arose at new sites opened up during the period under review and which may not be ranked as non-resolved non-compliances reported during July to November, 2016.

56. **Table 18** provides the recommended corrective action plan that has been devised and target dates that have been set so as to remove these non-compliances. The concerned

Contractors have been suitably advised. Contractors have also been advised to provide written commitment for implementation of corrective action plan.

**Table 18: Corrective Action Plan**

	Partial complied issues	Action Required	Responsible	Target Date	Indicator of Compliance
1	Housekeeping and access need improvement (KEIIP/ICB/Tr-1/SD-05/13-14)	Improvement of housekeeping, access at working area and pumping station sites	Contractor	30 <sup>th</sup> June 2017	Site observation and checking
2	Insufficient and old work display board (KEIIP/ICB/Tr-1/SD-05/13-14)	Improvement / sufficient number of work display board. Repairing/replacement of all old work display board	Contractor	7 <sup>th</sup> July 2017	Site observation and checking
3	Use of PPE (particularly working shoes/ gumboots) by contractors' site workers is not always maintained (KEIIP/ICB/Tr-1/SD-05/13-14)	Complete use of PPE, particularly use of working shoes, gumboots	Contractor	30 <sup>th</sup> June 2017	Availability and use of PPE
4	Construction work camp within STP site needs further improvement in respect of house-keeping and provision of basic facilities (like bed) to labourers in the construction camp site (KEIIP/ICB/ Tr-1/SD-07/15-16)	Immediate improvement of housekeeping and basic facilities for workers	Contractor	30 <sup>th</sup> June 2017	Site observation and checking
5	Incomplete use of PPE (particularly working shoes/ gumboots) by contractors' site workers (KEIIP/ICB/ Tr-1/SD-07/15-16)	Complete use of PPE, particularly use of working shoes, gumboots	Contractor	30 <sup>th</sup> June 2017	Availability and use of PPE
6	Control of dust at working site within interior construction area ( KEIIP/NCB/TR-1/BR-08A/2015-16)	Isolation of dust production area for package BR-08A/2015-16, regular cleaning of the working area and use of nose mask by the workers. Contractors are being advised regularly to take necessary action	Contractor	25 <sup>th</sup> June 2017	Site observation and checking

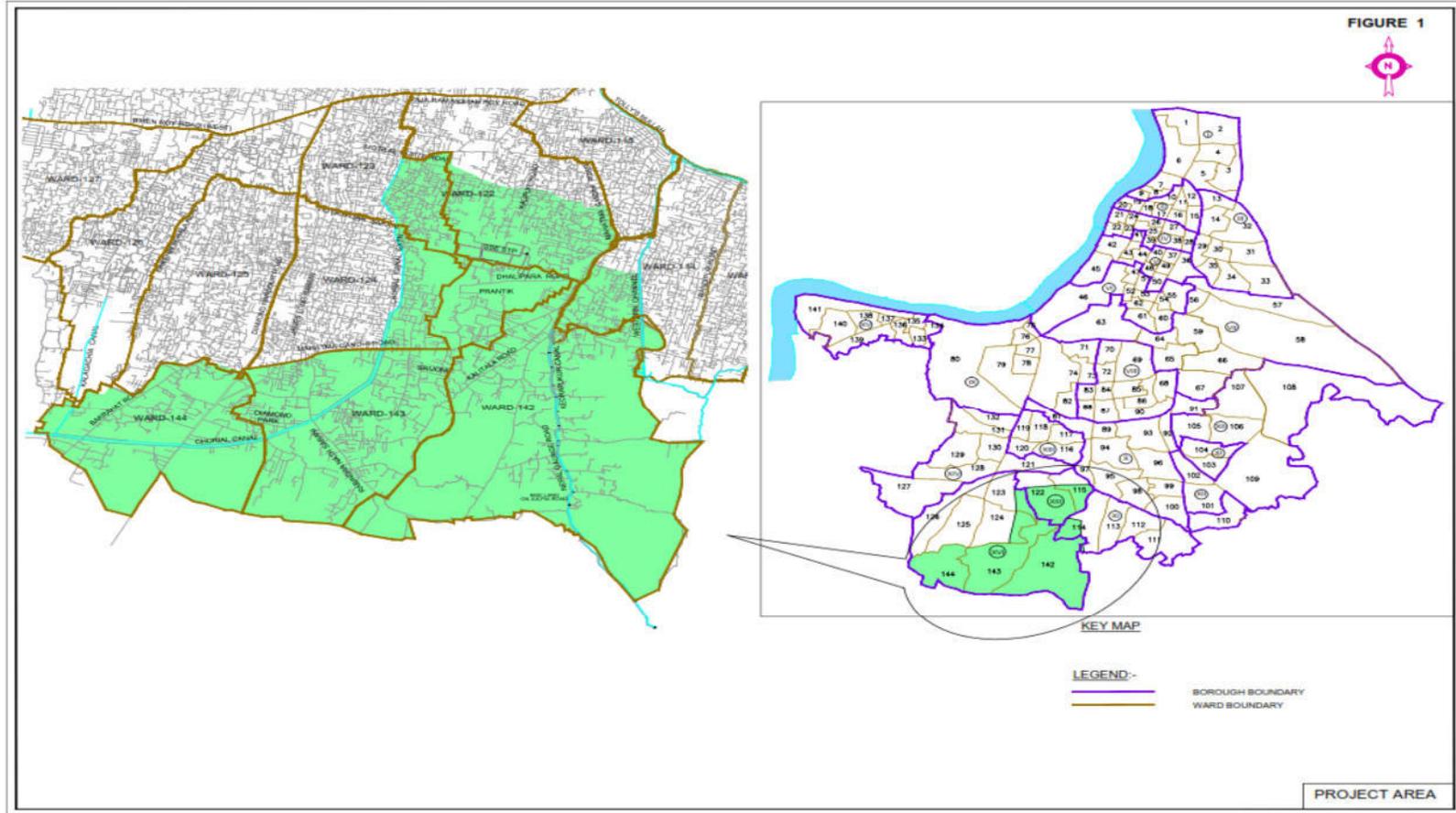
57. **Table 19** lists the implementation status of corrective action (during December 2016 - May 2017) in work sites active during July to November 2016.

**Table 19: Implementation of Corrective Action Plan**

Sr. No	Issues as per SEMR July to November 2016	Action Required as per SEMR July to November 2016	Implementation status of corrective action (during December 2016 to May 2017) in work sites of identified Packages active during July to November 2016
1	Discharge of stagnated water from the labour camp not done properly (KEIIP/ICB/ Tr-	Immediate draining of stagnated water	Improvement has been noted for package KEIIP/ICB/ Tr-1/WS02/2013-14

Sr. No	Issues as per SEMR July to November 2016	Action Required as per SEMR July to November 2016	Implementation status of corrective action (during December 2016 to May 2017) in work sites of identified Packages active during July to November 2016
	1/WS02/2013-14)		Drainage arrangement done at camp site
2	One construction camp within SSE STP site needs improvement (KEIIP/ICB/Tr-1/SD-07/15-16)	Improvement of housekeeping and access to the camp needs to be improved further. Training for the contractor will be organized for maintaining good housekeeping	Housekeeping improved, Access also improved. Training is being arranged on regular basis. Overall improvement is noted for the package KEIIP/ICB/Tr-1/SD-07/15-16 Scope for further improvement
3	One construction work site within STP requires improved storage and fire prevention facilities (KEIIP/ICB/Tr-1/SD-07/15-16)	Improvement of storage and arrangement of fire extinguisher	Improvement has been done as per instruction. Fire extinguisher arranged at camp and fuel storage sites
4	Use of PPE by contractors' site workers is not always maintained (KEIIP/NCB/TR-1/BR-08A/ 2015-16)	Use of PPE particularly nose mask should be at all times as per site condition and work type. Training for the contractor will be organized for proper use of PPE for maintaining personal safety	Improvement is noted in case of use of PPE like nose mask. Training has been conducted for laborers. Regular arrangement of training is required
5	Control of dust at working site within interior construction area ( KEIIP/NCB/TR-1/BR-08A/2015-16 and KEIIP/ICB/Tr-1/SD-05/13-14)	Isolation of dust production area for package BR-08A/2015-16, regular cleaning of the working area and use of nose mask by the workers. Water sprinkling at SD-05/13-14 construction area at required intervals is necessary. Contractors are being advised regularly to take necessary action	Improvement is noted for KEIIP/NCB/TR-1/BR-08A/2015-16. Regular cleaning near working area not done. Still dust is generated at working sites  For package SD-05/13-14 water sprinkling done but further increase in frequency of water sprinkling arrangement is required

### APPENDIX 1: LOCATION MAP PROJECT AREA

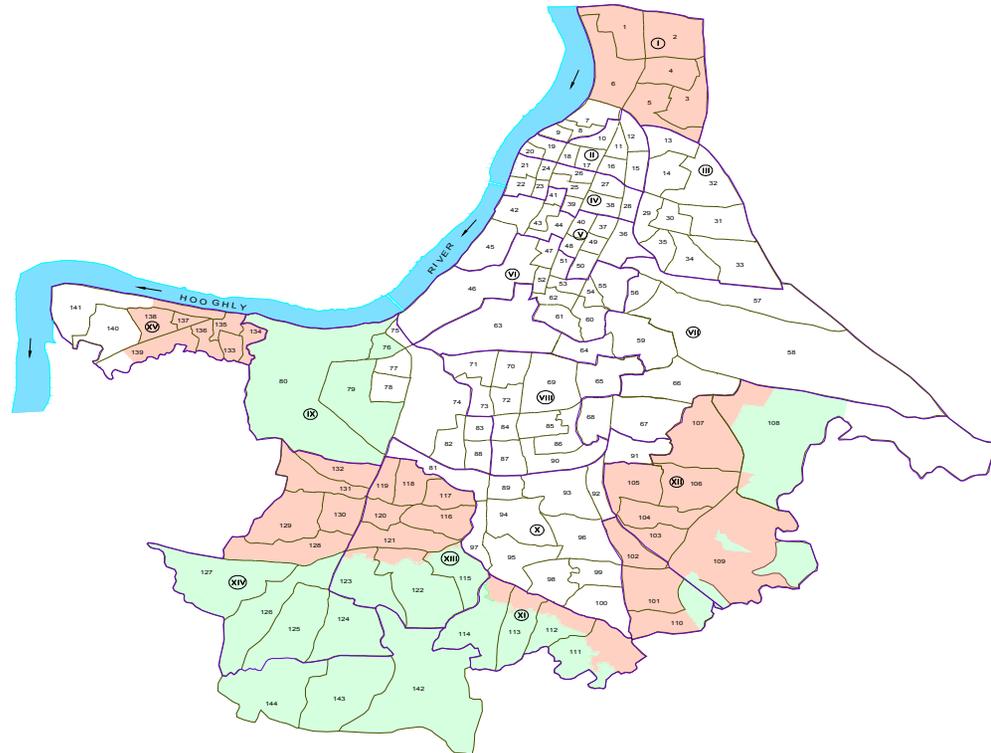


Project Area – water Supply project

## Sewerage and Drainage Project Area

**LEGEND:-**

-  BOROUGH BOUNDARY
-  WARD BOUNDARY
-  AREA TAKEN UP UNDER KEIP PHASE I
-  AREA TO BE CONSIDERED UNDER KEIIP FOR S&D DEVELOPMENT

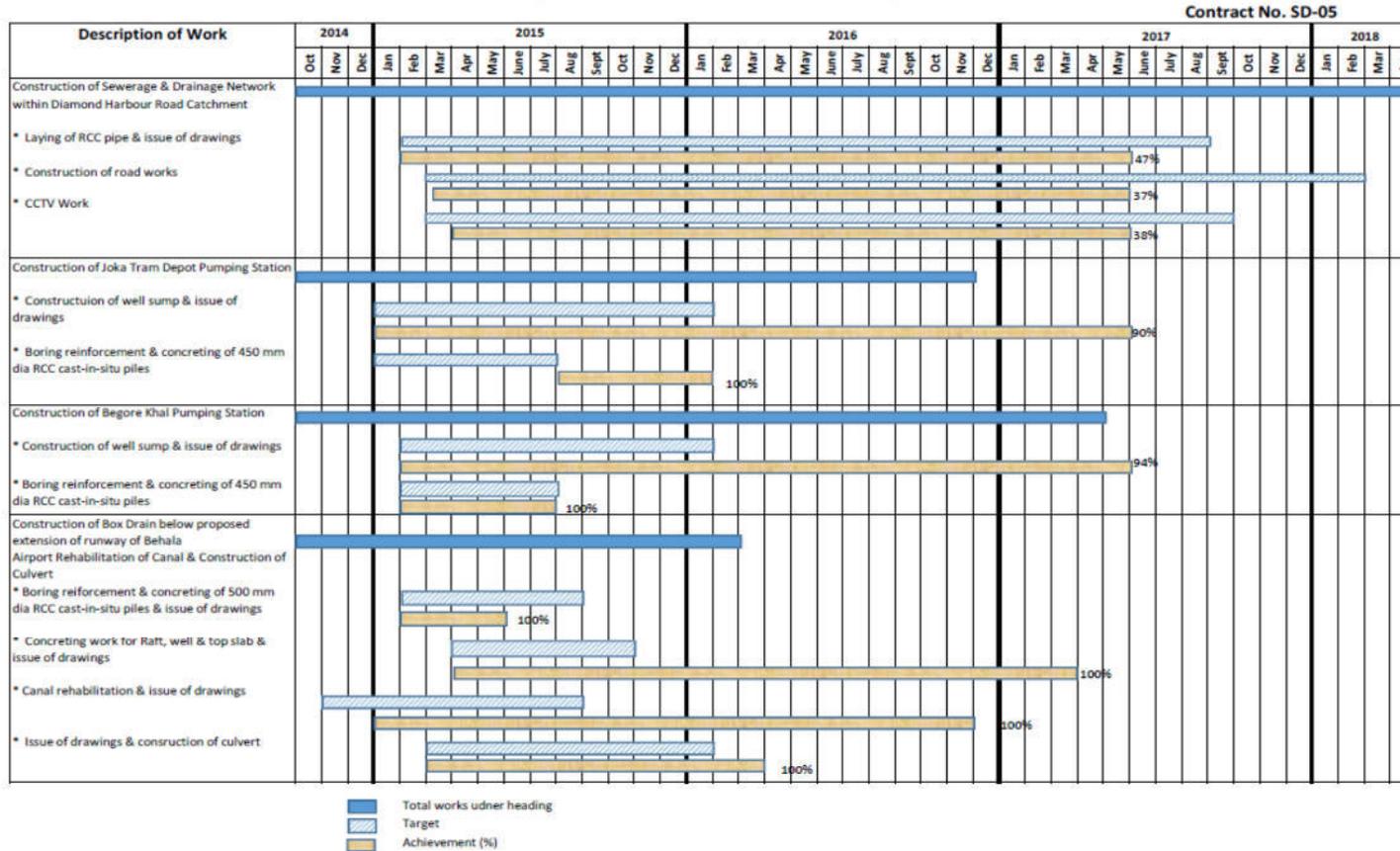






**Package: Construction of pumping stations in Begore khal and in Joka Tram Depot and Construction of Sewerage and Drainage Network within Diamond Harbour Road catchment (KEIIP/ICB/ Tr-1/SD-05/13-14)**

**Construction of Sewerage and Drainage Network within Diamond Harbour Road Catchment  
(Contract No. KEIIP/ICB/TR-1/SD 05/2013-14)**





**Package- Interior Renovation of KEIIP office at Business Towers including Electrical and Air conditioning works, (KEIIP/NCB/TR-1/BR-08A/2015-16)**

KOLKATA ENVIRONMENTAL IMPROVEMENT INVESTMENT PROGRAMME (KEIIP/NCB/TR-1/BR-08A/2015-16) WEIGHTED PHYSICAL PROGRESS OF WORK																	
Sl. No.	Description of Work	Start	City	Physical weightage % of work	NOTICE TO PROCEED 04/02/2016 - DATE OF COMPLETION 03/02/2017												TOTAL
					Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	
<b>Block 08A/2015-16</b>																	
1	Interior Wood Works/Restroom work	1-1	1-1	1.00													
2	Painting & Tile Works	200	200	2.44													
3	Partitions Works & Ceiling work	200	200	2.00													
4	Roofing & Plumbing Works	200	200	2.00													
5	Roofing & Sanitary	1-1	1-1	1.00													
6	General Electrical	1-1	1-1	1.00													
7	Air Conditioning Works	200	200	2.00													
8	Miscellaneous Works	1-1	1-1	1.00													
<b>Block 08B/2015-16</b>																	
1	Interior Wood Works/Restroom work	1-1	1-1	1.00													
2	Painting & Tile Works	200	200	2.44													
3	Partitions Works	200	200	2.00													
4	Roofing & Plumbing Works	200	200	2.00													
5	Roofing & Sanitary	1-1	1-1	1.00													
6	General Electrical	1-1	1-1	1.00													
7	Air Conditioning Works	200	200	2.00													
8	Miscellaneous Works	1-1	1-1	1.00													
<b>Block 08C/2015-16</b>																	
1	Interior Wood Works/Restroom work	1-1	1-1	1.00													
2	Painting & Tile Works	200	200	2.44													
3	Partitions Works	200	200	2.00													
4	Roofing & Plumbing Works	200	200	2.00													
5	Roofing & Sanitary	1-1	1-1	1.00													
6	General Electrical	1-1	1-1	1.00													
7	Air Conditioning Works	200	200	2.00													
8	Miscellaneous Works	1-1	1-1	1.00													
<b>Block 08D/2015-16</b>																	
1	Interior Wood Works/Restroom work	1-1	1-1	1.00													
2	Painting & Tile Works	200	200	2.44													
3	Partitions Works	200	200	2.00													
4	Roofing & Plumbing Works	200	200	2.00													
5	Roofing & Sanitary	1-1	1-1	1.00													
6	General Electrical	1-1	1-1	1.00													
7	Air Conditioning Works	200	200	2.00													
8	Miscellaneous Works	1-1	1-1	1.00													
<b>Block 08E/2015-16</b>																	
1	Interior Wood Works/Restroom work	1-1	1-1	1.00													
2	Painting & Tile Works	200	200	2.44													
3	Partitions Works	200	200	2.00													
4	Roofing & Plumbing Works	200	200	2.00													
5	Roofing & Sanitary	1-1	1-1	1.00													
6	General Electrical	1-1	1-1	1.00													
7	Air Conditioning Works	200	200	2.00													
8	Miscellaneous Works	1-1	1-1	1.00													
<b>Block 08F/2015-16</b>																	
1	Interior Wood Works/Restroom work	1-1	1-1	1.00													
2	Painting & Tile Works	200	200	2.44													
3	Partitions Works	200	200	2.00													
4	Roofing & Plumbing Works	200	200	2.00													
5	Roofing & Sanitary	1-1	1-1	1.00													
6	General Electrical	1-1	1-1	1.00													
7	Air Conditioning Works	200	200	2.00													
8	Miscellaneous Works	1-1	1-1	1.00													
<b>Block 08G/2015-16</b>																	
1	Interior Wood Works/Restroom work	1-1	1-1	1.00													
2	Painting & Tile Works	200	200	2.44													
3	Partitions Works	200	200	2.00													
4	Roofing & Plumbing Works	200	200	2.00													
5	Roofing & Sanitary	1-1	1-1	1.00													
6	General Electrical	1-1	1-1	1.00													
7	Air Conditioning Works	200	200	2.00													
8	Miscellaneous Works	1-1	1-1	1.00													
<b>TOTAL</b>					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**APPENDIX 3: PHOTO ILLUSTRATION**

**Package: Rehabilitation and Refurbishment of Water Works at Palta and Garden Reach**



Labourer hutment within Palta project site. Proper drainage arrangement noted



Proper Cooking arrangement at Labour camp



Construction under progress at WTP site. Use of PPE- noted



Minor work continued at Jetty site of Palta



Proper display board noted at jetty site



Proper storage of oxygen cylinders noted



33 KVA Rubber mat provided at WS 02 package working site



Well Stocked first aid box noted at WTP site



Safety signage noted at work site



Arrangement of Barricade near Jetty

**Package: Laying of water trunk main from Garden Reach waterworks to Taratala valve station and laying of sewer line along Diamond Harbour Road by Micro tunneling method**



**Satisfactory use of PPE by worker at Shaft 4 on DH Road- noted**



**Work in progress at Shaft 4 on DH Road**



**Proper collection of slurry for disposal**



**Proper placement of barricade at working site**



**Workers involved in clearing away spoils from work site**



**Proper "No Entry Board" noted at working sites**



Proper Glow signage noted at working site D. H. Road



Fire fighting equipments noted at Shaft 15 at James Long

Package: Construction of pumping stations in Begore khal and in Joka Tram Depot and Construction of Sewerage and Drainage Network within Diamond Harbour Road catchment



Labourer hutment satisfactory at Joka PS



Satisfactory cooking arrangements at Joka PS



Satisfactory Storage of fuel at Joka PS



Caution tape noted at construction site – Joka PS



Fire extinguisher and sand bucket at SD 05 package site



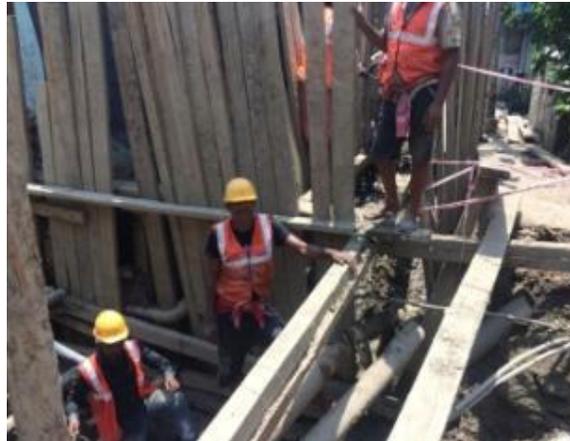
Soiled Display Board with insufficient information noted at Amritalal Mukherjee Road pipe laying site



Housekeeping improved within Begore site office



Begore box drain completed part



Satisfactory use of PPE by workers at Amritalal Mukherjee pipe laying work site



Proper safety barricading noted at Bhattacharjee Para pipe laying site



Employment of female worker noted at Amritalal Mukherjee Road pipe laying site



Traffic diversion board noted at Begore PS pipe laying site



Damaged and incomplete display board at Amritalal Mukherjee pipe laying area



Partial use of PPE by worker at pipe laying area – no shoe / gumboot for worker

**Package- Construction of S&D Network and Pumping Station in Borough XIII (Ward 122) including Replacement of GAP Sewer Line in Borough XV, Laying of Pumping Main and Rehabilitation of SSE STP including Operation & Maintenance of the Pumping Station(s) and STP**



Use of PPE by workers – noted at GAP sewer line area. No use of shoes by labourers - noted



Caution board and caution tape placed at GAP sewer replacement trial pit site



Access available for public at Doctor bagan pipe line location



Fire safety arrangement at working camp site



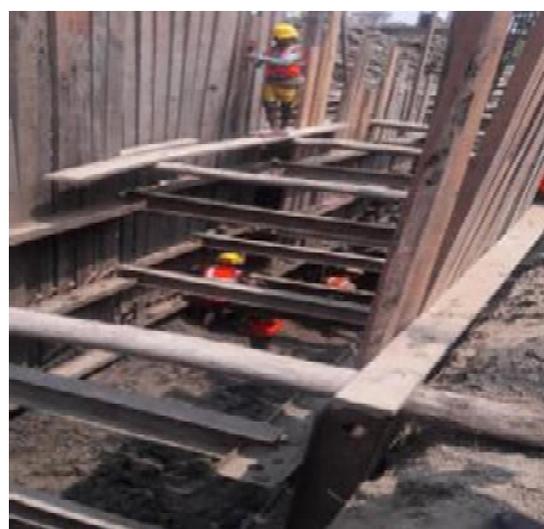
Use of PPE including safety belt at pumping station site



Use of PPE by workers at STP site. No use of shoes by labourer



Caution tape noted at pipeline site



Use of PPE by workers



Placement of first aid box at labour camp



Proper beds not provided for at labourers' hutment



Proper wooden plank provided below electric board



Separate toilets provided for ladies at camp

**Package - Interior Renovation of KEIIP office at Business Towers including Electrical and Air conditioning works**



Signage noted (fourth floor, Business Towers)



Properly stocked first aid box at Fourth floor site office (KEIIP conference room)



**Satisfactory use of PPE by workers at fifth floor C block renovation works**



**Proper storage of construction materials noted at Godown**



**Unsatisfactory use of PPE by workers at fifth floor C block renovation works**



**Proper display board noted**