

Semi-Annual Environmental Monitoring Report

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NEP: Kathmandu Valley Wastewater Management Project

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Kathmandu Upatyaka Khanepani Limited
Project Implementation Directorate
Anamnagar, Kathmandu

**Kathmandu Valley Wastewater
Management Project**
(ADB Loan No. 3000-NEP, SF)

**BIANNUAL SAFEGUARD
REPORT**

For 1st Half, 2018 (January – June)

**Environmental Safeguards
Volume 2 of 2**

July 2018

ABBREVIATIONS

ADB	–	Asian Development Bank
AP	–	affected persons
CASSC	–	Community Awareness and Safeguard Support Consultant
CBO	–	Community Based Organizations
CBS	–	Central Bureau of Statistics
CDC	–	Compensation Determination Committee
CDO	–	Chief District Officer
CFC	–	Compensation Fixation Committee
CPR	–	Community Property Resource
DSC	–	Design and Supervision Consultants
DUDBC	–	Department of Urban Development and Building Construction
EA	–	Executing Agency
GON	–	Government of Nepal
GRC	–	Grievance Redress Committee
HPCIDBC	–	High-Powered Committee for Integrated Development of the Bagmati Civilization
IA	–	Implementing Agency
IP	–	Indigenous People
IR	–	Involuntary Resettlement
IS	–	Interceptor Sewers
KUKL	–	Kathmandu Upatyaka Khanepani Limited
KVWMP	–	Kathmandu Valley Wastewater Management Project
LA	–	Land Acquisition
LA Act	–	Land Acquisition Act
MoWS	–	Ministry of Water Supply
NGO	–	Non-Government Organizations
PCO	–	Project Coordination Office
PD	–	Project Director
PID	–	Project Implementation Directorate
PIU	–	Project Implementation Unit
PLI	–	Poverty Level Income
PM	–	Project Manager
PPTA	–	Project Preparatory Technical Assistance
PSA	–	Poverty and Social Assessment
ROR	–	Right of River
RP/IPP	–	Resettlement Plan
R&R	–	Resettlement and Rehabilitation
sq.m	–	square meter
TA	–	Technical Assistance
ToR	–	Terms of Reference
WWTP	–	Waste Water Treatment Plant

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Executive Summary

The Kathmandu Valley Wastewater Management Project (KVVMP) (ADB Loan No. 3000-NEP) supports the ongoing efforts of the Government of Nepal towards improving the wastewater services in Kathmandu Valley. The major objective of the project is to manage waste water of the Kathmandu valley.

The project is considered Category B as per the SPS 2009 as no significant impacts are envisioned. This Initial Environmental Examination (IEE) is to assess the environmental impacts and provides mitigation and monitoring measures to ensure no significant impacts as a result of the project.

The KVVMP involves (i) rehabilitation and expansion of sewerage network including property connections; (ii) rehabilitation and construction of interceptors along the streams and rivers; (iii) rehabilitation of sewage pumping station; (iv) modernization and expansion of wastewater treatment plants; (v) energy generation of approximately 910 kW through sludge digestion and/or gasification; and (vi) supporting operational and financial improvements and capacity building. The expected outcome of the project will be an improved wastewater collection and treatment system and increased access of wastewater services to the residents of Kathmandu Valley including poor women and men.

Environmental Safeguard condition of the implemented wastewater treatment plant and interceptor sewer projects are Moderately Satisfactory. The physical progress of all the projects are remarkably lower than the expected achievement. Safety is one of the major aspect with the construction of proposed Interceptor Sewer sub-projects; however, no any severe or fatal accident occurred in implemented TP and IS sub-projects. Several instruction letters have been issued to IS-01, IS-02 and IS-03 projects to enhance safety at the working site. The contractors especially of IS sub-projects shall improve safety arrangements enhancing installation of signage and information boards, first aid box to make available in each ongoing construction of Interceptor Sewer (IS) sites. IS-02 has established new camp at Imadole near Kodku khola confluence.

Similarly, no any remarkable impacts upon the surroundings due to noise generated from the construction and excavation work. Further, no any significant impact upon air and surrounding water with the construction activities carried during this biannual. Till date contractor at WWTP-01 has removed 54 number of trees requiring compensatory replantation.

1. Introduction

1.1 Background

The Kathmandu Valley Wastewater Management Project (ADB Loan No. 3000-NEP) supports the ongoing efforts of the Government of Nepal towards improving the wastewater services in Kathmandu Valley. The project will invest in rehabilitation and construction of new wastewater treatment plants, expansion of sewerage network, and improvement of wastewater management in Kathmandu Valley, which also complement past and ongoing Asian Development Bank (ADB) projects.¹ The project is expected to increase operational efficiency, enhance service delivery, and improve health and quality of life of the inhabitants of Kathmandu Valley. The expected outcome of the project will be improved access to efficient and reliable delivery of wastewater services to the residents of Kathmandu Valley, including the poor. Safeguard policy are the policies that require to “avoid, minimize or mitigate adverse environmental and social impacts” that may result from development projects. The safeguard policies adopt “do no harm” approach. Development projects that change patterns of use of land, water and other natural resources can cause a range of resettlement effects.

This is the semiannual environment safeguard report for the month of January to June 2018 and is prepared in compliance with the ADB Policies. The report comprises activities performed under Wastewater Treatment Plant (WWTP) package TP-01, TP-02, and TP-03 and Interceptor Sewer packages IS-01, IS-02 and IS-03.

1.2 Objectives

The major objective of the project is to manage wastewater of the Kathmandu valley; whereas the specific objectives are as follows;

- i. rehabilitating and expanding the sewerage networks;
- ii. modernizing, expanding, and constructing wastewater treatment plants (WWTPs); and
- iii. supporting operational and financial improvements and capacity building.

Kathmandu Valley is characterized by high population growth (estimated to be 6.6% per annum) and high population density (estimated at more than 2,500 persons per km²). The total population of Kathmandu Valley (Kathmandu, Lalitpur and Bhaktapur Districts) was estimated at 2.51 million in 2011 (CBS, census 2011) and will reach 3.26 million by 2021. The existing wastewater network has not been maintained or expanded to serve the spreading urban areas and increased population. This has resulted in untreated sewage being discharged directly into local watercourses. The rivers have become open sewers presenting severe public health risks, in particular to the urban poor. Moreover, poor access to sanitation facilities, an improper solid waste management system, and groundwater and surface water pollution from untreated domestic sewage have caused increased disease, health risks, and associated economic burdens disproportionately impacting the poor and vulnerable.

¹Melamchi Water Supply Project (ADB 1820-NEP); Kathmandu Valley Water Supply Improvement Project (ADB 2776-NEP); Bagmati River Basin Improvement Project (ADB PPTA-43448).

1.3 Environmental category

The project is considered Category B as per the SPS 2009 as no significant impacts are envisioned. This Initial Environmental Examination (IEE) is to assess the environmental impacts and provides mitigation and monitoring measures to ensure no significant impacts as a result of the project.

Similarly, the requirement for environmental assessment in Nepal is established by the National Environment Protection Act, 1997 and Environmental Protection Rules, 1997. The procedures are defined in the Environment Protection Rules, as amended. These rules require IEE for sewerage projects costing more than NRs. 50 lakhs.

1.4 Scope of activities and overview of project information

1.4.1 Scope

The KVWWMP involves (i) rehabilitation and expansion of sewerage network including property connections; (ii) rehabilitation and construction of interceptors along the streams and rivers; (iii) rehabilitation of sewage pumping station; (iv) modernization and expansion of wastewater treatment plants to 90.5 MLD capacity; (v) energy generation of approximately 910 kW through sludge digestion and/ or gasification; and (vi) supporting operational and financial improvements and capacity building. The expected outcome of the project will be an improved wastewater collection and treatment system and increased access of wastewater services to the residents of Kathmandu Valley including poor women and men.

1.4.2 Implementation arrangements

The Ministry of Water Supply (MoWS) will be the executing agency responsible for overall strategic planning, guidance, and management of the project, and for ensuring compliance with loan covenants. Kathmandu Upatyaka Khanepani Limited (KUKL) will be the implementing agency, and the existing Project Implementation Directorate (PID) in KUKL will be responsible for (i) project planning, implementation, monitoring, and supervision; (ii) reporting to KUKL Board of Directors, MoWS, and ADB; and (iii) coordination of all activities in the project. PID has already established a safeguards unit staffed with environmental, social, and legal specialists. The PID, KUKL will recruit two consulting firms, design, supervision and management consultant (DSC) and community awareness and safeguard supporting consultant (CASSC) firm. The DSC will have an environmental and social safeguard specialist to facilitate PID in implementation and supervision of safeguards-related works.

1.4.3 Description of the environment

The project is located in Kathmandu Valley which is densely populated. The project sites are located along the river banks within the 10 to 20 meters of right of river (RoRs) has declared by the HPCIDBC and government-owned land. There are no protected areas, wetlands, mangroves, or estuaries in or near the subproject location. Trees, vegetation are those which are commonly found along the river bank areas; however, the construction and excavation will avoid affecting vegetation as far as possible. Most of the land along the river has been used as cultivation whereas encroachers with some structures are also existed along the river banks. Traditionally river banks have also been utilizing as cultural sites, thus there are some

temples, cremation sites along the river banks. Impact upon such locations have been avoided in design diverting the overlaying of interceptors through such locations. Traffic management will be necessary during the rehabilitation and construction of sewer pipes on busy roads.

1.5 Project safeguards team

The project safeguard team supporting for the L-3000 is presented in the following table.

Table 1-1: Project safeguard support team

Sn.	Name	Designation/Office	Email Address	Roles
1. PID				
1.	Divakar P. Dhakal	Deputy Project Director	divakardhakal@gmail.com	Supervise implemented projects and review of project documents
2.	Laxmi Pant	Chief, Safeguard Unit PID	laxmipant_007@yahoo.com	Maintaining safeguard of TP and IS sub-projects
3.	Vidya Bhandari	Social Development Expert, Safeguard Unit PID	sabaladhar@yahoo.com	Maintaining safeguard of TP and IS sub-projects
2. DSC-04				
1.	Rikesh Chitrakar	Environment Safeguard Specialist	chitrakar.rikesh@gmail.com	Monitoring and supervision of environmental safeguard works of TP and IS projects of L-3000
2.	Pinky Bijayanand	Social Safeguard Specialist	pinkybijayananda@hotmail.com	Monitoring and supervision of social safeguard works of TP and IS projects of L-3000
3. Consultants (CASSC)				
1.	Aanita Janwali	Team Leader, CASSC	anitajawali2010@gmail.com	Overall coordination between the stakeholders, engineers, and client.
2.	Madhukar Shrestha	Public Health Expert-CASSC	madhukarbshrestha@gmail.com	Orientation to community and contractors representative for OHS
3.	Pushpa Koirala	Environment Safeguard Specialist, CASSC	pukoirala80@gmail.com	Generation of awareness at community level and supervision of the sub-projects implemented by PID.
4.	Ram Krishna Giri	Social Safeguard Specialist, CASSC	ramkrishnagiri@gmail.com	Generation of awareness at community level and supervision of the sub-projects implemented by PID.

1.6 Overall project and sub-project progress and status

The proposed project includes (i) rehabilitation or construction of new WWTP already established in different locations in the Kathmandu Valley; (ii) construction of interceptors; and (iii) improvement in the wastewater network system (rehabilitation, replacing, laying of new sewer and storm water drains, etc.).

Wastewater treatment plant (WWTP)

As per the PAM, the work should include the rehabilitation and construction of new WWTP at Kodku 7.0 MLD (Patan), Sallaghari 13.1 MLD (Bhaktapur), Dhobighat 39 MLD (Kathmandu), Guyesheshowri 30.6 MLD (Kathmandu). The two numbers of packages are ongoing for the implementation of WWTPs based on the updated capacity as per the revised design, Package

I consisting of one treatment plant i.e. Guheshwori (32.4 MLD) as WWTP-01 and WWTP-02 consisting of three WWTPs i.e. Sallaghari (14.20 MLD), Kodku (17.5 MLD) and Dhobighat (37 MLD). Similarly, another wastewater treatment plant facility Package III has also been awarded to contractor as BDO contract. The package III comprises construction and expansion of another 37 MLD capacity at Dhobighat. The WWTPs have been designed for extension and rehabilitation in the existing locations, and on government land that was acquired more than 3 decades ago. The land required for updated capacity is within the threshold of available land acquired. Population and service area coverage figures are changed based on current design estimation.

Interceptor Sewers

At present, the KVWWMP is laying interceptors along the banks of Hanumante and Manohara rivers in different packages IS-01 and IS-02 respectively. IS-03 package of interceptor along the banks of Khashyasang Khusung River has also been awarded to contractor, construction work has been started. This is the package of laying of interceptor sewer pipeline laying along the Khashyasang Khusung River catering the sewer into Sallaghari WWTP.

The High-Powered Committee for Integrated Development of the Bagmati Civilization (HPCIDBC) has published a public notice (**Appendix 1**) regarding the construction prohibition for any structures within the right of river (RoR) for different rivers of Kathmandu Valley, which was decided by the Government of Nepal (2065/08/01-2008/11/06). The pipeline alignments will be on existing RoRs. The government has defined 20 m on both banks of rivers in Kathmandu as RoRs, so the interceptors will be laid within the RoWs to the extent technically feasible.

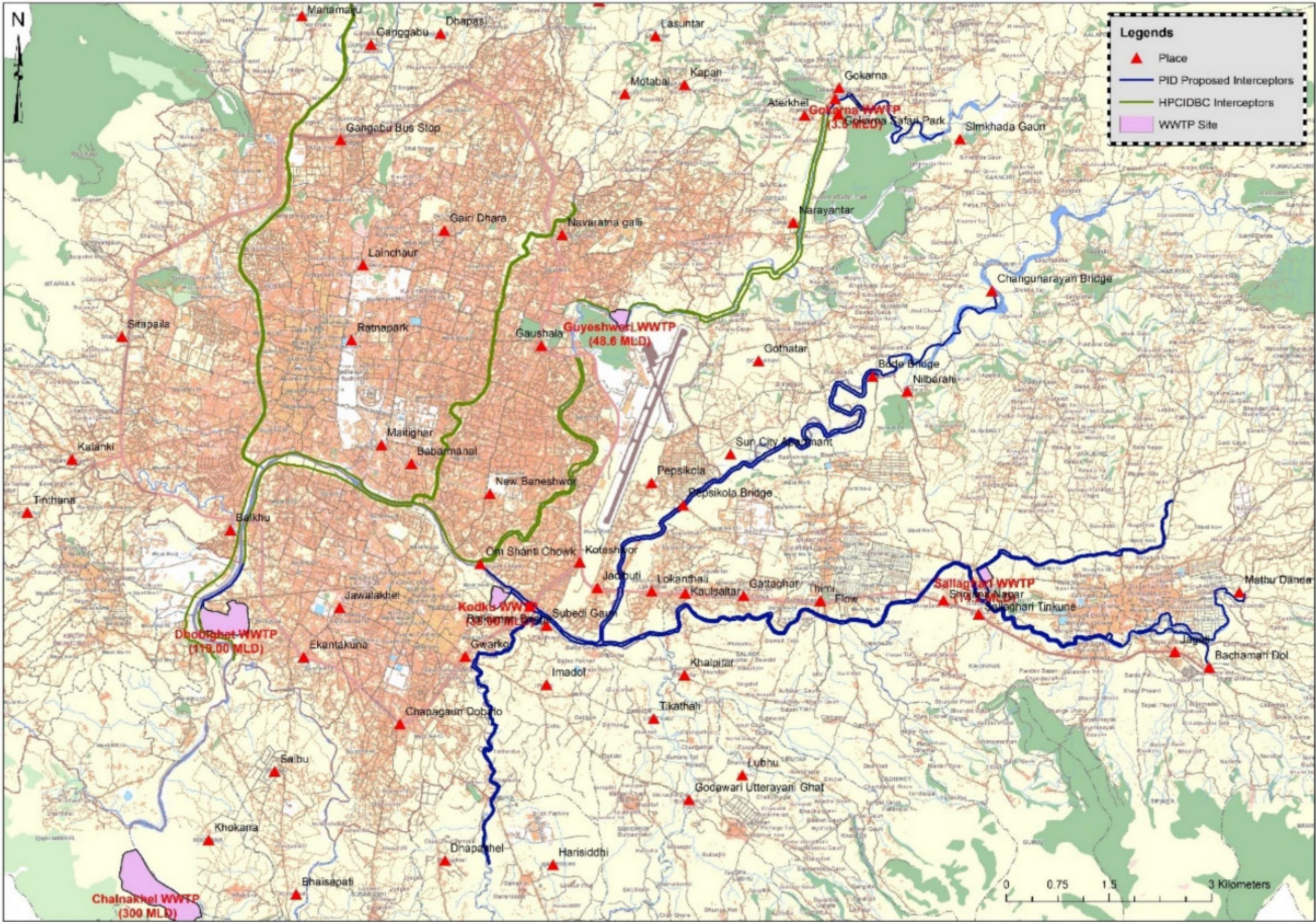


Figure 1-1: Project Locations of WWTP and Interceptor Sewer Lines.

1.6.1 Description of subprojects (package-wise) and status of implementation

The project includes (i) rehabilitation or construction of new WWTP already established in different locations in the Kathmandu Valley; (ii) construction of interceptors; and (iii) improvement in the wastewater network system (rehabilitation, replacing, laying of new sewer and storm water drains, etc.). The description of different components under this project is given below.

A. Wastewater treatment plants (WWTPs)

The work includes the rehabilitation and construction of new WWTP at Kodku (Patan), Sallaghari (Bhaktapur), Dhobighat (Kathmandu) and Guyesheshowri (Kathmandu). All WWTPs designed will be rehabilitated or constructed in the land area of existing WWTPs owned by government.

TP-01

With ADB's concurrence to approve the bid of VA Tech Wabag Ltd., India for the Rehabilitation and Expansion of Wastewater Treatment Plant at Guheshwori with a capacity of 32.4 MLD under Contract No. KUKL/WW/TP/01. The contractor has ongoing environment friendly construction activity within the designated project compound area including safe operation of labour camps with managed waste disposal generated from camps. Workers camps has been established along the boundary area within the project site with the establishment of zinc shades and toilets with pits. Established separate toilets and latrines for male and female. Proper management of drainages within the project area.

The un-going construction work is smoothly without any environmental and social problems as well as without any safety issue. Cumulative project progress is now 64%.

Proper safety measures have been undertaken by the contractor. Personal Protective Equipment (PPEs) have been provided at TP-01 Guheshwori wastewater treatment site and also to other staffs including DSC site engineers. Proper safety signage boards have also been placed properly within the project site in order to maintain safety.

The Salient features of the service contract WWTP-01

Sn.	Particulars	Description
1.	Project location	Guheshwori, at the bank of Bagmati River.
2.	Project Works	Rehabilitation & Expansion of Waste Water Treatment Plant at Guheshwori
3.	Employer	Project Implementation Directorate (PID)/KUKL
4.	Executing Agency	KUKL
5.	Funding Agency	Asian Development Bank and Government of Nepal
6.	Capacity of existing WWTP at Guheshwori	Average flow of 16.2 MLD
7.	Estimated capacity after rehabilitation and expansion	Average flow of 32.4 MLD
8.	Design Life	Structures-minimum 60 years

Sn.	Particulars	Description
		Mechanical and equipment- minimum 15 years
9.	WWTP Components	Screening and Grit chambers, Primary Sedimentation Tanks, Activated Sludge Tanks, Secondary Sedimentation Tanks, Tertiary Treatment Facility, Disinfection Facility, Sludge Thickening Facility, Anaerobic Sludge Digester, Bio-Gas Generation Facilities, Sludge Dewatering machine etc.
10.	Access to site	Can be accessed from Gausala to Chabahil Road.
11.	Contract Duration	24 Months
12.	Intended Completion Date	22 July 2018
13.	Estimated Project Cost	NRs. 2,264,000,000.00/- Excluding VAT NRs. 2,558,320,000.00/- Including VAT

Construction Status of WWTP-01

- Aeration Tank: - Final lift wall with walkway for east side tank is completed and reinforcement & Shuttering for balance is under progress.
- Gravity sludge Thickener: Stone column works and RCC for valve pit & central portion completed. Stone Bedding completed. GST-B: Wall-2nd lift completed and GST-A: PCC for base raft completed, Staircase Pedestal in progress.
- Operation Building- Roof slab, RCC for cable trench completed and Preparatory work for grade slab under progress, Brick work under progress.
- Mixed thickened sludge pump house: Backfilling & compaction in progress.

TP-02

The contract for the construction of treatment plants at Sallaghari, Kodku and Dhobighat with the capacity of 14.2 MLD, 17.5 MLD and 37 MLD respectively, KUKL/WW/TP/02, were awarded to Saf Bon Water Service (Holding) Inc., Shanghai, China has now completed temporary fencing works for the protection of project boundary at Shallaghari and Kodku WWTPs. Fencing work along the Dhobighat will be started soon. The contract package includes rehabilitation and construction of three wastewater treatment plants with a total capacity of 68.7 MLD. Major components of the facilities in each WWTP include primary and secondary treatment units with activated sludge process, and 204 kW of power generation at Dhobighat WWTP through sludge digestion. The contractor has not finalized the design of the WWTP sites of Sallaghari, Kodku and Dhobighat.

The Salient features of the service contract WWTP-02

Sn.	Particulars	Description
1.	Project location	1. Sallaghari, Bhaktapur; 2. Balkumari Kodku and 3. Sundarighat, Dhobighat
2.	Project Works	Rehabilitation & Expansion of 3 Waste Water Treatment Plant at Sallaghari, Kodku and Dhobighat

Sn.	Particulars	Description
3.	Employer	Project Implementation Directorate (PID)/KUKL
4.	Executing Agency	KUKL
5.	Funding Agency	Asian Development Bank and Government of Nepal
6.	Estimated capacity after rehabilitation and expansion	1. 14.2 MLD, 2. 17.5 MLD and 3. 37.0 MLD
7.	Design Life	Structures-minimum 60 years Mechanical and equipment- minimum 15 years
8.	WWTP Components	Screening and Grit chambers, Primary Sedimentation Tanks, Activated Sludge Tanks, Secondary Sedimentation Tanks, Tertiary Treatment Facility, Disinfection Facility, Sludge Thickening Facility, Anaerobic Sludge Digester, Bio-Gas Generation Facilities, Sludge Dewatering machine etc.
9.	Access to site	Can be accessed easily in all sites with existing road networks
10.	Contract agreement date	26 January 2017 (7 May 17- Commencement)
11.	Contract Duration	913 days
12.	Intended Completion Date	5 November 2019
13.	Contract amount	NRs. 3,920,622,374.18

Construction Status of WWTP-02

- Project is effective and site team was mobilized since May 7, 2017.
- Project office was setup on June 1, 2017.
- Site team is working on site preparation and design team is working on basic design in project office and head office continuously.
- 468 meters of sewer pipe line has been laid with 9 numbers of manholes completed without slab along the right bank of Manohara River, at the downstream of Kodku WWTP. Construction of 5 manholes are still remaining among the total of 14.
- 202 number of stone column piling works is completed out of 388. Piling of 186 number of stone columns are still remaining.

TP-03

Treatment plant at Dhobighat with the capacity of 37 MLD respectively, KUKL/WW/TP/03, were awarded to CGCOC-ATAL J/V, China and now preparing Detail Design. Executed kickoff meeting during last quarter.

The Salient features of the service contract WWTP-03

Sn.	Particulars	Description
1.	Project location	1. Sundarighat, Dhobighat near Bagmati River
2.	Project Works	Construction of Waste Water Treatment Plant
3.	Employer	Project Implementation Directorate (PID)/KUKL
4.	Executing Agency	KUKL

Sn.	Particulars	Description
5.	Funding Agency	Asian Development Bank and Government of Nepal
6.	Estimated capacity after rehabilitation and expansion	1. 37.0 MLD (Dhobighat WWTP)
7.	Design Life	Structures-minimum 60 years Mechanical and equipment- minimum 15 years
8.	WWTP Components	Screening and Grit chambers, Primary Sedimentation Tanks, Activated Sludge Tanks, Secondary Sedimentation Tanks, Tertiary Treatment Facility, Disinfection Facility, Sludge Thickening Facility, Anaerobic Sludge Digester, Bio-Gas Generation Facilities, Sludge Dewatering machine etc.
9.	Access to site	Can be accessed easily in all sites with existing road networks
10.	Contract agreement date	26 January 2017 (7 May 17- Commencement)
11.	Contract Duration	913 days
12.	Intended Completion Date	5 November 2019
13.	Estimated Project Cost	NRs. 1,736,630,317.54 Excluding VAT NRs. 1,962,392,258.82 Including VAT

Construction Status of WWTP-03

Mobilization has not been started. No construction work started yet.

B. Interceptor Sewers**Interceptor Sewer IS-01**

The interceptor package Contract No. KUKL/WW/IS-01, comprising intercepting sewers on the both sides of Hanumante River (25.3 km), includes construction of intercepting sewerage system along both bank of Hanumante River from Jagati of Bhaktapur along the left bank and from Chokin Chilla bridge at Kharipati along right bank of Hanumante up to Manohara confluence downstream. Other major components include 648 numbers of manhole, 6 numbers of river crossing and 8.7 km of river protection works. This package is in the stage of construction. The construction of intercepting sewer system along the Hanumante River is on progress. However, not more than approximately, 23.78% of physical progress has been completed.

The major environmental challenges facing by the contractor while excavating trench and overlaying of sewer pipeline along the Hanumante (IS-01) is (i) due to solid waste directly disposed along the river bank by Bhaktapur Municipality. There are especially three locations along the river bank (Chundevi, Shallaghari-near Radhe Radhe Bridge, and at the confluence of Hanumante and Khasang Kusung khola) where the excavation work for the river training and overlaying of sewer pipeline has already been completed. (ii) As the interceptor alignment passes through the cultivated land; most of the farm land has been cultivated with paddy, vegetables, potato etc.; the overlaying of sewer pipeline is challenging along the cultivated land. Though the contractor pre-informed the land owners or tenant along the interceptor alignment; the month of June to September is monsoon season and is the significant time for

the cultivation of paddy. (iii) Further, significant encroachment at the several locations along the interceptor alignment especially in IS-01 has also barred contractor to execute the task smoothly.

The Salient features of the service contract IS-01

Sn.	Particulars	Description
1.	Project	Construction of Intercepting Sewerage System along Hanumante River
2.	Total length of Interceptor Sewer	25.33 Km
3.	Major Works	Hume pipe laying: 25.33 km Manholes: 648 nos. Aqueducts/crossings: 6/3 River Training works: 8,654 m Overflow/outfall structures: 83/83
4.	Contract No.	KUKL/WW/IS-01
5.	Contractor	GIETC-Lama-Raman JV, Maharajgunj, Kathmandu, Nepal
6.	Contract Amount	NRs. 562,869,202.55 without VAT NRs. 636,042,198.88 including VAT
7.	Contract Award Date	27 March 2016
8.	Commencement Date	3 May 2016
9.	Contract Period	720 Days (24 months)
10.	Completion Date	22 April 2018

Construction Status of IS-01

- Completion of laying of Interceptor of 11962.5 meter in length
- Construction of Masonry wall were carried out at Manahara confluence and of which 130 cum of masonry was completed during the month of June.
- 400mm dia pipe was laid from HUR 113 TO HUR 107 CH: 0+722 to 1+206 at Dhudhpati area.
- Concreting works for Manhole were carried out at Libali area, Thimi area, Ghalate area and Sallaghari Gurukul area.
- Installation of medium duty and heavy duty of manhole cover was completed at Libali and Sallaghari Gurukul area.
- Construction of Manhole at Thimi area HI 89, HL 88, HL 87, were under construction and accomplished upto its top level. Construction of Manhole at Ghalate area HI70 and HI 71 are completed. Construction of manhole at Sallaghari Gurukul area HUL99. HUL 100, HUL101, HUL 102, HUL 103, HUL 104 and HUL 105 is completed.
- Construction of 137 m of aqua duct slab completed
- Construction of 200 m pile of river training work completed
- Construction of 130 numbers of manhole completed; 83 number are at its finishing level

Interceptor Sewer IS-02

Further, the package for the construction of intercepting sewerage system along Manohara River (11.36 km), Contract No. KUKL/WW/IS-02 package includes extension and construction of intercepting sewer system along both banks of Manohara River from Manohara and Hanumante confluence up to Sun City colony along Manohara. Other major component includes 284 numbers of manhole, 6 numbers of river crossing and 6.98 km of river protection works. The proposed section also comprises Manohara Area Land Pooling Project between Pepsicola bridge to Jadibuti Plan; where the project has planned for river diversion and training works along approximately.

The Salient features of the service contract IS-02

Sn.	Particulars	Description
1.	Project	Extension and Construction of Intercepting Sewerage System along Manohara River
2.	Total Length of Interceptor Sewer	11.36 km
3.	Major Work	Hume pipe laying: 11.36 km Manholes: 284 nos. Aqueducts/crossings: 4 River Training works: 6,976 m Overflow/outfall structures: 33/33
4.	Contract No.	KUKL/WW/IS-02
5.	Contractor	ZIEC-Sharma-BKOl JV, China/Nepal
6.	Contract Amount	NRs. 677,854,967.85 without VAT NRs. 765,976,113.67 including provisional and VAT
7.	Contract Award Date	19 October 2016
8.	Commencement Date	2 November 2016
9.	Contract Period	720 Days (24 months)
10.	Completion Date	22 October 2018

Construction Status of IS-02

- Task completed for the laying of sewer pipeline
 - 1200mm dia- 867.5 RM
 - 1000mm dia- 1324.0 RM
 - 900mm dia- 478.74 RM
 - 600mm dia- 1582.75 RM
- Black topped road reinstatement work 812.48 meters
- Under bridge crossing work- 1200mm diameter pipe was done for 32.5 m length of RCC duct under the Balkumari Bridge has been constructed.
- Piling work for under bridge crossing at Pepsicola bridge at both side was done.

Interceptor Sewer IS-03

The interceptor package Contract No. KUKL/WW/IS-0, comprising intercepting sewers on the both sides of Khashyasang Khusung River (7.679 km), includes construction of intercepting sewerage system along both bank of the River starting from near the Changunarayan Bridge which caters sewerage into Sallaghari Waste Water Treatment

Plant. As there is no any physical progress achieved for this project. The contractor has not mobilized any resource to the site. Joint survey prior to the construction is ongoing. Further, under the rehabilitation and expansion of sewerage network,

Because of availability of cultivated land on the both side of the River there is no any significant obstruction of physical structures along the proposed Riverbanks throughout the length. However, at the Kalighat Cremation site the sewerage network has been diverted to the existing road instead of following river bank in order to avoid laying of interceptor through the cultural heritage site. As the cremation site has its significant cultural importance in the area. The river bank also comprises substantial number of trees growing all along the bank. The dense vegetation has been protecting riverbank along the river alignment. However, if some vegetation or trees affected with the excavation and installation of sewerage pipelines; compensation in the ratio of 1:25 for the affected trees have been proposed as mitigation measures in the EMP.

The Salient features of the service contract IS-03

Sn.	Particulars	Description
1.	Project	Extension and Construction of Intercepting Sewerage System along Khasang Kusung River
2.	Total Length of Interceptor Sewer	7.86 km
3.	Major Work	Hume pipe laying: 11.36 km Manholes: 182 nos. Aqueducts/crossings: 3 Overflow/outfall structures: 15
4.	Contract No.	KUKL/WW/IS-03
5.	Contractor	ZIEC-Sharma-BKOl JV, China/Nepal
6.	Contract Amount	NRs. 366,213,220.29 without provisional sum and VAT NRs. 413,820,938.93 including provisional sum and VAT
7.	Contract Award Date	15 December 2018
8.	Commencement Date	12 January, 2018
9.	Contract Period	18 months
10.	Completion Date	8 June 2019

Construction Status of IS-03

- The project construction of sewer collector along Khasang Khusung River is under construction with completion of laying of sewer pipe of 220m in length.
- The contractor is working on manhole structure between manhole numbers KKL70 to KKL75. The major works under the manhole are excavation in foundation, granular filling, PPC (M15) and RCC (M25) in base of the manhole.

Package wise status of each sub projects are presented in the following table.

Table 1-2: Status of each package

Package Number	Components/List of Works	Contract Status (specify if under bidding or contract awarded)	Status of Implementation (Preliminary Design/Detailed Design/On-going Construction/Completed/O&M) ²	If On-going Construction	
				%Physical Progress	Expected Completion Date
KUKL/W W/TP-01	Construction and improvement of Treatment Plant at Guheshwori	Contract awarded on 25 Sep, 2016	Detail Design completed substantially; Construction ongoing.	64.00%	22 Jul, 2018
KUKL/W W/TP-02	Construction of Treatment Plants at Sallaghari, Kodku, and Dhobighat	Contract awarded 7 May, 2017 (30.43 Months Construction + 60 Months Operation)	Detail Design ongoing; Construction of sewer line started. No any construction activity within the Kodku, Sallaghari and Dhobighat WWTP.	17%	19 Sept, 2019 completion of installation of plants and equipments 6 Nov, 2024
KUKL/W W/TP-03	Construction of additional Treatment Plants at Dhobighat	26 January 2017 (7 May 17-Commencement)	Detail Design ongoing; mobilization not started at Dhobighat WWTP.	Construction not started	5 November 2019
KUKL/W W/IS-01	Construction of Interceptor Sewer along the bank of Hanumante River	Contract awarded on 17 Jan, 2016	Detail Design completed; Construction ongoing.	23.78%	22 Apr, 2018
KUKL/W W/IS-02	Construction of Interceptor Sewer along the bank of Manohara River	Contract awarded on 25 Sep, 2016	Detail Design completed; Construction ongoing.	13.52%	23 Oct, 2018
KUKL/W W/IS-03	Construction of Interceptor Sewer along the bank of Khashyang Khusung River	Contract awarded 15 Dec, 2017	Detail Design completed; Joint survey ongoing, Construction not started.	2.96%	8 June 2019

2. Compliance status of project

The project has fulfilled all the statutory requirements in order to safeguard environment with the consequences due to construction works.

² % of physical progress and expected date of completion

Table 2-1: Compliance status with national environment requirement

Package No.	Sub-project Name	Statutory Environmental Requirements³	Status of Compliance⁴	Validity if obtained	Action Required	Specific Conditions that will require environmental monitoring as per Environment Clearance, Consent/Permit to Establish⁵
KUKL/W W/TP-01	Guheshwori WWTP	Initial Environmental Examination (IEE)	IEE report approval under process	N/A	N/A	No any permission required
KUKL/W W/TP-02	Sallaghari, Kodku and Dhobighat WWTPs	Initial Environmental Examination (IEE)	IEE report approval under process	N/A	N/A	No any permission required
KUKL/W W/IS-01	Hanumante Interceptor Sewer	Initial Environmental Examination (IEE)	IEE report approval under process	N/A	N/A	No any permission required
KUKL/W W/IS-02	Manohara Interceptor Sewer	Initial Environmental Examination (IEE)	IEE report approval under process	N/A	N/A	No any permission required
KUKL/W W/IS-03	Khashyang Khusung Interceptor Sewer	Initial Environmental Examination (IEE)	IEE report approval under process	N/A	N/A	No any permission required

³ Specify (environmental clearance? Permit/consent to establish? Forest clearance? Etc.)⁴ Specify if obtained, submitted and awaiting approval, application not yet submitted⁵ Example: Environmental Clearance requires ambient air quality monitoring, Forest Clearance/Tree-cutting Permit requires 2 trees for every tree, etc.

3. Compliance status with environmental loan covenants

The compliance status with environmental and social loan covenants are presented in the following table.

Table 3-1: Status of environmental loan covenants

S.N.	Covenants as Mentioned in Schedule 5	Status of Compliance	Action Required
	Implementation Arrangements		
	Land Acquisition and Involuntary Resettlement		
Loan Agreement Schedule 5, para 3	The Borrower shall ensure, or cause KVWSMB and KUKL to ensure, that all land and all rights-of-way required for the Project are made available to the Works contractor in accordance with the schedule agreed under the related Works contract and all land acquisition and resettlement activities are implemented in compliance with (a) all applicable laws and regulations of the Borrower relating to land acquisition and involuntary resettlement; (b) the Involuntary Resettlement Safeguards; and (c) all measures and requirements set forth in the RP, RF and any corrective or preventative actions set forth in a Safeguards Monitoring Report.	No major land acquisition is involved in the activities of packages of construction of interceptors and wastewater treatment plants of the project. However, most of the land along the river banks are cultivated and locals are still cultivating paddy and vegetables.	During construction, contractor will inform locals along the interceptor sewer alignment prior to the excavation of trench in order to harvest the cultivations and will let the locals continue their cultivation after installation of sewer pipelines and manholes.
Loan Agreement Schedule 5, para 4	Without limiting the application of the Involuntary Resettlement Safeguards or the RP, and in addition to paragraph 8 of Schedule 4 of this Loan Agreement, the Borrower shall ensure, or cause KVWSMB and KUKL to ensure, that no physical or economic displacement takes place in connection with the Project until: (a) compensation and other entitlements have been provided to affected people in accordance with the RP; and (b) a comprehensive income and livelihood restoration program has been established in accordance with the RP.	No physical or economic displacement has been taken place.	Implementation of RP

	Indigenous Peoples		
Loan Agreement Schedule 5, para 5	The Borrower shall ensure that the Project does not have any indigenous peoples impacts within the meaning of SPS. In the event that the Project does have any such impact, the Borrower shall take all steps required to ensure that the Project complies with the applicable laws and regulations of the Borrower and with the SPS.	No major indigenous peoples impacts is involved in the activities	No any action required.
Loan Agreement Schedule 5, para 6	The Borrower shall make available KVWSMB and KUKL to make available necessary budgetary and human resources to fully implement the EMP and the RP.	PID now has Safeguards Unit with full-time officers and Community Awareness and Social Safeguard Consultant (CASSC) is in place	CASSC in place
	Safeguards – Related Provisions in Bidding Documents and Works Contracts		
Loan Agreement Schedule 5, para 7	The Borrower shall ensure, or cause KVWSMB and KUKL to ensure, that all bidding documents and contracts for Works contain provisions that require contractors to: <ul style="list-style-type: none"> (a) comply with the measures relevant to the contractor set forth in the IEE, the EMP, and the RP (to the extent they concern impacts on affected people during construction), and any corrective or preventative actions set forth in a Safeguards Monitoring Report; (b) make available a budget for all such environmental and social measures; (c) provide the Borrower with a written notice of any unanticipated environmental, resettlement or indigenous peoples risks or impacts that arise during construction, implementation or operation of the Project that were not considered in the IEE, the EMP, and the RP; (d) adequately record the condition of roads, agricultural land and other infrastructure prior to starting to transport materials and construction; and (e) reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction. 	Complied. All bidding documents are prepared as per ADB Standard Bidding Document (SBD).	No any action required.
	Safeguards Monitoring and Reporting		
Loan Agreement Schedule 5, para 8	The Borrower shall do the following, or cause KVWSMB and KUKL to do the following: <ul style="list-style-type: none"> (a) submit semiannual Safeguards Monitoring Reports to ADB and disclose relevant information from such reports to affected persons promptly upon submission; (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 	Mentoring and reporting will be done as per covenants	No any action required.

	IEE, the EMP, and the RP, promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan; and (c) report any actual or potential breach of compliance with the measures and requirements set forth in the EMP or the RP promptly after becoming aware of the breach.		
	Labor Standards		
Loan Agreement Schedule 5, para 10	The Borrower and KUKL shall ensure that the contractors comply with all applicable labor, health, and safety laws and regulations of the Borrower and, in particular, (a) do not employ child labor for construction and maintenance activities, and (b) provide appropriate facilities (latrines, etc.) for workers at construction sites. The Borrower shall require contractors not to differentiate wages between men and women for work of equal value. The Borrower and KUKL shall ensure that specific clauses shall be included in bidding documents to ensure adherence to these provisions, and that compliance are strictly monitored during project implementation.	Complied. PID through its Design and Supervision Engineer (DSC) is supervising and monitoring the compliance with labor, health and safety law regulations. The project work is in compliance with ADB's requirements and national laws & regulations.	No any action required.
	Gender and Development		
Loan Agreement Schedule 5, para 11	The Borrower shall cause KUKL to (a) implement the GESI action plan and CAPP in a timely manner over the entire Project period; (b) achieve the targets stated in those documents; (c) allocate adequate resources for this purpose; (d) provide training to all Project staff on GESI action plan and CAPP; and (e) closely monitor and report progress on the implementation of GESI and CAPP to ADB.	Partially Complied. Community Awareness Consultant (CASSC) is in place, GESI action plan and CAPP shall be implemented.	Effective implementation
	Grievance Redress Mechanism		
Loan Agreement Schedule 5, para 16	Within 12 months of Effective Date, KUKL shall prepare a grievance redress mechanism, acceptable to ADB, and establish a special committee to receive and resolve complaints and grievances or act upon reports from stakeholders on misuse of funds and other irregularities, including grievances due to any resettlement. The special committee shall (a) make public the existence of the grievance mechanism, (b) review and address grievances of stakeholders of the Project, in relation to either the Project, any of the service providers, or any person responsible for carrying out any aspect of the project; and (c) proactively and constructively responding to them.	Partially complied. Grievance redress mechanism (GRM) established but is only being partially implemented. A special committee in PID to receive and resolve complaints and grievances has also been formed. At field level, GRM committee formation is in process.	Effective implementation

4. Compliance Status with the Environmental Management Plan

All the compliance status related Environmental Management Plan of all sub-projects implemented under loan 3000 is presented hereunder.

Table 4-1: Package-wise IEE Documentation Status

Package Number	Final IEE based on Detailed Design				Site-specific EMP (or Construction EMP) approved by Project Director? (Yes/No)	Remarks
	Not yet due (detailed design not yet completed)	Submitted to ADB (Provide Date of Submission)	Disclosed on project website (Provide Link)	Final IEE provided to Contractor/s (Yes/No)		
KUKL/WW/TP-01	Comments on updated IEE received from ADB and incorporation of comments ongoing	31 Dec, 2017 E-copy for review	Not yet	EMP attached in Bidding document	Construction EMP prepared and approved	Existing IEE of all the project was updated and send informally to ADB mission team for review. Comments from ADB team received. Package wise IEE reports are established for TP and IS sub-projects
KUKL/WW/TP-02	Comments on updated IEE received from ADB and incorporation of comments ongoing	31 Dec, 2017 E-copy for review	Not yet	EMP attached in Bidding document	Construction EMP prepared	
KUKL/WW/TP-03	Comments on updated IEE received from ADB and incorporation of comments ongoing	31 Dec, 2017 E-copy for review	Not yet	EMP attached in Bidding document	Construction EMP not prepared	
KUKL/WW/IS-01	Comments on updated IEE received from ADB and incorporation of comments ongoing	31 Dec, 2017 E-copy for review	Not yet	EMP attached in Bidding document	Construction EMP prepared and approved	
KUKL/WW/IS-02	Comments on updated IEE received from ADB and incorporation of comments ongoing	31 Dec, 2017 E-copy for review	Not yet	EMP attached in Bidding document	Construction EMP prepared and approved	
KUKL/WW/IS-03	Comments on updated IEE received from ADB and incorporation of comments ongoing	31 Dec, 2017 E-copy for review	Not yet	EMP attached in Bidding document	Construction EMP prepared	

Table 4-2: Package-wise Contractor/s' Nodal Persons for Environmental Safeguards

Package Name	Contractor	Nodal Person	Email Address	Contact Number
KUKL/WW/TP-01	VA TECH WABAG LTD.	Mr. Ratnakar Kakarla	ratnakarkakarla@gmail.com wabag@wabag.in	Cell: 977-1-9823870473
KUKL/WW/TP-02	Safbon Water Service (Holding) INC., Shanghai No. 666, Zhangliantang Road, Qingpu District, Shanghai People's Republic of China	Mr. Li Qiang	liqiangqiang@safbon.com , safbon@safbon.com	Phone: 0977-1-9851188288, +86-21-62569366 Fax: +86-21-62564865
KUKL/WW/TP-03	CGCOC-ATAL J/V	Mr. Jiang Yimiao	jiangyimiao@cgoewater.com	
KUKL/WW/I S-01	GIETC-LAMA-RAMAN JV	Mr. Raj Kumar Shrestha	Shrestharajer@gmail.com lamaconstruction.nepal@gmail.com	Phone: 0977-1-4412756, Fax: 0977-1-4410286
KUKL/WW/I S-02	ZIEC-SHARMA-BKOI. P.O. Box 9961, Tangal, Kathmandu, Nepal	Mr. Narayan Giri	rr_narayan69@yahoo.com hkkoirala@gmail.com , bbkoibuilders@yahoo.com	Phone: 0977-1-4428769, 4440902, Fax: 0977-1-4430166
KUKL/WW/I S-03	LAMA-RAMAN-GOLDEN GOOD JV	Mr. Pushkar Thakuri	nepalithakuri@gmail.com goldengood2052@gmail.com	Phone: +977-01-4107909 Fax: +977-01-4107908

Summary of Environmental Monitoring Activities (for the Reporting Period)⁶**Table 4-3: Environmental monitoring indicators and status for IS-01**

Project Stage	Project Activity	Potential Environmental Impacts in IEE	Proposed Mitigation Measures in IEE	Remarks
Construction Phase	Construction Activity			
	Earthworks	Soil erosion and slope instability due to topsoil stripping and excavation for trenches	Separate stockpiling of topsoil for further use; spoil disposal at designated and stabilized sites; compact the excavated areas" backfill and include replacement of topsoil; adopt cut and fill approach; avoid work during the rainy	- In most of visited sites excavated material piled safely but on some it is not done properly
		Surface water discharges to local drainage from trench construction	Season as much as possible; do mulching to stabilize exposed areas; use bioengineering techniques (e.g, re-vegetating areas promptly); provide channels and ditches for post-construction flows; line steep channels and slopes (e.g. use of jute matting); prevent off-site sediment transport using settlement ponds, silt fences. Dispose of excess materials in designated areas	Bioengineering will be carried out after laying of sewer pipes along the bank of river
			Use settling basins at reservoir sites; use straw to filter small discharges; do routine inspection and monitoring of larger discharges to water courses. Excavation dewatering to use settlement tanks.	N/A
		Runoff from construction areas including stockpiled materials	Use temporary bunds and catchment basins. Grade soil/sand stockpiles to prevent erosion.	NO any erosion identified
		Excavation and laying of pipeline/ siphons at river crossings could impact the river water quality and ecosystem.	Do construction in the dry season only; use river diversions with bundings; give prior notification of construction activities, schedule and affected areas including anticipated effects in river sections	- Now the interceptor pipe lying work has been stopped due to onset of monsoon season.
		Interception and interference with localized groundwater flows due to deep excavations.	Bund local wells, springs, and irrigation canals from temporary spoil dumps; monitor local wells and spring fed spouts or kuwas particularly downhill of reservoir excavations, including temporary supply provided if flow is affected; provide permeable base and side backfill at deeply excavated reservoir sites or an alternate source of drinking water at the existing location.	No direct impact upon local water resources.

⁶ Attach Laboratory Results and Sampling Map/Locations

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Project Stage	Project Activity	Potential Environmental Impacts in IEE	Proposed Mitigation Measures in IEE	Remarks
	Quarrying from river bed	Change in river hydrology and morphology	Do not allow quarrying/mining activities in river/streams to extract construction materials and change the river cross sections and longitudinal profiles. Quarry site shall be environmentally safe and has acquired environmental permits such as IEE for the excavation.	NO any quarry and mining established along the interceptor and river alignment.
	Dumping of waste in the river Construction of toilets in the camps Storing of materials and dumping of excess materials in the project area Handling of toxic materials	Water and land pollution	Provide designated areas with collection bins for wastes. Provide toilet facilities and prohibit open defecation. Prohibit washing of vehicles next to rivers and streams. Ensure site is well-signed indicating the restrictions. Store construction aggregates, hazardous and toxic materials, lubricating, oils and used batteries in safe areas and away from any drainage leading to water bodies; have designated bunded areas for storage. Dispose of any wastes generated by construction activities in designated areas. Provide training to workforce on safe handling of toxic materials and occupational health and safety measures during construction. Use personal protective equipment at all times while on site	<ul style="list-style-type: none"> - No dedicated area for the collection of waste at vicinity of construction area. Litter bin has been placed only at labor camp but not at construction area. - Pit latrine is used at camp but not constructed accord to standard norms. - No tool box talk is in practice yet all. - The compliance of use of PPE i.e. reflective jacket, safety boots, gloves, hard helmet and mask by workers seems satisfactory. Also, other construction personnel (site in charge, safety officer and engineer are encouraged to wear PPE as well
	Quarrying operations Movement of vehicles Operation of crusher Earthworks Stockpiling of construction waste and construction materials	Air quality deterioration	Dust suppression on roads or at open sites by sprinkling water as required at regular intervals. Cover earth stockpiles using plastic sheets or cement jute bags. Use tarpaulins to cover sand and other loose materials during transport. Limit vehicle speed to 10-15 km/hr; site to be signed specifying speed limits. Ensure that vehicles comply with the National Vehicle Mass Emission Standards, 2056 BS. Do regular maintenance of vehicles. Provide ventilation in confined working areas.	<ul style="list-style-type: none"> - Water sprinkle is not in practice for the suppression of dust. - Contractor's check his machinery intermittently not on regular fashion. No equipment tagging system. - No proper and well ventilation to pass air at labor camp. In some camp they have maintain locally managed ventilation
	Movement of vehicles Operation of crusher	Noise and vibration	Monitor noise levels regularly at site to meet the noise standards (Annex 6) Fit mufflers in vehicles to control noise. Limit the speed of vehicles.	<ul style="list-style-type: none"> - No any noise monitoring mechanism. - No use of mufflers in vehicle to control noise. - No provision of air muff/plug/cotton to workers.
	Construction of project structures	Vegetation clearance	Cut only trees that are marked and have been approved by the Department of Forestry. Plant and rear tree saplings at the rate of 25 saplings for each felled tree.	- Some affected site has been vegetated using pioneer grasses.

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Project Stage	Project Activity	Potential Environmental Impacts in IEE	Proposed Mitigation Measures in IEE	Remarks
		Damages to fisheries and aquatic ecology of riverbeds and habitats.	Do construction during dry season only and use river diversions and bunding work sections.	
	Reinstatement of damaged community services and infrastructure	Reinstatement of community services and infrastructures	Compensate or reinstate/relocate community assets that are disturbed such as irrigation canals, electricity poles, telephone lines, drinking water pipes, sewerage lines, roads, etc. to the satisfaction of the people. Coordinate with concerned utilities, local people, design maps of the area with utilities and emergency response plans (develop and include an emergency response plan/template that includes notification and reporting protocols)	- Compensation has been distributed to project affected people and community
	Influx of outside workforce, money, and unwanted activities.	Increase in crime and community stress	Prohibit gambling and alcohol consumption in contractors' camp sites. Instruct the workforce to respect the local cultures, traditions, rights, etc. Provide security in contractors' camps.	- No any case of gambling and alcohol is recorded. - No well security at labor camp. No proper locking system at door.
	Project activities relating to health and safety issues at work areas	Health and hygiene (unsafe working conditions, accidents, fire hazard, transmission of communicable diseases, etc.)	Provide regular health checkups, sanitation and hygiene, health care, and control of epidemic diseases to the workforce. Launch awareness programs concerning human trafficking and the possibility of spread of sexually transmitted diseases (STDs) and HIV/AIDS using brochures, posters, and signboards. Provide insurance to workers and training in occupational health and safety. Give importance to community health and safety: <ul style="list-style-type: none"> Provide alternate potable water supply during maintenance works and notify the public in advance Prevent pollution of air in agricultural land, vegetation, and human settlements due to dust and vehicular emissions. Avoid wastewater pollution on land, humans, receiving waters, and the environment. Minimize nuisance due to traffic noise and vibrations. Prevent nuisance from odors and noise from wastewater treatment plants. Avoid traffic accidents and traffic jams. 	- No any means of regular health checkups, sanitation and hygiene to the workforce. - No any awareness program is conducted in relation to human trafficking and possibility of spread of sexually transmitted diseases (STDs) and HIV/AIDS using brochures, posters, and signboards. - Jar water is provided for drinking at entire visited site. - First aid kit was seen on most of visited site but not with complete list of materials. But no provision of ambulance and fire extinguishers. - PPE is provided to all workers.

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Project Stage	Project Activity	Potential Environmental Impacts in IEE	Proposed Mitigation Measures in IEE	Remarks
			<p>prevent the possibility of accidents to the people of the community due to trench excavations.</p> <p>Make available first aid kits, ambulance and fire extinguishers in camp sites.</p> <p>Make available protection gears to all construction workers and compensate for the loss of life or any type of injuries.</p>	
		Injury to a member of the public during pipe delivery	<p>Provide fencing and/or barricades as per site risk assessment. Apply signage and pedestrian control.</p> <p>Devise and implement system for site inspection and security.</p> <p>Ensure security and equipment necessary to minimise vandalism.</p>	<p>- Green net is used not effectively and properly. The used green net is not 1 m height that must be tightened either to a bamboo pole or to iron poles which shall be installed at least 1.5m distance from the edge of excavation or as local condition required.</p> <p>- Only mounted work on progress board but no display of updated project description board on any site.</p>
		Traffic can cause personal injury to the public, contractors, and employees; and vehicle accidents.	Develop a traffic control plan and keep areas clean and clear of obstacles.	No traffic disruption along the sewer alignment.
		Slips, trips and falls, strains and sprains; manual handling of injuries such as back damage	Conduct site inspection to ensure access/space is adequate for the task activities.	Access is adequate for the task activities.
		Existing underground services can cause explosion, electrocution, and damage	<p>Inform site in-charge before digging/excavation; check relevant authority (e.g. power, water, telephone) records for existing location of services.</p> <p>If in doubt use the experienced service of people in the locality.</p>	- Availability of authorized representative of contractor at work site (Engineer/Supervisor)
		Excavation by plant and equipment will create noise, falling objects, damage to existing surfaces, material spillage, and injuries by moving parts.	<p>Operations of plant by licensed personnel. Use personal protective equipment—hardhat, high visibility vest, hearing protection etc.</p> <p>Maintain a safety working area clear of any clutter etc. Around the moving plant.</p> <p>Protect surfaces from plant movements. Ensure plant noise control. Maintain cleanup equipment on site.</p> <p>Maintain (specified) spillage control equipment.</p> <p>Employ observers where possible.</p>	<p>- Workers exposed wearing PPE correctively at most of monitored sites.</p> <p>- No designated area for housekeeping at working area. But it is maintain on camp site.</p> <p>- Contractors check is machinery equipment intermittently not regularly.</p> <p>- No fitting mufflers on vehicle.</p> <p>- No air muff/plug/cotton has been provided to any workers.</p>
		Falling objects during storage of materials during excavation.	No materials to be placed or stacked near the edge of any excavation.	- Green net is in used but not complying standards.

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Project Stage	Project Activity	Potential Environmental Impacts in IEE	Proposed Mitigation Measures in IEE	Remarks
			No load to be placed or moved near the edge of the excavation where it is likely to cause collapse of side of work. No load handling/movement across excavation. No rollable objects stored uphill from excavation.	- Excavated material pile safely without earth falling on few sites.
		Overhead and underground power cables can cause electrocution during excavation.	Determine location of underground services. If underground power cables are located in the vicinity, exercise extreme care while excavating. Consider any restriction on kinds of tools and equipment that may be required and comply with the requirements. Liaise with relevant authority.	Coordinating with Nepal Electricity Authority (NEA) and Telecom team sometimes as per required.
		Sloping ground can cause the falling of rolling objects.	Maintain good housekeeping (remove debris, trip hazards, site tidiness). Select locations to minimize potential for movement. Stack materials at level below excavation. Secure/retain potential falling/rolling objects.	- No specified area for housekeeping in vicinity of worksite. It's only visible at campsite.
		Trench collapse and falling objects.	Support / bench / batter excavation. Keep safe distance from edge of trench (at least 0.6 m away from sides of trench depending on soil type and conditions to be decided by DSC during detailed design and to be barricade/fenced to debar the public). Materials not to be placed or stacked near the edge of trench. No load to be placed or moved near the edge of trench where it is likely to cause collapse of the trench. All trenches to have safety barricades when left open for a period of time.	- Shoring is not done on any site. - Though barricading is done for unattended work but not done effectively. - Excavated material piled safely only on few visited sites.
			Provide submersible pump to dewater trenches where ground is water-charged. Use personal protective equipment. No load/personnel movement across trench.	- Significant use of PPE by labors which is encouraging. - Submersible pump is used as per need to dewater trenches.
		Falling into trenches	Install a shoring system. Where possible backfill trenches. Erect 1.8 metre (min) security fence if open excavation is to be left unattended or cover open excavation with steel plating if left unattended. No personnel movement across trench.	- No use of shoring. - Most of site has done well graded backfilling whereas backfilling is not seeming so satisfactory on other sites. - Barricading is done but not properly and effectively.
		Other risks associated with confined spaces such as gases etc.	Where trench/conduit is considered to be a confined space, use experienced trained personnel. No smoking and use of mobile phone use and avoid sparking.	

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Project Stage	Project Activity	Potential Environmental Impacts in IEE	Proposed Mitigation Measures in IEE	Remarks
		Trip hazard; dust-eye injury; environmental damage due to storage of fill.	Provide necessary environmental protection measures: Secure fill stockpile. Provide a dedicated area for fill. Watering of material. Provide necessary personal protective equipment to workers. Cover /fill when unattended or unable to be watered.	<ul style="list-style-type: none"> - Workers wearing PPE. - Backfilling is done. - Barricading for unattended work but not effectively
		Manual handling (shovelling) can cause strains and sprains, injuries such as back damage, injuries due to lifting pipes and swinging loads	Correct manual handling techniques. Provide adequate rest periods, allowed job rotation, minimize repetitious twisting and shovelling. Use mechanical aids where possible. Maintain control of loads when lifting and moving. Carry pipes close to ground while moving if mechanical aid is used.	<ul style="list-style-type: none"> - Using wheel barrow when lifting and moving. - No tool box talk is in practice yet all particularly on Manual handling.
		Contaminated soil can cause impact on health of persons.	Use protective clothes/shoes/gloves.	Workers wearing PPE
		Defective materials can cause injuries	Visual inspection of materials by experienced persons.	Routine inspection but not frequent.
		Storage of hazardous materials can cause injuries and illnesses.	Handling and storage to be done carefully under guidance.	<ul style="list-style-type: none"> - No designed area at worksite only at campsite. - No any toolbox talk on regarding manual handling.
		Earth mounds can cause engulfment and dust can cause eye injuries.	Control operation of mobile plant by competent person. Watering of material. Control slopes. Delineate earth mounds. Put up warning signage. Cover earth mounds when unattended or unable to be watered.	Mobile plants operated in controlled manner.
		Personal injury due to working plant and equipment.	Maintain a safe distance from working plant. Wear personal protective equipment including high visibility clothing and hard hat, etc. Put up perimeter fencing Place trained personnel on the look-out. Have a first aid kit at the site.	<ul style="list-style-type: none"> - First aid box is available but not with complete list of materials. - PPE is used correctively. - Fencing is done but not seems effective.
		Public hazards due to inadequate compaction, construction refuse, and inadequate re-surfacing during site restoration.	Compaction to specified international standard (backfill shall be compacted to a dry density of not less than 90% of the maximum dry density); clear site of debris and refuse; re-surface without leaving gaps or uneven surfaces and erect fence around hazardous areas until they are safe and restored.	<ul style="list-style-type: none"> - Backfilling followed by compaction is done properly on few sites. - Site clearance and removal of excess debris seems good only on few visited sites.

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Project Stage	Project Activity	Potential Environmental Impacts in IEE	Proposed Mitigation Measures in IEE	Remarks
		Inadequate training, consultation, planning and improvisation can cause task-specific injuries due to inexperience, inadequate consultation or failure to provide required equipment.	All personnel on-site should be trained and kept aware, and should be suitably qualified. Provide competent supervision to be on-site.	No any tool box is in practice yet all regarding safety.
		Weather conditions (e.g. hot, cold, wet, flooding/inundation, high winds) can cause dehydration and dizziness.	Supply adequate drinking water in the work area.	Potable drinking water is provided adequately.
		Slippery surfaces can cause slips and falls.	Wear non-slip safety footwear in all work sites. Ensure extreme care when working in wet and slippery areas. Personnel should never run on worksite.	Workers wearing safety boots properly on most of sites.
		Untidy site can cause slips and fall, particularly when site is unattended.	Keep worksite clean and tidy at all times, free from clutter and rubbish. Store materials in designated areas as specified in site plans	Site clearance is done satisfactorily only on few sites.
		Public safety make be at risk due to pipes or drums accidentally rolling onto the roadway causing an accident or may be rolled by unauthorized persons particularly when site is unattended causing injury to persons.	All materials to be secured by blocks or wedges, sandbags or other means. All pipes not laid during the course of a day are to be returned to the stockpile and secured.	<ul style="list-style-type: none"> - No dedicated area for store at worksite but visible only at campsite. - Construction materials (pipe, net, board) left over randomly around construction site on some site.
		Public safety may be at risk due to improper storage of plant.	Store/park plant and equipment off site and in a secure area.	Stock piling in secure area.
		Nuisance due to excavated soil. Deterioration of air quality due to dust.	Provide for safe disposal and re-use of excavated soil. Remove waste soil as soon as it is excavated. Sprinkle water to avoid dust.	<ul style="list-style-type: none"> - Excavated soil is not covered and moisturize. - No water sprinkle is in practice.
		Soil erosion, silt runoff, and settling of street surfaces. Water could get polluted, land values degraded and be a nuisance to pedestrians. Street surfaces would settle,	Precautionary measures should be taken during construction such as backfilling of excavated trenches. Construction activities should be, as far as possible and avoided during the rainy season. Provide temporary diversions and sign boards for pedestrians.	Display of work on progress board and road diversion board but updated project description board is lacking.

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Project Stage	Project Activity	Potential Environmental Impacts in IEE	Proposed Mitigation Measures in IEE	Remarks
		bringing about ponding of water.		
		Local residents and sites of social/cultural importance may be disturbed by noise, dust and impede access	Carry out the work as quickly as possible to minimize disturbances. Consult residents; inform them of work in advance. Erect "work to commence" and "work in progress" signage.	Signage boards are in place. Contractor is instructed to place more signage boards.
		Pollution of water distributed can cause health hazards.	Place water distribution pipes away from sewers to avoid infiltration of sewage (the bottom of the water service pipe must be at least 0.3 m above the top of the sewer line to avoid seepage with the water pipe above the sewer)	Water distribution pipes are in safer distance.
	Dislocation of archaeological artifacts, if any	Loss of archaeological and cultural sites Finding of any archaeological artifact during excavation works.	Protect archaeological and cultural sites, use manual digging, and avoid heavy equipment during the digging of trenches for the laying of pipes in sensitive areas. Inform the Chief District Officer who has to report the findings in writing to the Department of Archaeology within 35 days, according to the Ancient Monuments Protection Act, 1956 and Rules, 1989.	- Manual handling is in practice to protect archaeological and cultural sites. - Coordination is done when required.
			Arrange for onsite "grievance handling" through the use of liaison officers. Undertake trench closure and facilitate surface rehabilitation or paving as quickly as feasible.	- Grievance register is maintained on most of visited site to cover more grievances from the local community schools, ward for recording there any grievance caused due to pipe laying works.

Table 4-4: Environmental monitoring indicators and status for IS-02

Environmental Impact	Mitigating Measures	Parameters to be monitored	Measurements	Location	Date and person	Remarks
Job opportunity	Employ local people (not under age 16). Settle wage rate based on DWEC and provide the list of employees to DSC	Number of local person employed, number of under-aged people employed. Whether the wage rate is at par with DWEC	List of employees, nationality, age of employees, wages	Project Site	Er. Sagun Dangol (June 27, 2018)	<ul style="list-style-type: none"> Employees are of Nepali and Indian nationality and are not under age.
Change in Hydrology and Morphology of streams and rivers	Quarrying/mining activities in river/streams for extraction of construction materials shall not be done so as to change the river cross sections and longitudinal profile	Cross sections of river before construction and during construction upstream (at the quarry site, upstream and downstream) and river discharge	Cross-section of the river; Visual inspection; Discussion with locals, discharge measurements and photographs before and during construction	Quarrying/mining sites in river course	Er. Sagun Dangol (June 27, 2018)	<ul style="list-style-type: none"> Government have already demarked river width Manohara land pooling area have some legal problem (thus work is stopped in this area)
Soil erosion and slope stabilization	<ul style="list-style-type: none"> Separate stockpiling of topsoil for further use; Spoil disposal at 	<ul style="list-style-type: none"> Drainages systems 	<ul style="list-style-type: none"> Site drawing showing drainage system in 	Project Site	Er. Sagun Dangol (June 27, 2018)	<ul style="list-style-type: none"> Stock pilings have been done in specific area

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Environmental Impact	Mitigating Measures	Parameters to be monitored	Measurements	Location	Date and person	Remarks
	<p>designated and stabilized sites; Excavated areas' backfill to be compacted and include replacement of topsoil; Avoid work during the rainy season as much as possible; Mulching to stabilize exposed areas; Use bioengineering techniques (e.g. re-vegetating areas promptly); Provide channels and ditches for post-construction flows; Lining of steep channels and slopes (e.g. use of jute matting); Prevent off-site sediment transport using settlement ponds, silt fences.</p> <ul style="list-style-type: none"> • Use of settling basins at reservoir sites; use of straw for filtering of small discharges; routine inspection and monitoring of larger discharges to water courses. • Use of temporary bunds; use of catchment basins below steep reservoir sites. • Construction to be done in the dry season only; use of river diversions with bundings; Local wells and springs to be bunded from temporary spoil dumps; local wells and spring fed spouts or kuwas to be monitored particularly downhill of excavations plus temporary supply provided if flow is affected; permeable base and side backfill required at deeply excavated reservoir sites or an alternate source of drinking water provided at the existing location. 	<ul style="list-style-type: none"> • Stockpiling of top soil for its re - use • Bio-engineering measures • Management of excessive spoil materials 	<p>project sites. Visual inspections, photographs and the local peoples' views if excavation and other site works have caused soil erosion; stockpiling of excavated soils have been done or not (logbook on transportation of excess spoil materials from the site); whether spoils have been disposed in approved areas or not and whether the contractors have taken mitigation measures or not (site planning areas for disposal)</p> <ul style="list-style-type: none"> • Number of trees or sapling planted • Site operations logbook (to determine if construction work is being carried out in the wet or dry season). Log book of water delivery to people being served 			<ul style="list-style-type: none"> • In Jadibuti, stockpiling is disposed in the area as designated by locals. • In Pepsicola, stockpiling is disposed in the same area • In Kodku, stockpiling is disposed in out skirt area. • Tree cutting have not been found in the month of June 2018

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Environmental Impact	Mitigating Measures	Parameters to be monitored	Measurements	Location	Date and person	Remarks
Water pollution	<ul style="list-style-type: none"> • Avoid camping facilities within clear water supply rivers • Provide designated areas with collection bins for waste. • Provide safe toilets and septic tanks in site • Prohibit open defecation in open areas. • Storage of construction aggregates, hazardous, and toxic materials in safe areas and disposal of chemical containers, packaging materials, plastic bags etc. • Prohibit washing of vehicles next to rivers and streams. • Provide training to workforce on safe handling of toxic materials and OHS measures during construction. • Recover used oil and lubricants and reuse or remove from the sites. Storage areas for fuels and lubricants should be away from any drainage leading to water bodies. All fuels use areas e.g. generators must have drip basins installed to prevent any leakages and recycled. All fuelling, repairing and maintenance work should be done on a concrete surface provided with a catch tank that can be cleaned and all spilled fuel recovered and recycled. 	<ul style="list-style-type: none"> • Water quality and health status of workers before and after during Construction. • Site plan of camp facilities showing nearby receptors, toilet facilities/ablution blocks. • Site plan showing designated storage areas, list of chemicals on site; prohibition/restrictive signage at the construction sites • OHS training plan and material safety data sheets (MSDS) on site at all times. • Oil and lubricants spill prevention measures 	<ul style="list-style-type: none"> • Baseline water quality of receiving water (complete physical, chemical and bacteriological tests). • Inspection of site plans, distance of camping facility from drainage area (at least 100m); number of toilets/ablution blocks provided; audit of training plan, inspection of signage and MSDS, health/clinic reports of workers. • Observation of fuelling and generator areas 	Streams and rivers, Project site and camps Streams and rivers, Project site and camps	Er. Sagun Dangol (June 27, 2018)	<ul style="list-style-type: none"> • Drinking water quality test is not done, which is provided to labors during working periods • Adequate distance (100m) of labor camp is maintained from drainage area • Three toilets are being provided for labors (1:15)
Air Quality	<ul style="list-style-type: none"> • Dust suppression on roads or at open sites by sprinkling water as required at regular intervals. • Cover earth stockpiles using plastic sheets or cement jute bags. 	<ul style="list-style-type: none"> • Operation of dust suppression tanks, sprinklers on site • Stockpiles covered with appropriate sheeting. 	<ul style="list-style-type: none"> • Visual inspection if water is sprinkled or not; logbook of operation of dust suppression trucks. • Photographs of stockpiles, visual inspection reports 	Project location	Er. Sagun Dangol (June 27, 2018)	<ul style="list-style-type: none"> • Sprinkling of water is not required as monsoon is prevailing and work related to dust generation is not in existence

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Environmental Impact	Mitigating Measures	Parameters to be monitored	Measurements	Location	Date and person	Remarks
	<ul style="list-style-type: none"> Limit vehicle speed. See that vehicles comply with the National Vehicle Mass Emission Standards, 2056 BS. Regular maintenance of vehicles. Provide proper ventilation in confined working areas 	<ul style="list-style-type: none"> Vehicle maintenance records; renewal of "green stickers". Ventilators in confined spaces 	<ul style="list-style-type: none"> Check maintenance records and "green stickers". An inspection report of site plans and number of ventilators (meets international standards). Site drawings showing location of ventilators, number of ventilators 			
Noise Level and vibration	<ul style="list-style-type: none"> Monitoring of noise levels regularly at site. Fit mufflers in vehicles to control noise. Limit the speed s of vehicles. Ban the use of power horns in vehicles. Regular maintenance of equipment. Prohibit the operation of crushing plants and construction vehicles between 7 PM to 6 AM. Compensate the damages caused by vibrations. 	<ul style="list-style-type: none"> Baseline noise level Adoption of noise level control measures as specified; Vehicles with mufflers installed or not; speed limit signage erected; maintenance schedule of equipment; operation log of crushing plants. Nearby structures/buildings in construction areas. 	Sound level (dBA); feedback/complaints from nearby residents; number of vehicles installed with mufflers; number of vehicles with/without power horn; number of speed limit signage at the project site; inspection reports/photographs of nearby buildings/structures for cracks before/during construction	Project site	Er. Sagun Dangol (June 27, 2018)	<ul style="list-style-type: none"> Noise/vibration generated from vehicles have insignificant impact, due to short term use of vehicles and are site specific. Thus, no any complaints from nearby residents have been recorded.
Waste Management	<ul style="list-style-type: none"> Store all materials, toxic, non-toxic and hazardous materials in safe place (warehouse). Collect, segregate and dispose waste at designated areas 	<ul style="list-style-type: none"> Waste Management Plan Log book of collection and disposal of waste from the site 	<ul style="list-style-type: none"> Check amount of solid waste generated and if solid waste management is carried out efficiently. Audit of waste management plans; inspection of disposal areas/site plan drawings, photographs etc. 	Project site	Er. Sagun Dangol (June 27, 2018)	<ul style="list-style-type: none"> Waste management plan and log-book for waste management is not maintained Waste is collected at a place at labor camp and disposed to municipality waste carrying vehicles Contractor has established new labour camp at lamdole. Contractor is willing to provide potable water supply and maintain proper sanitation with the establishment of soak pit toilets.

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Environmental Impact	Mitigating Measures	Parameters to be monitored	Measurements	Location	Date and person	Remarks
Vegetation Clearance	<ul style="list-style-type: none"> • Provide LPG/kerosene to workforce. • Stockpile the felled trees and take permission from concerned authority for its use. • Plant and rear tree saplings at the rate of 25 saplings for each felled tree. 	<ul style="list-style-type: none"> • Cutting of only the specified and marked trees; use of timber and wood; availability of LPG/kerosene; plantation @ 25 tree saplings per cut tree. • Permits for tree felling and its use 	<ul style="list-style-type: none"> • Check records of trees cut and planted; whether LPG/kerosene is available in camp sites. • Photographs, expiry date of permits and number of permits etc. 	Project site	Er. Sagun Dangol (June 27, 2018)	<ul style="list-style-type: none"> • Tree cutting have not been found in the month of June 2018
Damaged Infrastructures and services	Reinstate/relocate community assets that are disturbed such as irrigation canals, electricity poles, telephone lines, drinking water pipes, sewerage lines, roads, etc. to the standard as before and /or better.	Reinstatement of structurally damaged infrastructures like temples, bridges, irrigation channel, electricity poles, telephone lines, drinking water pipes, sewer, access roads, cracks in buildings etc.	<ul style="list-style-type: none"> • Field observation to visually assess if disturbed community assets are reinstated. • Design drawings and technical specifications showing areas for potential reinstatement, photographs before and after construction in sensitive areas etc.; emergency response plans 	Project site	Once construction in the area is over	<ul style="list-style-type: none"> • Due to project activities, infrastructures and services have not been damaged rather only some of the utilities were damaged and were reinstated again. • Existing drainage pipe was damaged in Pepsi-cola site and was reinstated again as reported in the field status of this month. • There was displacement of utilities from MR275-MR270 and was reinstated again.
Crime and community stress	<ul style="list-style-type: none"> • Prohibit gambling and alcohol consumption in camp sites • Instruct the outside workforce to respect the local cultures, traditions, rights etc. • Provide security in camps 	<ul style="list-style-type: none"> • Situation of social disharmony • Awareness program • Workers/ staff conduct policy 	<ul style="list-style-type: none"> • Crime records and causes; camp issues; • Enforcement of remedies; security situation in camps. • Audit of staff/workers conduct policy 	Project location	Er. Sagun Dangol (June 27, 2018)	<ul style="list-style-type: none"> • Crime records have not been recorded.
Health and hygiene	<ul style="list-style-type: none"> • Provide regular health check-ups, sanitation and hygiene, training in community health and safety, OHS measures, health care, control of epidemic diseases to the workforce. • Launch awareness programs concerning human trafficking and the possibility of spread of 	<ul style="list-style-type: none"> • The use of safety equipment by workforce. The provision of health measures and training • Awareness programs • Signs and posters • Compensation for health 	Health records; records of outbreak of diseases; maintenance of health clinic; health complaints; number of awareness programs launched; number of person trained.	Project site	Er. Sagun Dangol (June 27, 2018)	<ul style="list-style-type: none"> • Coordination with nearby hospital is done on June 18, 2018 to maintain any emergency health condition, Photo 2

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Environmental Impact	Mitigating Measures	Parameters to be monitored	Measurements	Location	Date and person	Remarks
	STDs and HIV/AIDS using brochures, posters and signboards. <ul style="list-style-type: none"> • Make available first aid kits, ambulance and fire extinguishers in camp sites. 					
Archaeological and cultural heritage sites	<ul style="list-style-type: none"> • Protect archaeological and cultural heritage sites: • In case of relocation, consult the local community • Inform the Chief District Officer (in case of chance finds) who has to report the findings in writing to the Department of Archaeology within 35 days, according to Ancient Monuments Protection Act, 1956 and Rules, 1989. • Use manual labor for digging trenches and avoid heavy equipment and pneumatic drills. 	<ul style="list-style-type: none"> • Surveys and discussion with local residents and community • Notification to CDO and Department of Archaeology before works are to begin • Availability of workers and equipment to undertake the works 	<ul style="list-style-type: none"> • Field observation of archaeological and cultural sites and number of chance finds to authorities. Number of notifications sent and meeting minutes/letter of correspondence • Design and technical specification documents specifying requirements. • Number of workers available etc. 	Project site	Er. Sagun Dangol (June 27, 2018)	<ul style="list-style-type: none"> • Project alignment does not pass through any archaeological and cultural heritage site.
Traffic Management	<ul style="list-style-type: none"> • Develop a traffic plan to minimize traffic flow interference from construction activities • Advance local public notification of construction activities, schedule, routing and affected areas including road closures. • Erect signage in Nepali and English languages. • Use of steel plates or other temporary across trench facilities in key areas such as foot trails or livestock routes; arrange for pedestrian access and sidewalks and parking areas. • Arrange for night time construction for activities in 	<ul style="list-style-type: none"> • Working schedules and traffic plans. • Information about construction schedule to the local people 	Visual observation of traffic; complaints from travelers and locals; existence of signage and effectiveness of speed control and diversion measures.	Project Site	Er. Sagun Dangol (June 27, 2018)	<ul style="list-style-type: none"> • As the alignment is located along the river bank, there is minimal flow of vehicles and no traffic problems. Signage is not maintained properly.

Environmental Impact	Mitigating Measures	Parameters to be monitored	Measurements	Location	Date and person	Remarks
	congested/ heavy day-time traffic areas. • Undertake trench closure and facilitate rehabilitation as quickly as feasible.					

Environmental monitoring indicators and status for IS-03

The ongoing construction work of IS-03 covers about 2 km length of area above the left bank of the Khasang Khusung Khola (Locally called Kasne Khushi). The alignment of the interceptor sewer lies along the recently opened track of Ittapakhe-Miba-Deko town planning area. The monitoring of EMP below is based on the construction area of IS-03.

Table 4-5: Monitoring of Environment Management Plan of IS-03, Khasang Khusung Khola

Project Stage	Project Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Remarks
Construction Phase	Earthworks	Soil erosion and slope instability due to topsoil stripping and excavation for trenches	Separate stockpiling of topsoil from the cultivated land for further use; approximately 30 cm of topsoil from the cultivated land shall be pileup at safer location before excavation for the trench and shall replace after the backfilling along the excavated trench. Compaction of backfill is required and shall include replacement of topsoil all along the cultivated land; adopt cut and fill approach; avoid excavation work during the rainy season.	<ul style="list-style-type: none"> The alignment lies at the recently opened track of Ittapakhe-Miba-Deko town planning area and the work has not been completed. Hence, separate stockpiling of topsoil from cultivated land is not applicable for IS-03 till now. The excavation work normally stops during rainy time. The sewer pipe laying and manhole construction has been stopped from yesterday considering monsoon season. To control soil erosion and slope instability due to excavation for trench and manhole, shoring work has been initiated.
		Surface water discharges to Khasang Kusung and other local drainage from trench construction	Provide channels and ditches for post-construction flows; line steep channels and slopes; do mulching to stabilize exposed areas; use bioengineering techniques (e.g., re-vegetating areas promptly); prevent off-site sediment transport using settlement ponds, silt fences along the alignment where necessary during the time of construction.	<ul style="list-style-type: none"> Provision of channels and distiches for post-construction flows is not in practice The excavated materials have been placed bit far from the edge of the excavation to about half of the total length of excavated length of the trench. The natural vegetation belt (mostly bush that are of about 1-1.5 m height) present in between the excavated materials and the edge is functioning as a bioengineering.
		Runoff from construction areas including stockpiled materials into natural	Cover stockpiling materials with tarpaulin sheets during rainy season in order to prevent runoff of stockpiling	<ul style="list-style-type: none"> Grading of soil/sand stockpiles has been practiced though coverage of stockpiling materials and

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Project Stage	Project Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Remarks
		drainages and Khasang Kusung.	materials. Grade soil/sand stockpiles to prevent erosion. Construct catchment basins or drainage around the stockpiling area to collect runoff water and drain properly into the natural drainage to avoid runoff of construction materials into water bodies.	<p>construction of catchment basins or drainage around the stockpiling area is not in practice.</p> <ul style="list-style-type: none"> The stockpiles of sand are normally deposited the sides of the track while the stockpiles of cement are stored at the labour camp.
		Excavation and laying of pipeline/ siphons, aqueduct and overflow wire at river crossings could impact the river water quality and ecosystem	Carry out construction during the dry season only; maintain flow of natural drainages and maintain bank of such drainages meeting to Khasang Khusung.	The construction work normally stops during rainy time.
		Interception and interference with localized groundwater flows due to deep excavations.	Avoid deep excavation for the trench as far as possible. Monitor local wells and spring fed spouts or kuwas if identified during the time of construction and excavation of trench. Relocate such infrastructure consulting with locals and its belongings if possible with minimal cost. Consult with DSC to settle such unforeseen issues requiring further variation.	Within the construction area, there is almost no natural water-body/drainage but the artificial wetlands that are formed in the area between the walls of the opened tracks. It is to be noted that number of water sources such as spring fed spout (Kuwa), stone spout is located bit far from the construction site.
	Back filling and Disposal of excavated material	Water and land pollution	Excavated material shall be managed within the construction site avoiding contamination to water bodies. Direct disposal of excavated material and spoil into the Khasang Khusung shall be avoided. Excavated material shall be backfilled into the trench with proper compaction. Other excess excavated materials shall be overlay on the top along the alignment maintaining landscape and slope to drain surface runoff properly. Any soil humps of the excavated material shall not be remained at the construction site after the compaction.	Currently, the excavated materials are deposited at the edge of the excavated trench. Direct disposal of excavated material and spoil into the khola have been completely avoided. However, the excavated material from the masonry wall trench has been deposited at the left bank of the Khola at one point to the length of about 10 m. They are already instructed to adopt the corrective measure and they have agreed to correct it.
	Quarrying from river bed	Change in river hydrology and morphology	Prohibit quarrying/mining activities in river/streams to extract construction materials throughout the Khasang Kusung River. Quarry site shall be environmentally safe and has acquired environmental permits such as IEE from the concern ministry prior to the excavation.	No quarrying work has been done from the Khola.
Construction Phase	Stock piling of construction materials	Water and land pollution	Ensure site is well-signed indicating the restrictions and construction activities including sign of safety. Store construction aggregates, hazardous and toxic materials, lubricating, oils and used batteries in safe areas and away from any drainage leading to water bodies; have designated bounded areas for storage.	<ul style="list-style-type: none"> The three types of signage available at the construction sites include the signboard with basic information about the construction work, signage about the traffic alternative route and project information board. It is noteworthy that proper placement and the maintenance

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Project Stage	Project Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Remarks
	Handling of toxic materials		<p>Prohibit washing of vehicles along the bank of Khasang Kusung River.</p> <p>Avoid storing of construction aggregates, hazardous and toxic materials, lubricating, oils and used batteries near the premises of water bodies and Kali Ghat Cremation Site.</p> <p>Provide training to workforce on safe handling of toxic materials and occupational health and safety measures during construction.</p> <p>Use personal protective equipment at all times while on site. Stock piling shall be carried out at open spaces. Contractor shall solicit consent from the land owner if it is on the private land.</p>	<p>of the former two signage is not satisfactory for which regular monitoring and their maintenance if any is a must.</p> <ul style="list-style-type: none"> There is no provision of designated bounded area for storing the hazardous and toxic materials, lubricating, oils and used batteries. Washing of vehicles along the bank of the khola is completely prohibited. Till now, workforce got a number of trainings on occupational health and safety measures but they have not got any training on safe handling of toxic materials Use PPEs is maintained by about 75% of the workers at all times while on site. Stock piling has been done at one side of the opened track.
	Stock piling of 700mm Hume pipes, iron and steel bars and other construction materials	Local disturbance, difficult in mobilization of locals and traffic	<p>Practice good housekeeping for the storing of materials. Construction materials shall not be stored near the settlements and along the existing road sides disturbing mobility and traffic. Transportation of such goods shall be avoided during office hours.</p> <p>Stock piling shall be carried out at open spaces. Contractor shall solicit consent from the land owner if it is on the private land.</p>	<p>The huge stock of gravel is stored at the open place and cements are stored in the labour camp. Other construction materials including sand, stone, hume pipes are stored at the side of the road. The road has relatively less traffic and less mobility of people because the area around the construction area comprises only a couple of brick industry and scattered settlements. Located in the recently opened track, there is no any human settlement along the alignment in the construction area. And the transportation of construction materials has not been avoided during office hours</p>
	Movement of vehicles carrying construction materials	Air quality deterioration	<p>Dust suppression on roads or at open sites by sprinkling water as required at regular intervals. Cover earth stockpiles using plastic sheets or cement jute bags. Use tarpaulins to cover sand and other loose materials during transport. Cover stockpiling materials with tarpaulin sheets during rainy and windy season in order to prevent runoff and erosion of stockpiling materials.</p> <p>Limit speed to 10-15 km/hr for construction vehicles; site to be signed specifying speed limits. Ensure that vehicles comply with the National Vehicle Mass Emission Standards, 2056 BS. Do regular maintenance of vehicles.</p>	<ul style="list-style-type: none"> Dust suppression on road or at open sites by sprinkling water has not been done because dust pollution is insignificant in the construction area, given the monsoon season. There is no practice of covering the stockpiling materials however they are covered during transportation. The stockpiles of gravel, earth, and sand are stored at the side of road where there is enough broad area and cement area stored at the camp.

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Project Stage	Project Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Remarks
				<ul style="list-style-type: none"> The construction vehicles have maintained the speed of 10-15 km/hr though; there is no sign of speed limits. There is a practice of regular maintenance of vehicles.
	Operation of Labour Camps	Land and water pollution	<p>Provide designated areas for the establishment of labour camps with collection bins for wastes. Labour camps shall be established only at the public open spaces as far as possible without disturbing any existing environmental condition. Avoid disturbance to vegetation during the establishment of camp. Labour camps shall not be established on private lands without consent of landowners.</p> <p>Provide toilet facilities around the labour camp area and prohibit open defecation and direct disposal of toilet and kitchen wastes around the construction site and all along the bank of Khasang Kusung.</p> <p>Prohibit establishment of labour camps near the premises of Kali Ghat Cremation Site and other settlement areas situated near by the river alignment.</p> <p>Potable water shall be supply regularly to the labour camp.</p> <p>Provide separate camps for men and women labours.</p> <p>Temporary shoke-pit shall be constructed for the dispose of toilet waste established near camps; all the camp area including pits shall be reclaimed and rehabilitated after the completion of work.</p> <p>Make available first aid kits, ambulance and fire extinguishers in camp sites.</p> <p>Provide good lighting systems and communication system including security in labour camps.</p> <p>Avoid brawl and disturbance to local community at the vicinity of camps.</p>	<ul style="list-style-type: none"> There are altogether 3 labour camps; one permanent and two temporary, in the construction site. The permanent labour camp is provided with bin for waste and the rest two are devoid of the bin. The degradable kitchen waste is disposed by digging a pit and refilling it. Direct disposal of non-degradable kitchen wastes around the construction site and all along the bank of the Khola is avoided as far as possible. However, there is no proper management system for that. Similarly, the former camp has separate toilet facility for male and female with septic tank while the later camps lack the toilet facility. Given the distance between permanent camp and the temporary camps, there is a possibility of open defecation. All of them are established on the public land by removing the bushy vegetation of common species. The supply of potable water to the labour is not regularly maintained. Since there are no women workers involved, there is no provision of separate camps for women. Temporary shoke-pit is available at the permanent camp only. The first aid kits are available at the permanent camp and JCB only. here is no first aid box in the rest labour camps. They have tried to provide the emergency number of hospital and ambulance to the labours. Fire extinguishers are not available in camp sites but advised to place in kitchen room and they have agreed to make available soon. They have provided basic lighting systems and communication system including security in labour camps.

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Project Stage	Project Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Remarks
				<ul style="list-style-type: none"> Brawl and disturbance to local community at the vicinity of camps has been completely avoided.
	Operation of crusher	Noise and vibration	<p>Contractor if establish crusher; shall not be operated during the off hours (night time from 6pm to 8am). Crusher shall be established at least 800meter away from the settlement areas.</p> <p>The operation of crusher shall not exceed the National Noise Standard 2069 established for mixed residential area i.e. 63 db.</p>	<ul style="list-style-type: none"> Crusher has not been used in the construction site. Power horns have been avoided in the construction vehicle and they have maintained the speed of 10-15 km/hr. The unnecessary running of vehicles, equipment and machines at the construction sites is avoided as far as possible. Parking of construction vehicles is avoided on private land but along the existing road sides in such a way that there is minimum disturbance to the local traffic.
	Movement of vehicles related to crusher and carrying aggregates		<p>Avoid power horns in construction vehicles to reduce noise.</p> <p>Limit the speed of vehicles to 10-15 km/hr. Avoid unnecessary running of vehicles, equipments and machines at the construction and crusher sites.</p> <p>Avoid parking of construction vehicles on private land and along the existing road sides disturbing local traffic.</p>	
	Operation of excavator and concrete mix plant	Air, Noise, Accidents and other hazards.	<p>Operate excavator and concrete mix plant safely. Avoid any accident from the operation. Excavator operator shall wear all the safety gears during operation. Workers working with concrete mix plant shall also wear all personal protective equipment.</p> <p>Concrete mix plant shall be established at least 100 meters away from the water bodies and Khasang Kusung.</p> <p>Concrete mix plant shall not be operated during the off hours (night time from 6pm to 8am).</p> <p>Effluent liquid cements from concrete mix plant shall not be disposed directly into ground and water bodies during operation.</p> <p>All empty cement bags shall be managed properly and shall not remain everywhere all around the project construction site and shall be disposed out of the construction site or reuse as far as possible.</p> <p>Ensure the empty cement bags and plastics including other wastes do not go into the sewerage pipes installed into trench.</p>	<ul style="list-style-type: none"> It is to be noted that there is no any mixing plant, only single bag concrete mixture is in used. Except a high visibility vest, hard helmet, and a mask (infrequent use), the excavator operator rarely wears all the safety gears during operation. Workers working with concrete mixture use most of the PPEs. The construction site for IS-03 is the recently opened track adjoining to the Khasang Khusung Khola and, except the track, there is all the private land of planning. The concrete mixture has been established as far as possible but the distance of 100 m away the Khola may not be reached at many points. The operation of concrete mixture is avoided during the off hours (night time from 6pm to 8am). Using a broad iron base, direct disposal of effluent liquid cements from concrete mixture have not been disposed into ground and water bodies is avoided as far as possible. Empty cement bags are scattered at some points of the construction sites

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Project Stage	Project Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Remarks
				<ul style="list-style-type: none"> The empty cement bags and plastics including other wastes do not go into the sewerage pipes installed into trench.
	Construction and installation of project structures	<p>Likely loss of vegetation/trees due to its clearance especially within the stretch along the Khasang Kusung River during the installation of sewerage pipe.</p> <p>Damages to aquatic ecology of riverbeds and avian habitats.</p>	<p>Cutting trees situated along the Khasang Kusung river bank shall be avoided as the river bank has been protected by the trees growing naturally. Trees growing along the bank shall not be affected during the time of excavation of trench for laying sewer pipes and likely affected trees shall be taken into account.</p> <p>Provide separate water supply for construction works. Avoid utilization of water from Khasang Kusung River and local water resources that has been consuming by the local community. Contractor shall use local water supply only if the water is available plenty.</p>	<ul style="list-style-type: none"> Cutting trees situated along the bank of the Khola is completely avoided. Those trees likely to be affected from the excavation work are taken into account. In spite of great caution, one is affected from the excavation and the compensatory measure for it is under the process. Tank water is provided for most of the construction works. Water from the Khola is sometime noted to use for curing. However, they are instructed to use another source.
	Reinstatement of damaged community services and infrastructures.	Reinstatement of community services and infrastructures	Compensate or reinstate/relocate community assets that are disturbed by the construction work such as electricity poles, telephone lines, drinking water pipes, road lengths etc. to the satisfaction of the people. Coordinate with concerned utilities, local people, design maps of the area with utilities and emergency response plans (develop and include an emergency response plan/template that includes notification and reporting protocols). A Shiva Temple situated at the side of the road at chainage 1+730 near Kali Ghat cremation site diversion shall also be taken into account. Water sprout situated near to the Kali Ghat cremation site shall be taken into account during the time of excavation for trench along the road alignment in the diversion section near Kali Ghat Cremation. Water spout and boundary wall of the water spout shall not be affected with the excavation and installation of sewerage pipes.	<ul style="list-style-type: none"> Located in the recently opened track that is demarcated with wall, the compensation or relocation of disturbed community assets by the construction work is not applicable for IS-03.
	Influx of outside workforce, and unwanted activities.	Increase in crime and community stress	Prohibit gambling and alcohol consumption in labour "camp sites". Instruct the workforce to respect the local cultures, traditions, rights, etc.	<ul style="list-style-type: none"> The unwanted activities such as gambling and alcohol consumption are prohibited in labour "camp sites" as far as possible. The workforce is also instructed to respect the local cultures, traditions, rights, etc.

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Project Stage	Project Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Remarks
	Project activities relating to health and safety issues at work areas	Health and hygiene (Unsafe working conditions, accidents, fire hazard, transmission of communicable diseases, etc.)	<p>Provide regular health checkups, sanitation and hygiene, health care, and control of epidemic diseases to the workforce.</p> <p>Launch awareness programs concerning human trafficking and the possibility of spread of sexually transmitted diseases (STDs) and HIV/AIDS using brochures, posters, and signboards.</p> <p>Provide insurance to workers and training in occupational health and safety.</p> <p>Give importance to community health and safety:</p> <ul style="list-style-type: none"> • Provide alternate potable water supply during maintenance works and notify the public in advance • Prevent pollution of air in agricultural land, vegetation, and human settlements due to dust and vehicular emissions. • Avoid wastewater pollution on land, humans, receiving waters, and the environment. • Minimize nuisance due to traffic noise and vibrations. • Prevent nuisance from odours and noise from wastewater treatment plants. • Avoid traffic accidents and traffic jams. • Prevent the possibility of accidents to the people of the community due to trench excavations. • Make available protection gears to all construction workers and compensate for the loss of life or any type of injuries. 	<ul style="list-style-type: none"> • Health checkups have not been done for labours. • A couple of training has been provided to the safety supervisor, site engineer, ACSE and contractor's representative on occupational health and safety including the issues of Health and safety, nutrition, first aid kit, fire and safety. • No awareness programs have been launch concerning human trafficking and the possibility of spread of STDs and HIV/AIDS. • There is no provision of insurance to workers. • The community health and safety has been considered to some extent.
		Injury to a member of the public during pipe delivery	<p>Provide fencing and/or barricades as per site risk assessment. Apply signage and pedestrian control.</p> <p>Devise and implement system for site inspection and security.</p> <p>Ensure security and equipment necessary to minimise vandalism.</p>	<ul style="list-style-type: none"> • Installation of barricade has been done in most of the opened pipeline trench and manhole area. The signage board has also been installed at several points. However, regular monitoring/inspection and maintenances has remained inadequate.
		Traffic can cause personal injury to the public, contractors, and employees; and vehicle accidents.	Develop a traffic control plan and keep areas clean and clear of obstacles.	<ul style="list-style-type: none"> • Traffic control plan has not been developed • The main road is clean and clear of obstacles though, the muddy road seems not really clean and safe because of continuous movement of vehicle from local

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Project Stage	Project Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Remarks
				brick factory and the JCB that is triggered by frequent monsoon rain event.
		Slips, trips and falls, strains and sprains; manual handling of injuries such as back damage	Conduct site inspection to ensure access/space is adequate for the task activities.	Site inspection is usually conducted to ensure access/space is adequate for the task activities.
		Existing underground services can cause explosion, electrocution, and damage	Inform site in-charge before digging/excavation; check relevant authority (e.g. power, water, telephone) records for existing location of services. If in doubt use the experienced service of people in the locality.	Before starting the construction work, consent has been taken from Bhaktapur Municipality.
		Excavation by plant and equipment will create noise, falling objects, damage to existing surfaces, material spillage, and injuries by moving parts.	Operations of plant by licensed personnel. Use personal protective equipment–hardhat, high visibility vest, hearing protection etc. Maintain a safety working area clear of any clutter etc. Around the moving plant. Protect surfaces from plant movements. Ensure plant noise control. Maintain cleanup equipment on site. Avoid spillage of diesel and other chemicals into the water body and ground. Collect any spillage with sponge material or use sawdust to soak spillage in order to avoid contamination into water bodies. Employ observers where possible.	<ul style="list-style-type: none"> The excavator operator, of age 18, is not eligible for operating heavy vehicle according to the Motor Vehicles and Transport Management Act, 2049 (1993). Except the high visibility vest, hard helmet and a mask (infrequent use), the excavator operator do not use of all the PPE. The working area is normally clean and safe and control of horns has been practiced. The spillage of diesel and other chemicals into the water body and ground has been avoided as far as possible. There has not been observed significant amount of spillage into ground but not into water body.
		Falling objects during storage of materials during excavation.	No materials to be placed or stacked near the edge of any excavation. No load to be placed or moved near the edge of the excavation where it is likely to cause collapse of side of work. No load handling/movement across excavation. No rollable objects stored uphill from excavation.	<ul style="list-style-type: none"> No materials (including rollable objects) has been placed or stacked near the edge of excavation. Load placement or movement near the edge of the excavation where it is likely to cause collapse of side of work is avoided as far as possible. However, there are some points on the road where breadth is short and the continuous movement of excavator is triggering the sides of wall. Such area includes just about 10-20 m, that includes a manhole as well.
		Overhead and underground power cables	Determine location of underground services. If underground power cables are located in the vicinity, exercise extreme care while excavating. Consider any	Not applicable for IS-03.

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Project Stage	Project Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Remarks
		can cause electrocution during excavation.	restriction on kinds of tools and equipment that may be required and comply with the requirements. Liaise with relevant authority.	
		Sloping ground can cause the falling of rolling objects.	Maintain good housekeeping (remove debris, trip hazards, site tidiness). Select locations to minimize potential for movement. Stack materials at level below excavation. Secure/retain potential falling/rolling objects.	<ul style="list-style-type: none"> • Good housekeeping maintained (remove debris, trip hazards, site tidiness). • The stockpiles of stack materials (hume pipes) are placed at one side of the road that is far from the construction work and excavation work.
		Trench collapse and falling objects.	Support / bench / batter excavation. Keep safe distance from edge of trench (at least 0.6 m away from sides of trench depending on soil type and conditions to be decided by DSC during detailed design and to be barricade/fenced to debar the public). Materials not to be placed or stacked near the edge of trench. No load to be placed or moved near the edge of trench where it is likely to cause collapse of the trench. All trenches to have safety barricades when left open for a period of time.	<ul style="list-style-type: none"> • Barricade has been installed, about at least 1-1.5 m away from the sides of trench, in one side only, another side comprises the wall of town planning and hence, only caution tape has been used. • Most often, materials are not placed or stacked near the edge of trench. However, near 2 manholes out of 5, the construction equipment and materials left after the construction work are also placed very near the edge of the trench. • Given the monsoon season, higher proportion of road is completely muddy especially where the JCB have to pass, and hence moving from the side of road is only the alternative. However, moving from near the edge of trench has been avoided as far as possible. • There seems a lack of giving due consideration while placing load near the edge of trench where there is likely to cause collapse. • It occurs occasionally that the condition of all trenches has proper and safety barricades when left open for a period of time.
		Water logging and pounding in the excavated trench and as a mosquito breeding site	Provide submersible pump to dewater trenches where ground is water-charged. Use personal protective equipment. No load/personnel movement across trench. Avoid mosquito breeding in the excavated trench.	<ul style="list-style-type: none"> • Dewatering of manhole is in practice before work but it is not in practice in case of pipeline trench. Given the pre-monsoon and monsoon period, presence of water at the manhole and moist soil (with high water content) at the pipeline is a common problem in the manhole especially at the rainy time.

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Project Stage	Project Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Remarks
				<ul style="list-style-type: none"> Load and personal movement across the trench has been avoided as far as possible. Avoid mosquito breeding in the excavated trench.
		Falling into trenches	Backfill the trenches where possible to avoid falling into it or any accidents. Erect 1.8-meter (min) security fence if open excavation is to be left unattended or cover open excavation with steel plating if left unattended. Erect safety signage boards to prohibit into the area and to avoid personnel movement across trench.	<ul style="list-style-type: none"> Backfilling of the trenches of masonry wall has been done once completed the wall construction work. Backfilling do not apply in the pipeline trench since the leakage test is still remaining. There is no practice of erecting 1.8metre (min) security fence if open excavation is to be left unattended or covering opened excavation with steel plating if left unattended. Safety signage boards has been using to inform about the project and traffic alternative route. However, signage to prohibit and avoid personnel movement across trench is not in practice.
		Other risks associated with confined spaces.	Where trench/conduit is considered to be a confined space, use experienced trained personnel. Labour shall wear all safety PPEs. No smoking and use of mobile phone use and avoid sparking.	<ul style="list-style-type: none"> Where trench/conduit is considered to be a confined space, use experienced trained personnel is in practice Most of the labour wears most of the PPEs. Smoking and use of sparking has been avoided while working in confined area while the use of mobile phone is not.
		Trip hazard; dust-eye injury; environmental damage due to storage of fill.	Provide necessary environmental protection measures: Secure fill stockpile. Provide a dedicated area for fill. Watering of material. Provide necessary personal protective equipment to workers. Cover /fill when unattended or unable to be watered.	<ul style="list-style-type: none"> In addition to the old team, the new team has also started using PPEs. Hence, the provision of necessary PPE to workers is improving. Cover /fill when unattended or unable to be watered is in practice specially at the sides of manhole.
		Manual handling (shovelling) can cause strains and sprains, injuries such as back damage, injuries due to lifting pipes and swinging loads	Correct manual handling techniques. Provide adequate rest periods, allowed job rotation, minimize repetitious twisting and shovelling. Use mechanical aids where possible. Maintain control of loads when lifting and moving. Use Personal Protective Equipment. Carry pipes close to ground while moving if mechanical aid is used.	<ul style="list-style-type: none"> Adequate rest periods, job rotation, minimize repetitious twisting and shoveling are in practice. Use mechanical aids are in practice whenever shoveling work goes for long turn. Control of loads is also in practice when lifting and moving.

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Project Stage	Project Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Remarks
				<ul style="list-style-type: none"> Use of PPEs while shoveling is in practice but has not reached the level of satisfactory.
		Contaminated soil can cause impact on health of persons.	Use protective clothes/shoes/gloves.	<ul style="list-style-type: none"> Most of labour use protective boot, and well covered clothes.
		Defective materials can cause injuries.	Visual inspection of materials by experienced persons/ engineers.	<ul style="list-style-type: none"> Visual inspection of materials including hume pipe is carried out by experienced and professional engineer.
		Storage of hazardous materials can cause injuries and illnesses.	Handling and storage to be done carefully under guidance.	<ul style="list-style-type: none"> Storage of hazardous materials is not practice.
		Earth mounds can cause engulfment and dust can cause eye injuries.	Control operation of excavator and other construction equipment by license holder only. Watering on excavated materials if required during windy season. Control slopes. Avoid earth mounds of the excavated materials as soon as possible. Put up warning signage. Cover earth mounds when unattended or unable to be watered.	<ul style="list-style-type: none"> According to the Motor Vehicles and Transport Management Act, 2049 (1993) of Nepal, the current excavator operator, 18 yrs old, is young for his job. Putting up warning signage and covering earth mounds when unattended or unable to be watered is not in practice in IS-03. However, the uncovered earth has been less nuisance being monsoon season. Further, the vegetation present there also helps to block the dust pollution.
		Personal injury due to working plant and equipment. Injury due to loading, unloading and laying of hume pipes in the trench.	Maintain a safe distance from working plant/ loader. Wear personal protective equipment including high visibility clothing and hard hat, etc. Put up perimeter fencing. Place trained personnel on the look-out. Prevent outside and unauthorized people into the working sites to maintain safety. First aid kit shall be in place at the site.	<ul style="list-style-type: none"> Maintenance of a safe distance from working plant/ loader and the use of PPEs is in practice. Perimeter fencing is not in practice. The trained personnel are placed on the look-out and the entry of outside and unauthorized people into the working sites is prohibited especially during working hour. First aid kit is available at the JCB and permanent camp. However, a separate first aid kit should be in place at the site.
		Public hazards due to inadequate compaction, construction refuse, and inadequate re-surfacing during site restoration.	Compaction to specified international standard (backfill shall be compacted to a dry density of not less than 90% of the maximum dry density); clear site of debris and refuse; re-surface without leaving gaps or uneven	Not applicable to IS-03 for now.

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Project Stage	Project Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Remarks
			surfaces and erect fence around hazardous areas until they are safe and restored.	
		Inadequate training, consultation, planning and improvisation can cause task-specific injuries due to inexperience, inadequate consultation or failure to provide required equipment.	All personnel on-site should be trained and kept aware and should be suitably qualified. Provide competent supervision to be on-site.	<ul style="list-style-type: none"> All personnel on-site are trained and kept aware, and suitably qualified. Similarly, competent supervision is recruited on-site.
		Weather conditions (e.g. hot, cold, wet, flooding/inundation, high winds) can cause dehydration and dizziness.	Supply adequate drinking water in the work area. Make available first aid kit all the time.	<ul style="list-style-type: none"> Supply of adequate potable jar water was having been initiated in the work area. The first aid kit is not available exactly on the construction work site but in the JCB and labour camp.
		Slippery surfaces can cause slips and falls.	Wear non-slip safety footwear in all work sites. Ensure extreme care when working in wet and slippery areas. Personnel should never run on worksite.	<ul style="list-style-type: none"> Most of the labours wear non-slip safety footwear ensuring extreme care while working in wet and slippery areas. Running of the personnel has been prohibited on worksite.
		Untidy site can cause slips and fall, particularly when site is unattended.	Keep worksite clean and tidy at all times, free from clutter and rubbish. Store materials in designated areas as specified in site plans.	Efforts should be increased to maintain the worksite clean and tidy especially at around the manhole. Storing materials in designated areas as specified in site plans has been practiced.
		Public safety make be at risk due to pipes or drums accidentally rolling onto the roadway causing an accident or may be rolled by unauthorised persons particularly when site is unattended causing injury to persons.	All materials to be secured by blocks or wedges, sandbags or other means. All pipes not laid during the course of a day are to be returned to the stockpile and secured.	<ul style="list-style-type: none"> Not in practice. Pipe are laid at the side of road and other secured places.
		Public safety may be at risk due to improper storage of plant.	Store/park plant and equipment off site and in a secure area.	<ul style="list-style-type: none"> Storing/parking plant and equipment off site and in a secure area is in practice but need further improvement.
		Soil erosion, silt runoff, and settling of street surfaces. Water could get polluted; land values	Precautionary measures should be taken during construction such as backfilling of excavated trenches maintaining slope and drainage for surface runoff. Construction activities should be, as far as possible and	<ul style="list-style-type: none"> Backfilling is not applicable for now since they have planned for leakage test soon.

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Project Stage	Project Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Remarks
		degraded and are a nuisance to pedestrians. Street surfaces would settle, bringing about pounding of water.	avoided during the rainy season. Provide temporary diversions and sign boards for pedestrians.	<ul style="list-style-type: none"> Construction activities used to stop during rainy time only. The sewer pipe laying and manhole construction work has been stopped form yesterday (27 June) given the monsoon season. Provision of temporary diversions seems not possible since there is no other way. There is provision of sign boards for pedestrians.
		Local residents and sites of social/cultural importance may be disturbed by noise, dust and impede access	Carry out the work as quickly as possible to minimize disturbances. Consult residents; inform them of work in advance. Erect "work to commence" and "work in progress" signage.	<ul style="list-style-type: none"> Carrying out the work as quickly as possible is practiced everyday There are no residents along the ongoing construction work at the left bank and few residents on the other bank of the Khola. Information board has been available at the site but no practice door to door informing about the work.
		Pollution of water distributed can cause health hazards.	Place water distribution pipes away from sewers to avoid infiltration of sewage (the bottom of the water service pipe must be at least 0.3 m above the top of the sewer line to avoid seepage with the water pipe above the sewer)	Not applicable in IS-03 till now
	Dislocation of archaeological artefacts, if any	Likely impact upon Kali Ghat Cremation site situated along the Khasang Kusung Khola during excavation works.	Protect archaeological and cultural sites, use manual digging, and avoid heavy equipment during the digging of trenches for the laying of pipes in sensitive areas. Inform DSC and to the Chief District Officer who has to report the findings in writing to the Department of Archaeology within 35 days, according to the Ancient Monuments Protection Act, 1956 and Rules, 1989.	Not applicable in IS-03 till now.
		Grievances due to construction	Arrange for onsite "grievance handling" through the use of liaison officers. Undertake trench closure and facilitate surface rehabilitation or paving as quickly as feasible.	<ul style="list-style-type: none"> The grievance handling has been proposed to arrange though the establishment of helpdesk and grievance register but it has not been implemented at the site

Table 4-6: Monitoring of Environment Management Plan (EMP) status update for TP-01

Impacts / Project Activities	Management Plan				
	Mitigating Measures	Parameters to be monitored	Measurements	Frequency	Update Status
CONTRACTORS DESIGN PHASE					
stoppage of existing WWTP	Minimum stoppage planned	Work plan should be properly prepared			EMP updated plan is in place. Work plan prepared and in place.
Soil erosion and slope instability	Incorporate drainage system in final design	Review if detailed drainage systems with plans have been designed			Detail design completed and approved
Sludge disposal	Incorporation of optimum sludge reduction using anaerobic digestion in design for power generation.	Review if designs for sludge management have been made			Centrifuge has been proposed in design to reduce sludge
Health and safety of community and workers	Prepare training manuals in Nepali (or local languages) with notes and sketches on Community Health and Safety and Potential Occupational Health and Safety	Review information for errors and quality			Safety plan is in place. All safety procedure applied. Safety apparels are provided to workers.
Treatment plant inefficiency	Develop and Implement HACCP plans as part of the O&M manuals and provide in Nepali with sketches and regular training to the staff	Operation of plant as per HACCP Plan and O&M Manual. Operational reports (including incidence reports)	Audit of HACCP Plans and O&M manuals (Audit reports) Submission of operational reports		HIRAC carried out twice. No severe impact identified.
Permits and Approval	Obtain required permits and approval for disruption of existing wastewater treatment plant during construction	Ensure work plan such that no disruptions to WWTP are planned			Proponent has acquired permits and approval for the construction of WWTP for High-power Bagmati (HPCIDBC).
Lack of public consultations and awareness programs	Develop and implement a project communications plan to make the stakeholders feel they are part of the project and it belongs to them.	Implementation of communications plan throughout the project. Arrange meetings, workshops and group	Audit of communications plan (Audit reports) Number of meetings, awareness programs held	Bi-annually for the first 2 years of the project then annually in O & M period	

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Impacts / Project Activities	Management Plan				
	Mitigating Measures	Parameters to be monitored	Measurements	Frequency	Update Status
		discussions to disseminate project final designs, plans and activities			
Workforce camps	Establish temporary workforce camps with sanitary amenities at designated sites only	Ensure temporary workforce camps are established within designed area with sanitary facilities and first aid facilities	Visual inspections of wastewater disposal, solid waste management, noise and air pollution, health of workforce, potable drinking water, kerosene availability	Monthly	Camps are established within the project compound. Adequate supply of potable water, toilets, rooms, kitchen etc.
CONSTRUCTION PHASE					
Job opportunity	Employ local people (not under age 16). Settle wage rate based on DWEC and provide the list of employees to DSC	Number of local persons employed, number of under-aged people employed. Whether the wage rate is at par with DWEC	List of employees, nationality, age of employees, wages	During construction every month	All employees are over 16 years of age.
Change in hydrology and morphology of streams and rivers	Quarrying/mining activities in river/streams for extraction of construction materials shall not be done so as to change the river cross sections and longitudinal profiles.	Cross sections of river before construction and during construction upstream (at the quarry site, upstream and downstream) and river discharge	Cross-section of river; Visual inspection, discussion with locals, discharge measurements and photographs before and during construction	During construction every month	No any quarry and mining activity is carried out by contractor at the Bagmati River. Construction materials have been obtaining from private sector situated out of the project area.
Soil erosion and slope stabilization	Separate stockpiling of topsoil for further use; spoil disposal at designated and stabilized sites; excavated areas' backfill to be compacted and include replacement of topsoil; avoid work during the rainy season as much as possible; mulching to stabilize exposed areas; use bioengineering techniques (e.g. re-vegetating areas promptly); provide channels and ditches for post-construction flows; lining of steep channels and slopes (e.g. use of jute matting); prevent off-site sediment transport using settlement ponds, silt fences	Drainages systems Stockpiling of top soil for its re-use Bio-engineering measures Management of excessive spoil materials	Site drawings showing drainage system in project sites. Visual inspections, photographs and the local people's views if excavation and other site works have caused soil erosion; stockpiling of excavated soils have been done or not (logbook on transportation of excess spoil materials from the site); whether spoils have	During construction (Weekly)	Site drawing showing drainage system is available. Stock piling of excavated material is done properly. No significant amount of excavated material generated. About 52 number of trees situated within the WWTP compound has been removed. Contractor are

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Impacts / Project Activities	Management Plan				
Impacts due to	Mitigating Measures	Parameters to be monitored	Measurements	Frequency	Update Status
	<p>Use of settling basins at reservoir sites; use of straw for filtering of small discharges; routine inspection and monitoring of larger discharges to water courses.</p> <p>Use of temporary bunds; use of catchment basins below steep reservoir sites.</p> <p>Construction to be done in the dry season only; use of river diversions with <i>bundings</i>. Local wells and springs to be banded from temporary spoil dumps; local wells and spring fed spouts or kuwas to be monitored particularly downhill of excavations plus temporary supply provided if flow is affected; permeable base and side backfill required at deeply excavated sites or an alternate source of drinking water provided at the existing location.</p>		<p>been disposed in approved areas or not and whether the contractor has taken mitigation measures or not (site plan showing areas for disposal)</p> <p>Number of trees or saplings planted. Site operations log book (to determine if construction works is being carried out in the wet or dry season). Log book of water delivery to people being served.</p>		<p>preparing replantation plan.</p>
Water pollution	<p>Avoid camping facilities within clear water supply rivers</p> <p>Provide designated areas with collection bins for wastes.</p> <p>Provide safe toilets and septic tanks in site</p> <p>Prohibit open defecation in open areas.</p> <p>Storage of construction aggregates, hazardous, and toxic materials in safe areas and disposal of chemical containers, packaging materials, plastic bags etc.</p> <p>Prohibit washing of vehicles next to rivers and streams.</p> <p>Provide training to workforce on safe handling of toxic materials and OHS measures during construction.</p> <p>Recover used oil and lubricants and reuse or remove from the sites. Storage areas for fuels and lubricants should be away from any drainage leading to water bodies. All fuel use areas e.g. generator must have drip basins installed to prevent any leakages and recycled. All fuelling, repairing and maintenance work should be done on a concrete surface provided with a catch tank</p>	<p>Water quality and health status of workers before and during construction.</p> <p>Site plan of camp facilities showing nearby receptors, toilet facilities/ablution blocks.</p> <p>Site plan showing designated storage areas, list of chemicals on site; prohibition/restrictive signage at the construction sites.</p> <p>OHS training plan and material safety data sheets (MSDS) on site at all times</p> <p>Oil and lubricant spill prevention measures</p>	<p>Baseline water quality of receiving water (complete physical, chemical and bacteriological tests). Inspection of site plans, distance of camping facility from drainage areas (at least 100m); number of toilets/ablution blocks provided; audit of training plan, inspection of signage and MSDS, health/clinic reports of workers.</p> <p>Observation of fuelling and generator areas</p>	<p>Once in a month</p>	<p>Adequate potable water has been supplied to the workers and engineers. Collection bins for waste are in place within the construction site. Safe toilets and septic tanks. Separate male and female toilets are available. Safe storage of all construction materials within the project compound. No vehicle washing activity within the project area. Separate storage yard maintained within the project compound. No fuelling, repairing, and maintenance works carried out within the project compound.</p>

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Impacts / Project Activities	Management Plan				
Impacts due to	Mitigating Measures	Parameters to be monitored	Measurements	Frequency	Update Status
	that can be cleaned and all spilled fuel recovered and recycled.				
Air Quality	Dust suppression on roads or at open sites by sprinkling water as required at regular intervals. Cover earth stockpiles using plastic sheets or cement jute bags. Limit vehicle speed. See that vehicles comply with the National Vehicle Mass Emission Standards, 2056 BS. Regular maintenance of vehicles. Provide ventilation in confined working areas.	Operation of dust suppression tanks, sprinklers on site. Stockpiles covered with appropriate sheeting. Vehicle maintenance records; renewal of "green stickers". Ventilators in confined spaces	Visual inspection if water is sprinkled or not; logbook of operation of dust suppression trucks. Photographs of stockpiles, visual inspection reports. Check maintenance records and "green stickers". Inspection reports of site plans and no of ventilators (meets international standards). Site drawings showing location of ventilators, no of ventilators	During construction/ every week	Vehicle speed limited within the project area. No significant dust emission due to construction. Vehicle Mass Emission Standards, 2056 BS. Maintained. Only Green sticker vehicle is under operation. Photographs of stockpiling maintained. Contractor is planning to conduct for air quality survey within the project boundary soon.
Noise level and vibration	Monitoring of noise levels regularly at site. Fit mufflers in vehicles to control noise. Limit the speeds of vehicles. Ban the use of power horns in vehicles. Regular maintenance of equipment. Prohibit the operation of crushing plants and construction vehicles between 7 PM to 6 AM. Compensate the damages caused by vibrations.	Baseline noise level. Adoption of noise level control measures as specified; vehicles with mufflers installed or not; speed limit signage erected; maintenance schedule of equipment; operation log of crushing plants. Nearby structures/buildings in construction areas.	Sound level (DBA); feedback/complaints from nearby residents; number of vehicles installed with mufflers; number of vehicles with/without power horns; number of speed limit signage at the project site; inspection reports/photographs of nearby buildings/structures for cracks before/during construction	Every week	Sound level monitored by contractor and is within the permissible limit. Speed of vehicle are within the limit less than 10 km/hr. Adequate safety signage boards are in place within the project compound. No use of power horns. No crushing plant established. No significant vibration.

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Impacts / Project Activities	Management Plan				
Impacts due to	Mitigating Measures	Parameters to be monitored	Measurements	Frequency	Update Status
Waste management	Store all materials, toxic, non-toxic and hazardous materials in safe place (warehouse). Collect, segregate and dispose waste at designated areas	Waste management plan Log of collection and disposal of waste from the site	Check amount of solid waste generated and if solid waste management is carried out efficiently. Audit of waste management plans; inspection of disposal areas/site plan drawings, photographs etc.	During the construction period	Warehouse established with storage of materials and chemicals. No spillage of oils and chemicals.
Vegetation Clearance	Provide LPG/kerosene to workforce. Stockpile the felled trees and take permission from concerned authority for its use Plant and rear tree saplings at the rate of 25 saplings for each felled tree.	Cutting of only the specified and marked trees; use of timber and wood; availability of LPG/kerosene; plantation @ 25 tree saplings per cut tree Permits for tree felling and its use	Check records of trees cut and planted; whether LPG/kerosene is available in camp sites. Photographs, expiry date of permits and number of permits etc.	Regularly	LPG gas provided to workforce. No use of fuel wood within the construction site for cooking and construction purpose. Contractor is instructed to prepare plantation plan. About 54 number of trees are cut till date. Contractor will be responsible to plant saplings in the ratio of 1:25 for each cut tree within the project vicinity or elsewhere.
Damaged infrastructures and services	Reinstate/relocate community assets that are disturbed such as irrigation canals, electricity poles, telephone lines, drinking water pipes, sewerage lines, roads, etc. to a standard as before and/ or better.	Reinstatement of structurally damaged infrastructures like temples, bridges, irrigation channels, electricity poles, telephone lines, drinking water pipes, sewers, access roads, cracks in buildings etc.	Field observation to visually assess if disturbed community assets are reinstated. Design drawings and technical specifications showing areas for potential reinstatement, photographs before and after construction in sensitive areas etc.; emergency response plans	Once construction in the area is over.	No any disturbances and damage to existing infrastructure and services.

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Impacts / Project Activities	Management Plan				
	Mitigating Measures	Parameters to be monitored	Measurements	Frequency	Update Status
Crime and community stress	Prohibit gambling and alcohol consumption in camp sites. Instruct the outside workforce to respect the local cultures, traditions, rights etc. Provide security in camps	Situation of social disharmony Awareness program. Workers/ Staff conduct policy	Crime records and causes; camp issues; enforcement of remedies; security situation in camps. Audit of staff/ workers conduct policy	Once a month Once a month	Gambling and alcohol consumption in camp sites are prohibited completely. No any impact to nearby culture site Guheshwori Temple and holy river Bagmati River.
Health and hygiene	Provide regular health check-ups, sanitation and hygiene, training in community health and safety, OHS measures, health care, and control of epidemic diseases to the workforce. Launch awareness programs concerning human trafficking and the possibility of spread of STDs and HIV/AIDS using brochures, posters, and signboards. Make available first aid kits, ambulance and fire extinguishers in camp sites.	The use of safety equipment by workforce The provision of health measures and training Awareness program Signs and posters Compensation for health	Health records; records of outbreak of diseases; maintenance of health clinic; health complaints; number of awareness programs launched; number of persons trained.	Every week	Health check-up of labour carried out once. Health test carried out by contractor is available. Test carried out for Tuberculosis, Chest X-Ray, VDRL, HIV, Hepatitis and Blood Pressure. Signage are in place. Fire extinguisher are in place.
Archaeological and cultural heritage sites	Protect archaeological and cultural heritage sites: In case of relocation, consult the local community Inform the Chief District Officer (in case of chance finds) who has to report the findings in writing to the Department of Archaeology within 35 days, according to the Ancient Monuments Protection Act, 1956 and Rules, 1989. Use manual labour for digging trenches and avoid heavy equipment and pneumatic drills.	Surveys and discussion with local residents and community Notification to CDO and Department of Archaeology before works are to begin Availability of workers and equipment to undertake the works	Field observation of archaeological and cultural sites and number of chance finds to authorities. No. of notifications sent and meeting minutes/ letters of correspondence Design and technical specification documents specifying requirements. No of workers available etc.	Project site Every month	No any impact upon Archaeological and cultural heritage site with the construction of WWTP at Guheshwori.

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Impacts / Project Activities	Management Plan				
Impacts due to	Mitigating Measures	Parameters to be monitored	Measurements	Frequency	Update Status
Traffic Management	<p>Develop a traffic plan to minimize traffic flow interference from construction activities.</p> <p>Advance local public notification of construction activities, schedule, routing, and affected areas including road closures.</p> <p>Erect signage in Nepali and English languages.</p> <p>Use of steel plates or other temporary across trench facilities in key areas such as foot trails or livestock routes; arrange for pedestrian access and sidewalks and parking areas.</p> <p>Arrange for night-time construction for activities in congested/ heavy day-time traffic areas.</p> <p>Undertake trench closure and facilitate rehabilitation as quickly as feasible.</p>	<p>Working schedules and traffic plans.</p> <p>Information about construction schedule to the local people</p>	<p>Visual observation of traffic; complaints from travellers and locals; existence of signage and effectiveness of speed control and diversion measures.</p>	<p>Every week</p>	<p>No any impact upon existing traffic flow. Signage board of project information erected at the entrance gate.</p> <p>The project area is situated with the boundary wall. No direct access to locals and other unauthorized people.</p>

DSC = Design and Supervision Consultant, DWEC = District Wage Evaluation Committee, IEE = initial environment examination, KUKL = Kathmandu Upatyaka Khanepani Limited, KVWSMB = Kathmandu Valley Water Supply Management Board, PID = Project Implementation Directorate, WWTP = wastewater treatment plant.

Table 4-7: Other status of the project

Sn	Activities	Progress	Remarks
1.	Preparation/ updating of Environmental Management Plan of each sub-project by contractor based on changes in project design	EMP revision completed	EMP prepared by contractor for IS-01 and IS-02 has been approved. IS-03 contractor has submitted H&S plan. Contractor TP-02 has prepared EMP and submitted to DSC.
2.	Replacement/ shifting of community property resources	Not foreseen	
3.	Reinstallation of public utilities	Not foreseen	However, RP update is ongoing.
4.	Records of Grievances Redress	No any grievance received for environmental issues.	Complaint will be recorded in site registration book.
5.	Prohibition of employment or use of children as labor	No child labour	No any labour under the age of 16 are working
6.	Prohibition of Forced labor or Compulsory Labor	Contract/bid documents include such clauses and contractors will be reminded regarding the same.	
7.	Ensure equal pay for equal work to both men and women	Contractors will ensure and will be made aware of equal payment for men and women	Less women are working as a labour worker. Equal wage is being provided.
8.	Safety maintained at site	Safety has been maintained in all the construction sites	No any critical accident occurred till date.
9.	OHS of all the workers maintained	No any issue related to OHS observed till now	No any disturbances to the ambient environment, and locals with the establishment of camp and no any grievances from the locals. No any labour below 16 is working in construction. Potable water has been supplied to all the labours by the contractors.
10.	Implementation of all statutory provisions on labor like health, safety, welfare, sanitation and working conditions	Health checkup conducted in TP-01 to all the workers. No workers are affected severely	Test parameters are HIV/Aids, Hepatitis, VDRL, Chest X-ray, Blood pressure etc. No health checkup is being carried out by TP-02, TP-03, IS-01, 02 and 03
11.	Establishment of camps and operation	Camps are established within the project area at TP-01, whereas camps are established at the safer distance at IS-01, IS02 and	No any impacts are identified with the operation of camps. Waste generated from the camps has been disposed safely. IS-02 has established
12.	Maintenance of employment records of workers	As part of GAP, Contractors will be maintained proper attendance sheet with addition of column showing male female (GAP).	It is further requested to contractors of all the ongoing projects to maintain record of labour workers and present in the monthly progress report.

Sn	Activities	Progress	Remarks
13.	Stockpiling of the construction materials	Construction materials are stockpiled properly	No any severe impact has been identified with the stockpiling of construction materials in all the construction sites. Most of the stockpiles are along the river banks for IS projects. The contractors are requested to maintain stockpiling area properly without affecting existing river, nearby cultivated land and private property.
14.	Air and Noise pollution due to construction and excavation work	No any air and noise pollution due to construction and excavation work	Laying of sewer pipes are mostly along the river banks where there is very less traffic,
15.	Disposal of excavated soil	Soil excavated from the trench has been backfilled properly after overlaying the sewerage pipeline	Haphazard disposal of excavated soil has been avoided; no direct disposal of soil on the adjacent river.
16.	Landscape management and reinstate	Land (mostly cultivated) along the interceptor has been restored with proper backfilling and landscaping.	No any grievance received after restoring land along the interceptor alignment.
17.	Safety	IS-01, IS-02, and IS-03 contractors were instructed several times and issued instruction letters to improve safety and enhance proper barricade	Contractors required to improve more safety signals and barricade along the manholes constructed and along the trench.
18.	Any other	No any impacts identified with the overlaying of interceptor sewer pipes	Vegetation and trees situated at the banks of the river were unharmed while overlaying the sewer pipes along the alignment

The PID, with assistance from the DSC - 04 is doing the following activities:

- (i) DSC has recruited 5 Environmental Field Monitoring Staffs. 2 for IS-01, 2 for IS-02 and 1 for IS-03.
- (ii) DSC safeguard experts participated in ADB NRM held on 14-23 May 2018. Safeguard experts including Site Construction and Supervision Engineers of DSC also participated in joint field visit with ADB.
- (iii) IEE for all the sub-project is updated based on detailed design of interceptor and wastewater treatment plants; and emailed to ADB NRM team for suggestion. Comments received upon the updated report formally submitted on December 31, 2017. Incorporation of comments on IEE report is ongoing.
- (iv) Over sighting on environmental management aspects of the project and ensure EMPs are implemented by DSC and contractors;
- (v) Supervising and providing guidance to the contractors to properly carry out the construction activities considering environmental aspects as per updated EMP of the sub-project;

- (vi) Consolidating quarterly monitoring reports from DSC and submit semi-annual monitoring report to ADB;
- (vii) Conducting ongoing consultation with the community during implementation of the project; and
- (viii) Establish a grievance redress mechanism for all the contract packages interceptor, wastewater treatment plants and sewer networks. Committees for grievance redress mechanism is yet to be established. PID, consultants, contractors are coordinating with recently established elected local bodies. The committees will be established soon.

Overall Compliance with CEMP/ EMP

Table 4-8: Compliance as per CEMP

Sn.	Sub-Project Name	EMP/ CEMP Part of Contract Documents (Y/N)	CEMP/ EMP Being Implemented (Y/N)	Status of Implementation (Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)	Action Proposed and Additional Measures Required
1.	KUKL/WW/TP-01	Yes, CEMP prepared by contractor	CEMP implemented	Satisfactory	N/A
2.	KUKL/WW/TP-02	CEMP prepared by contractor	CEMP not implemented	Not implemented	Sewer pipelaying works just started along the right bank of Hanumante river. No any construction work started within the WWTPs compound area.
3.	KUKL/WW/TP-03	CEMP not prepared by contractor	CEMP not implemented	Not implemented	Contractor shall prepare CEMP and approve by DSC
4.	KUKL/WW/IS-01	CEMP prepared by contractor	CEMP not properly implemented	Moderately Satisfactory	N/A
5.	KUKL/WW/IS-02	CEMP prepared by contractor	CEMP not implemented properly	Moderately Satisfactory	N/A
6.	KUKL/WW/IS-03	CEMP not prepared by contractor	CEMP not implemented	Not implemented	Contractor shall prepare CEMP and approve by DSC

5. Approach and methodology for environmental monitoring of the project

The project comprises Design and Supervision Consultant (DSC-04) for the construction supervision of all construction. The DSC team comprises Site Construction and Supervision Engineer designated for each sub-project and an Environment Safeguard Specialist and a Social Safeguard Specialist for the monitoring of all sub projects implemented under loan 3000. DSC has recruited 5 Environmental Field Monitoring Staffs; 2 for IS-01, 2 for IS-02 and 1 for IS-03 for the month of June and July 2018 in order to strengthen the field monitoring and enhance safety during construction especially at Interceptor Sewer Projects IS-01, IS-02 and for IS-03. The overall responsibility of the

environment field monitors is to monitor construction activity regarding environment safeguard. They are responsible to fill up safety checklist before start of construction work every morning.

The project also comprises Community Awareness and Social Safeguard Consultant (CASSC) a separate consultant team for the generation of awareness at the local level. Observation and site meetings can be considered as major approach and methodology for the monitoring of the project.

6. Monitoring of environmental impacts on project surroundings

No any impacts upon air, water quality and noise has been identified with the construction activity of wastewater treatment plant and laying of sewerage pipes of interceptor packages along the river banks.

Waste water treatment plant sites (WWTPs)

Construction of TP-01

- The construction site is plane and flat area and no any excavated earth material has been disposed into the holy Bagmati river. Labour camps are established within the project construction site. The waste generated from the camps are well managed. Separate toilets are well established for male and female workers and wastes from toilets are also managed within the construction site establishing septic tanks. Contractor has also supplied potable water to labour workers. The boundary of project area has been maintained hence the construction work do not have direct impact to surroundings. The vicinity of the project area is now urbanized significantly. Bagmati river is situated at the east and south; Guheshwori temple is situated at south-west direction; whereas urban road and dense settlement is existed at the norther side of the project area. No any issues related to noise due to construction and movement of construction vehicle. There is no any significant noise disturbance due to construction work. Traffic along the existing road is very significant as most of the vehicle from outskirts such as from Sankhu, Jorpati, Sundarijal area ply the road as short cut Bagmati corridor rout in order to reach inner area of Kathmandu. Significant number of construction vehicles also ply the road from such outskirts and vice versa. All construction materials are stored with the project compound area without affecting others. Night shift has been carried out for approximately two weeks during the month of March/April for the construction of structure for anaerobic digester. The night shift work has been completed successfully. The construction works are being carried out only during day time for the rest of the months. Sufficient safety signage boards have been established within the project area.
- Medical camp was conducted for the sub-contractor staffs and workers successfully on 28 April 2018 at Helping Hands Community Hospital. As the medical checkup was included with blood test for Hepatitis, HIV, VDRL, Tuberculosis and Chest x-ray, it was conducted at hospital instead of conducting at site. The total number of persons attended was 135 persons. The medical result shows significant positive result of all the workers attended for test. No any grievance regarding social and environment aspect is recorded with the ongoing construction of WWTP at Guheshwori.

Other activities conducted by TP-01 contractor regarding environmental and social safeguards are presented in the following table

Table 6-1: Safeguards carried out by TP-01 contractor

Sn.	Activities	Date	Remarks
1.	Medical Camp to workers	28/04/2018	Medical checkup was included with blood test for Hepatitis, HIV, VDRL, Tuberculosis and Chest x-ray, 135 persons. The medical result shows significant positive result of all the workers attended for test.
2.	Trainings on manual handling	17/05/2018	Training provided to 50 Labourers
3.	Noise and vibration level monitoring	20/05/2018	Report submitted to DSC. Maximum noise level at construction site is 97dbA
4.	Pest control activities	27/05/2018	Report submitted to DSC
5.	First Aid kit inspection	18/05/2018	Report submitted to DSC. 6 numbers of kits are available within the site and relevant items of kit items are in place.
6.	World Environment Day celebration	05/06/2018	Mass TBT conducted at site for creating awareness among workers regarding the importance of protecting environment. Also discussed theme of 2018 and made aware about the storage, handling and disposing of plastics in safe manner without effecting environment.

Table 6-2: Noise Quality Results of TP-01

Site No.	Date of Testing	Site Location	LA _{eq} (dBA) (Government Standard)	
			Day Time	Night Time
Guheshwori WWTP	20/05/2018	Within the WWTP site	Noise level at Batching plant area: Min-94dbA Max-97dbA	N/A
			Noise level at normal working area: Min-56.9dbA Max-75dbA	N/A
			Noise level monitoring while excavator is in operating condition Min-73.5dbA Max-84.6dbA	N/A
			Noise level monitoring while DG is in operating condition. Min-78dbA Max-79.8db	N/A
			Vibration Level monitored which was passed through the body of batching plant and compressor. When compressor in working condition Reading: 8.5mm/s	N/A

Construction of TP-02

- Construction of TP-02 (Sallaghari, Kodku and Dhobighat) has not been started significantly. Approximately, 468 meters of sewer pipe line has been layed with 9 numbers of manholes completed without slab along the right bank of Manohara River, at the downstream of Kodku WWTP. Construction of 5 manholes are still remaining among the total of 14. Deep excavation of trenches carried out where shoring is required. DSC has instructed for the establishment of safety along the construction site. No other environment and safety issues identified with the laying of sewer pipes and construction of manholes.

- OHS performance was under satisfactory with lot of areas to be improved.
- All the workers were not using safety apparel. Especially, workers at construction of bypass pipeline were reluctant to wear visibility vest while the workers at Kodku piling area do not wear safety shoes.
- Lack of standard barricades around the unfinished manholes.
- Reinstatement of road has been started leading to public grievance.
- Site office has not been established yet for the Engineer.
- DSC has issued instruction letter to improve the health and safety within the construction sites.

Construction of TP-03

- Construction of TP-03 (Dhobighat) has not been started. Preparation of Detail Design Report by contractor is ongoing.

Construction of Interceptor Sewer sub-projects (IS-01, 02 and 03)

- Dust is identified only during the excavation of trenches for the laying of sewerage pipes along the river banks. Most of the river banks are muddy and dusty however; there is very less houses and settlement established close to the river banks.
- The excavated materials stockpiles close to the river banks but no bank erosion identified due to construction. Sedimentation control measures such as crib wall is under construction at 150m downstream of Radhe Radhe bridge along Hanumante river (IS-01); no any significant impact of sedimentation identified in other projects.
- Dust measurement has not been carried out yet by the contractor. However, on any remarkable dust pollution is visible after completion of pipe laying works.
- No any open storage of cements, chemicals and refueling around the sites are identified.
- Spill kits are not in place on sites, as the use and spillage of chemicals in interceptor sewer sub-projects is minimal. Spillage of small amount of diesel oil occurs while transferring from container to the excavator or/and generator established for power back up.
- Contractors were instructed to maintain proper signage boards in order to maintain safety all along the project sites. Instruction letters regarding safety has been issued to all IS contractors in order to maintain safety at ongoing sites as well as unattended manholes along the alignment. However, till date there is no any major and fatal accident has occurred due to construction activity.
- Safety checklist has been prepared as a part of Health and Safety Manual by DSC-04 for loan 3000. Safety checklist has also been used during site visits by Environment Field Monitors and Safeguard specialists of DSC. Some filled checklists are attached in Annex.
- Noise is not significant with the overlaying of sewerage pipelines. As the sewerage alignment is all along the river banks the area gets muddy during the rainy season.
- No any water quality test has been carried out yet. However, water pollution due to construction work does not seems significant.

7. Grievance Redress Mechanism

Grievance redress Committee (GRC) at the project level is in place. It is a four tiers mechanism to address grievances related to APs in the implementation of the project. GRCs at other levels will be formed during the implementation of the project as mentioned in the IEE Report.

Till date no any grievances related to the environmental issue were received with the implementation of the sub-projects. As most of the interceptor sewer construction work has been carried out along the river banks; disturbance to traffic is minimal. Similarly, the construction of WWTPs are within the confined project location; the construction activities do not have any

significant disturbance upon environment and to the local people. Consultation and coordination between consultants, employer and contractors including coordination with recently elected local bodies is still going.

8. Complaints received during the reporting period

No any complaints and grievance received on IEE report and upon implemented TP and IS Sub-projects.

9. Summary of key issues and remedial actions

The following presents summary of key issues and its remedial actions required.

Table 9-1:Key issues and remedial actions for IS sub-projects.

Sn.	Key Issues	Remedial Actions	Time bound
1.	Safety during construction	Regular tool box talks, proper PPEs to all labour workers	Daily. Contractor will be responsible to provide PPEs to labour workers As and when required.
2.	Proper barricade along the construction sites especially at IS sites	Provide barricading	Contractors were instructed to install green and safety signboards for soft barricade as well as hard barricade for the unattended manholes along the alignment.
3.	Erosion due to trench excavation	Soaring along the trench	Especially at deep excavated trenches

Annex 1: Photographs



Sign boards with emergency assembly point and emergency contact numbers at TP-01



Safety signage boards displayed within the project construction area WWTP-01



Safety signage boards displayed within the project construction area WWTP-01



Safety signage boards displayed in TP-01



Workers working at scaffolding using safety apparels at TP-01



Safe storage of construction materials within the project construction boundary.



Laborer erecting safety barrier at -TP-02



Safety barrier at -TP-02



Hard barricade applied along the TP-02 alignment



Stock piling of construction material.



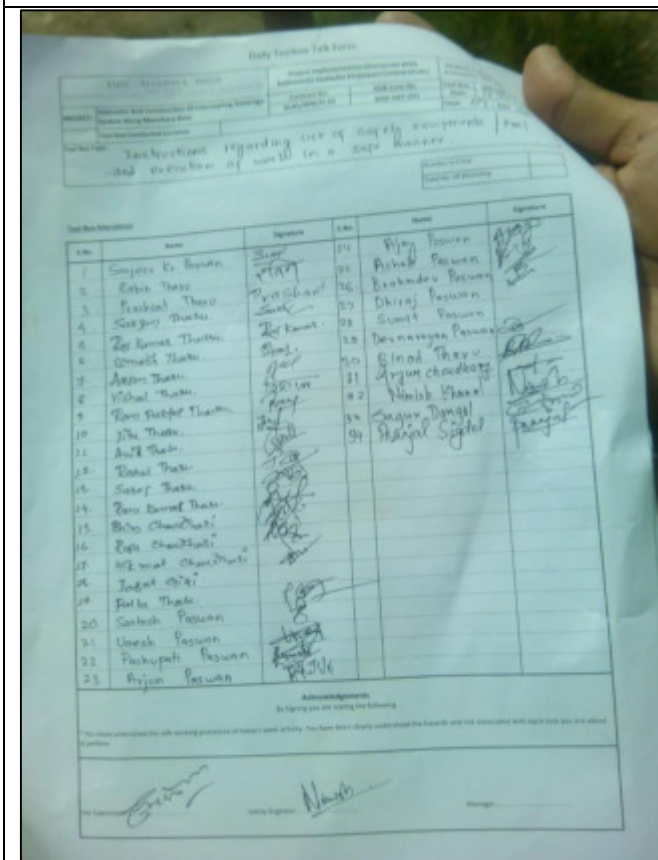
Solid waste disposal area along the IS-01



Manhole construction at IS-01 site.



First Aid kit maintained at IS-01 site



List of participants of Toolbox talk-IS02



Toolbox talk conducted on 19 June-IS02



<p>Manhole under construction at Pepsicola site IS-02</p>	<p>Manhole under construction at Pepsicola site IS-02</p>
	
<p>Mixing Work for Manhole Construction at Ittapakhe, IS-03</p>	<p>Barricade at the starting point of construction site at Ittapakhe, IS-03</p>
	
<p>Construction work in the fifth manhole at Ittapakhe at IS-03</p>	<p>Storage of construction material sewer pipes along the side of the river bank</p>

Annex 2: Public Notice of HPCIDBC about RoW of River

Public Notice of HPCIDBC about RoW of River


PROHIBITION NOTICE OF CONSTRUCTION OF ANY STRUCTURES ON THE RIGHT OF WAY (ROW) OF THE RIVERS OF KATHMANDU VALLEY BY THE HIGH POWERED COMMITTEE FOR INTEGRATED DEVELOPMENT OF THE BAGMATI CIVILIZATION (HPCIDBC)

(Notice published on 19 Asadh 2069 (3 July 2012) in the government daily newspaper *Gorkhapatra*)

This prohibition notice covers construction of any structures within the Right of Way (RoW) on the following banks of rivers in Kathmandu Valley:

1. Bagmati, Bishnumati, and Manohara rivers—20 m from either side of the banks of the rivers.
2. Dhobikhola River—areas as fixed by the Dhobikhola project and 9 m from either side of the banks of the river in non-project areas.
3. Nakkhu River—12 m from either side of the bank of the river.
4. Balkhu, Karmanasa, Kodku, Sangle, and Mahadev Rivers—12 m from either side of the banks of the rivers.
5. Samakhushi and other rivers flowing in the valley— 4 m from either side of the banks of the rivers.
6. Hanumante Rivers—20 m from either side of the banks of the rivers.

Public Notice of HPCIDBC about RoW of River published in newspaper



नेपाल सरकार
अधिकार सम्पन्न वाग्मती सभ्यता एकीकृत विकास समिति
गुह्येश्वरी, काठमाण्डौको

सूचना ! सूचना !! सूचना !!!

काठमाण्डौ उपत्यका नगर विकास समितिले निर्धारण गरेको "काठमाण्डौ उपत्यका भित्रका नगरपालिका र नगरान्मुख गा.वि.स. हरूमा गरिने निर्माण सम्बन्धी मापदण्ड "२०६४" को परिच्छेद २ को प्रकरण नं. ११ र सोही परिच्छेदको प्रकरण ६.२ को देहाय १ र २ मा नेपाल सरकार (मन्त्रिपरिषद्) बाट मिति २०६५/०८/०१ मा भएको संशोधित निर्णय अनुसार खोला किनारामा निर्माण गर्ने सम्बन्धमा देहायको खोलाको नापीको नक्साबाट कायम रहेको छेउवाट दायौं वायाँ देहायका दूरी छोडी मात्र निर्माण गर्न पाइने कानूनी प्रावधान रहेको व्यहोरा सबैमा जानकारीको लागि अनुरोध गरिन्छ ।

देहाय

१. वाग्मती, विष्णुमती र मनोहरा खोलामा २०/२० मीटर
२. धोविखोलाको हकमा धाविखोला आयोजना भएको स्थानमा प्रोजेक्टको प्लानिङ्ग अनुसारको दूरी र प्लानिङ्ग वाहेकका स्थानमा ९/९ मीटर
३. नख्खु खोलामा १२/१२ मीटर
४. बल्खु, कर्मनासा, कोङ्कु, साङ्ले र महादेव खोलामा १०/१० मीटर
५. करखुसी खोलामा ६/६ मीटर
६. टुकुचा, सामाखुसी, र उपत्यकामा वग्ने अन्य खोलामा ४/४ मीटर र कुनैपनि खोला खोल्सी र राजकूलो छोप्न पाइने छैन ।
७. हनुमन्ते खोला वग्ने नगरान्मुख गा.वि.स. हरूमा समेत खोलाको किनारवाट २० मीटर छाडी निर्माण गर्न पाइने साथै मापदण्डको परिच्छेद २ को प्रकरण नं.६.२ को देहाय १ र २ मा रहेको FAR १.२५ को सट्टा १.५ कायम गर्ने। उपरोक्त मापदण्ड कायम राखी यस समितिको मिति २०६९/०२/२५ को १७३औं बोर्ड बैठकको निर्णयबाट वाग्मती नदीको विभिन्न स्थानमा देहाय बमोजिम बहाव क्षेत्र (नदीको भित्री भाग) निर्धारण भएको छ । साथै काठमाण्डौ उपत्यकाका अन्य नदीहरू विष्णुमती, मनोहरा, धोवीखोला, नख्खुखोला, बल्खु, कर्मनासा कोङ्कु, साङ्ले, महादेवखोला, करखुसी खोला, टुकुचा, सामाखुसी, हनुमन्ते लगायत अन्य खोलासमेतको बहाव क्षेत्र निर्धारण हुने क्रम जारी रहेकोले नदीहरूको बहावक्षेत्रमा प्रतिकुल असर पर्ने कार्य नगर्नु नगराउनु हुन समेत सम्बन्धित सरोकारवाला निकाय, व्यक्ति, संघ/संस्थालाई यसै सूचनाद्वारा जानकारी गराइन्छ ।

वाग्मती नदीको देहायको स्थानमा देहाय बमोजिम बहावक्षेत्र (नदीको भित्री भाग) निर्धारण गरिएको छ ।

- (क) सुन्दरीजल-गोकर्ण ब्यारेजसम्म २० मीटर,
- (ख) गोकर्ण-ब्यारेज-जोरपाटी पुलसम्म ३५ मीटर एवं जोरपाटी पुलगुह्येश्वरी खण्डमा ४० मीटर,
- (ग) हालको वाग्मतीनदीको बहावलाई नै आधार मानी तीलगंगा-शंखमूल खण्डमा न्यूनतम ३० मीटर,
- (घ) शंखमूलदेखि विष्णुमती नदीको संगमसम्म न्यूनतम ६० मीटर र
- (ङ) विष्णुमती दोभान तथा सोभन्दा तल्लो तटीय क्षेत्रमा न्यूनतम ८० मीटर

यो सूचनालाई बेवास्ता गरी उक्त बहाव क्षेत्र एवं मापदण्ड विपरित कुनै प्रकारको कार्य गरे गराइएको पाइएमा कानून बमोजिम कारवाही भैजाने व्यहोरा समेत अवगत गराइन्छ ।

Annex 3: Safety Checklist

Some filled Safety Checklists for different construction sites.

Kathmandu Valley Wastewater Management Project
 Project Implementation Directorate, Kathmandu Upatyaka Khanepan Limited
 Environmental Monitoring Checklist - Treatment Plant & Interceptor Sewer Projects

Name of Work: Construction of Masonry Wall
 Name of Contractor: LAMA RAMAN-Rolden Road JV
 Contract No: IS-03
 Monitoring Date: 23 April, 2018

Place	SN	Subject	Activities	Yes	No	Full Score	Achieved Score	Remarks
1	Signage	Available Sign Board with the Name of Project & Contractor			2	2		
		Available Visible Sign Board for Traffic Alternative Route			2	2		
		Available of authorized representative of contractor at work site (Engineer/Supervisor)	✓		3	3		
		Regular visit of work area for supervision by contractor's Safety supervisor	✓		3	3		
		Is the safety barricade placed around is adequate	✓		3	2	Repair more	
		Has there been regular induction training carried out by the contractor to their labor (CRIS measures, STDs and HIV/AIDS, human trafficking, community health & safety, control of epidemic disease)	✓		3	1		
		Is workers provided with regular health check - up	✓		3	1		
		Is there any emergency plan for the construction site			4	1	Under preparation	
		Entry of Non-Authorized Person inside the area of Safety Barrier			3	3	NO entry	
		Does the contractor check his machinery regularly and is it in good condition			4	2		
2	Health & Safety	Use of Personal Protective Equipments (PPEs) by Workers i.e. hard helmets, PPE vest, Gloves, Safety Glasses, Boots, Masks etc and mention in remarks the % of use and which PPEs is not used.			5	3		
		Grant of Permission for entry inside the work areas with safety barrier to the site engineer and other construction personnel without the use of PPEs such as Hard helmets and Reflector Jacket.			2	1		
		Is the First Aid box on site and in good condition/First Aider			3	3		
		Is temporary toilet established at labor camp in proper position and waste from the toilet & camp has been managed properly			3	1		
		Are all the laborers above age 16 working on site			3	2		
		Has potable water been provided to all the laborers			3	2		
		Help Desk Table, Chair and First Aid with Grievance Register			3	1		
		Available visible by Public			3	1		
		Helper at Help Desk Available			3	1		
		Is the ground of working site clear and secure?			3	3		
3	Grievances Redress Mechanism	Is the excavated material piled safely without earth falling into the trench again			3	3		
		Are all the excavated trenches > 1.5m depth (Trench Shoring)			3	3		
		Has construction activities affected the existing flora and fauna	✓		4	4	No excavation for trench yet.	
		Are the construction materials stockpiled properly	✓		4	3		
		Are safety measures provided	✓		3	3		
		Are workers to avoid water pollution	✓		3	3		
		Has Ambient Air Quality Test being done	✓		3	3		
		Is water sprinkling done regularly	✓		3	3		
		Has noise level being monitored	✓		3	2		
		Is drinking water quality being tested or not	✓		3	2		
4	Environmental Monitoring and Housekeeping	Are all the areas free of spilled of diesel and other pollutants within the construction and around the campsite			3	2		
		Segregation of waste and storage of toxic and hazardous materials in safe place (waste house)			3	3		
		Is the housekeeping at the site good (sharp materials stored properly, safety signage in place)			2	2		
		Availability of record keeping system for damages in private and social structure			3	2	Not affected	
		Rehabilitation of the work site/ Reinstatement of the community assets like: irrigation canal, electricity poles, telephone lines, water pipes)			3	3		
		TOTAL			100	85		

If any item is answered with a "No", explain below:

Signature: Rakesh Chhetri Pushpa Koirala
 Date: 1-2-2018
 Signature: abin shrestha
 Date: 23 April 2018

Project Implementation Directorate, Kathmandu Upatyaka Khanepani Limited Environmental Monitoring Checklist - Treatment Plant & Interceptor Sewer Projects							
Name of Work:		Monitoring Date: 3 April 2018					
Name of Contractor:		Time:					
Contract No:		Place:					
SN	Subject	Activities	Yes	No	Full Score	Achieved Score	Remarks
1	Signage	Available Sign Board with the Name of Project & Contractor	✓		3	3	
		Available Visible Sign Board for Traffic Alternative Route	✓		2	2	
		Available of authorized representative of contractor at work site (Engineer/Supervisor)	✓		3	3	
		Regular visit of work area for supervision by contractor's Safety supervisor	✓		3	3	
		Is the safety barricade placed around is adequate	✓		3	3	
		Has there been regular induction training carried out by the contractor to their labor (OHS measures, STDs and HIV/AIDS, human trafficking, community health & safety, control of epidemic disease)	✓		3	3	
		Is workers provided with regular health check - ups	✓		3	3	
		Is there any emergency plan for the construction site	✓		4	4	
		Entry of Non-Authorized Person inside the area of Safety Barriers	✓		3	3	
		Does the contractor check his machinery regularly and is it in good condition	✓		4	4	
		Use of Personnel Protective Equipments (PPEs) by Workers i.e. hard helmets, PPE vest, Gloves, Safety Glasses, Boots, Masks etc and mention in remarks the % of use and which PPEs is not used.	✓		5	4	NO VEST
		Grant of Permission for entry inside the work areas with safety barrier to the site engineer and other construction personnel without the use of PPEs such as Hard helmets and Reflector Jacket	✓		2	2	
		Is the First Aid box on site and in good condition/First Aider	✓		3	3	
		Is temporary toilet established at labor camp in proper position and waste from the toilet & camps has been managed properly	✓		3	3	
		Are all the laborers above age 16 working on site	✓		3	3	
		Has potable water been provided to all the laborers	✓		2	2	
3	Grievances Redress Mechanism	Help Desk, Table, Chair and First Aid with Grievance Register	✓		3	3	
		Available visible by Public	✓		3	3	
		Helper at Help Desk Available	✓		2	2	
		Is the ground of working site clear and secure?	✓		3	3	
		Is the excavated material piled safely without earth falling into the trench again	✓		3	3	
		Are all the excavated trenches > 1.5m depth (Trench Shoring)	✓		3	3	
		Has construction activities affected the existing flora and fauna	✓		4	4	
		Are the construction materials stockpiled properly	✓		4	4	
		Are safety measures provided	✓		3	3	
		measures to avoid water pollution	✓		3	3	
		Has Ambient Air Quality Test being done	✓		3	3	
		Is water sprinkling done regularly	✓		3	3	
		Has noise level being monitored	✓		3	3	
		Is drinking water quality being tested or not	✓		3	3	
		Are all the areas free of spilled of diesel and other pollutants within the construction and around the campsite	✓		3	3	
		Segregation of waste and storage of toxic and hazardous materials in safe place (waste house)	✓		3	3	NO FIRE & NO HAZARD
		Is the housekeeping at the site good (sharp materials stored properly, safety signage in place)	✓		2	2	
		Availability of record keeping system for damages in private and social structure	✓		3	3	NO DAMAGE
5	Damages/Repairs in Service Sector	Rehabilitation of the work site/ Reinstatement of the community assets like: irrigation canal, electricity poles, telephone lines, water pipes)	✓		3	3	NIL
TOTAL					100	93	

If any item is answered with a "No", explain below:

- ① ~~Health~~ Health checkup planned and waiting for agency timing/availability Before 15th May 2018
- ② Air Quality and Noise Test will carried out on or before 15th May 2018

Name: Rikesh Chitrakar Signature: [Signature] Date: 2 April 2018	On behalf of contractor Name: RANJION MENON Signature: [Signature] Date: 01/4/2018
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Kathmandu Valley Wastewater Management Project
Project Implementation Directorate, Kathmandu Upatyaka Khanepani Limited
Environmental Monitoring Checklist - Treatment Plant & Interceptor Sewer Projects

Name of Work: Construction of Lamaha-Raman
Name of Contractor: GIETE - LAMA-RAMAN
Contract No: IS-RI
Place: Radhi Radhi Bridge
Monitoring Date: 16 March 2018
Time: _____

SN	Subject	Activities	Yes	No	Full Score	Achieved Score	Remarks
1	Signage	Available Sign Board with the Name of Project & Contractor	✓	✗	3	3	No proper information Board & Traffic diversion
		Available Visible Sign Board for Traffic Alternative Route	✓	✗	2	2	
		Available of authorized representative of contractor at work site (Engineer/Supervisor)	✓	✗	3	3	
		Regular visit of work area for supervision by contractor's Safety supervisor	✓	✗	3	0	
		Is the safety barricade placed around is adequate	✓	✗	3	0	
2	Health & Safety	Has there been regular induction training carried out by the contractor to their labor (OHS measures, STDs and HIV/AIDS, human trafficking, community health & safety, control of epidemic disease)	✓	✗	3	0	No Gloves
		Is workers provided with regular health check - up	✓	✗	3	0	
		Is there any emergency plan for the construction site	✓	✗	4	0	
		Entry of Non-Authorized Person inside the area of Safety Barriers	✓	✗	3	3	
		Does the contractor check his machinery regularly and is it in good condition	✓	✗	4	4	
		Use of Personal Protective Equipments (PPEs) by Workers (i.e. hard helmets, PPF vest, Gloves, Safety Glasses, Boots, Masks etc and mention in remarks the % of use and which PPEs is not used)	✓	✗	5	3	
		Grant of Permission for entry inside the work areas with safety barrier to the site engineers and other construction personnel without the use of PPEs such as Hard helmets and Reflector Jacket	✓	✗	2	2	
		Is the First Aid box on site and in good condition/First Aider	✓	✗	3	0	
		Is temporary toilet established at labor camp in proper position and waste from the toilet & camp has been managed properly	✓	✗	3	3	
		Are all the laborers above age 14 working on site	✓	✗	3	3	
3	Grievances Redress Mechanism	Has potable water been provided to all the laborers	✓	✗	2	2	N/A N/A Not Water
		Help Desk, Table, Chair and First Aid with Grievance Register	✓	✗	3	0	
		Available visible by Public	✓	✗	3	0	
		Helpdesk at Help Desk Available	✓	✗	2	0	
		Is the ground of working site close and secure?	✓	✗	3	0	
		Is the excavated material piled safely without earth falling into the trench again	✓	✗	3	0	
		Are all the excavated trenches > 1.5m depth (Trench Shoring)	✓	✗	3	0	
		Has construction activities affected the existing flora and fauna	✓	✗	4	0	
		Are the construction materials stockpiled properly	✓	✗	4	0	
		Are safety measures provided	✓	✗	3	0	
4	Environmental Monitoring and Housekeeping	measures to avoid water pollution	✓	✗	3	3	N/A N/A Not Water
		Has Ambient Air Quality Test being done	✓	✗	3	3	
		Is water sprinkling done regularly	✓	✗	3	3	
		Has noise level being monitored	✓	✗	3	3	
		Is drinking water quality being tested or not	✓	✗	3	3	
		Are all the areas free of spilled of diesel and other pollutants within the construction and around the campsite	✓	✗	3	3	
		Segregation of waste and storage of toxic and hazardous materials in safe place (waste house)	✓	✗	3	3	
		Is the housekeeping at the site good (sharp materials stored properly, safety signage in place)	✓	✗	2	0	
		Availability of record keeping system for damages in private and social structure	✓	✗	3	3	
		Rehabilitation of the work site/ Reinstatement of the community assets like: irrigation canal, electricity poles, telephone lines, water pipes)	✓	✗	3	3	
5	Damages/Repairs in Service Sector				3	3	Structure within 30m from the Bank.
					3	3	
TOTAL					100	47	

If any item is answered with a "No", explain below:

Signature: Rakesh Chitrakar Pushpa Koirala
Date: 16 March 2018
Signature: Sanjeev Panthar
Date: 16 March 2018
Mobile No: 980170402

Kathmandu Valley Wastewater Management Project
Project Implementation Directorate, Kathmandu Upatyaka Khanepani Limited
Everyday OHS Monitoring Checklist for Interceptor Sewer Projects

Name of Work: Jadibuti (Babar) Construction of Manhole & SMW
Name of Contractor: GIEFC / LAMAIRAMAN

Contract No: _____ **Monitoring Date:** 2075106102
Time: 8:00 am

Place:						
SN	Activities	Yes	No	Full Score	Achieved Score	Remarks
1	Available Sign Board with the Name of Project & Contractor including start and completion date		✓	6	0	
2	Available Visible Sign Board for Traffic Alternative Route/ Safety sign boards		✓	5	0	
3	Available of authorized representative of contractor at work site (Engineer/Supervisor)	✓		5	5	
4	Regular visit of work area for supervision by contractor's Safety supervisor	✓		5	5	
5	Is the safety barricade placed around is adequate (1 m height of green net that must be tightened either to a bamboo pole or to iron poles which shall be installed at least 1.5m distance from the edge of the excavation or as local conditions required)		✓	10	0	
6	Toolbox talk completed?	✓		5	3	Inadequate
7	Is there any emergency plan for the construction site/Emergency contact numbers provided to workers?	✓		6	3	Emergency Plan is not sufficient
8	No entry of Non-Authorized Person inside the area of Safety Barriers.		✓	3	0	
9	Does the contractor check his machinery regularly and is it in good condition (Excavator etc.)?	✓		5	5	
10	Use of Personnel Protective Equipments (PPEs) by Workers i.e. hard helmets, PPE vest, Gloves, Boots, etc	✓		5	3	Hard hat, helmet & vest are used but no gloves
11	Is the First Aid box on site and in good condition with all the items intact /First Aider?	✓		9	5	Inadequate
12	Are all the laborers above age 16 working on site?	✓		7	7	
13	Has potable water been provided to all the laborers?	✓		3	2	Potable water is provided but not all laborers
14	Help Desk: Table, Chair and First Aid with Grievance Register Available visible by Public		✓	3	0	
15	Is the ground of working site clear and secure against any possible injury?	✓		4	4	
16	Is the excavated material piled safely without earth falling into the trench again?	✓		5	5	
17	Are all the excavated trenches > 1.5m depth (Trench Shored)		✓	10	0	
18	There is no any spillage of chemicals around the working site.	✓		4	4	
				100	53	

The acceptable score is 80 and above

If any item is answered with a "No", explain below:

DSC04/CASSC Name: <u>Saroj Ghimire / Safety Officer</u> Signature: <u>[Signature]</u> Date: <u>2075106102</u> Mobile No: <u>985104736</u>	On behalf of contractor Name: <u>Punam Vyas</u> Signature: <u>[Signature]</u> Date: <u>2075106102</u> Mobile No: <u>9801809091</u>
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Remarks: The total marks obtained in the project area where inspected is below the margin level. So, contractor need to upgrade the OHS setup very soon without failure by one week.

Kathmandu Valley Wastewater Management Project
Project Implementation Directorate, Kathmandu Upatyaka Khanepani Limited
Everyday OHS Monitoring Checklist for Interceptor Sewer Projects

Name of Work: DSC 4 JS02		Monitoring Date: June 08, 2018	
Name of Contractor: ZIEC, Sharma and BKOI JV		Time: 8:00 AM	
Contract No: KUKL/WW/IS-02			
Place: New Labor camp			

SN	Activities	Yes	No	Full Score	Achieved Score	Remarks
1	Available Sign Board with the Name of Project & Contractor including start and completion date	✓		6	4	
2	Available Visible Sign Board for Traffic Alternative Route Safety sign boards	✓		4	4	
3	Availability of authorized representative of contractor at work site (Engineer/Supervisor)	✓		5	5	
4	Regular visit of work area for supervision by contractor's Safety supervisor	✓		5	5	
5	Is the safety barricade placed around is adequate (1 m height of green net that must be tightened either to a bamboo pole or to iron poles which shall be installed at least 1.5m distance from the edge of the excavation or as local conditions required)	✓		10	7	
6	Toolbox talk completed?	✓		5	5	
7	Is there any emergency plan for the construction site? Emergency contact numbers provided to workers?	✓		6	4	
8	No entry of Non-Authorized Person inside the area of Safety Barriers	✓		3	3	
9	Does the contractor check his machinery regularly and is it in good condition (Excavator etc.)?	✓		5	5	
10	Use of Personal Protective Equipments (PPEs) by Workers (e.g. hard helmets, PPE vest, Gloves, Boots, etc)	✓		5	4	
11	Is the First Aid box on site and in good condition with all the items intact / First Aider?	✓		9	8	
12	Are all the laborers above age 16 working on site?	✓		7	7	
13	Has potable water been provided to all the laborers?	✓		3	3	
14	Help Desk: Table, Chair and First Aid with Grievance Register Available visible by Public	✓		3	2	
15	Is the ground of working site clear and secure against any possible injury?	✓		4	4	
16	Is the excavated material piled safely without earth falling into the trench again?	✓		5	4	
17	Are all the excavated trenches > 1.5m depth (Trench Shored)	✓		10	8	
18	There is no any spillage of chemicals around the working site.	✓		4	3	
				100	85	

The acceptable score is 80 and above

If any item is answered with a "No", explain below:

DSC04/CASSC Name: Pranjal & Ajit Signature: <i>[Signature]</i> Date: June 08, 2018 Mobile No: 9851186058, 9842135029	On behalf of contractor Name: Govinda K.C. Signature: <i>[Signature]</i> Date: June 08, 2018 Mobile No: 984240972
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Kathmandu Valley Wastewater Management Project
Project Implementation Directorate, Kathmandu Upatyaka Khanepani Limited
Everyday OHS Monitoring Checklist for Interceptor Sewer Projects

Name of Work: Manhole Construction and Trench Excavation
 Name of Contractor: LAMA- RAMAN- GOLDEN WOODS PVT. LTD.
 Contract No: KVKL/WW/IS-03 Monitoring Date: 5 June 2018
 Time: 10:45 AM
 Place: Itarakh, IS-03 - Khasang Khursung river

SN	Activities	Yes	No	Full Score	Achieved Score	Remarks
1	Available Sign Board with the Name of Project & Contractor including start and completion date		✓	0	0	
2	Available Visible Sign Board for Traffic; Alternative Route; Safety sign boards	✓		3	3	
3	Available of authorized representative of contractor at work site (Engineer/Supervisor)	✓		5	5	
4	Regular visit of work area for supervision by contractor's Safety supervisor		✓	5	0	
5	Is the safety barricade placed around is adequate (1 m height of green net that must be tightened either to a bamboo pole or to iron poles which shall be installed at least 1.5m distance from the edge of the excavation or as local condition required)	✓		10	5	• Inadequate • Shoring has been done nowhere.
6	Toolbox talk completed?	✓		5	4	
7	Is there any emergency plan for the construction site (Emergency contact numbers provided to workers)	✓		6	1	Available with supervisor and Engineer only
8	No entry of Non-Authorized Person inside the area of Safety Barriers	✓		3	3	
9	Does the contractor check his machinery regularly and is it in good condition (Excavator etc.)	✓		5	4	
10	Use of Personnel Protective Equipments (PPEs) by Workers (i.e. hard helmets, PPE vest, Gloves, Boots, etc.)	✓		5	4	
11	Is the First Aid box on site and in good condition with all the items intact (First Aider)	✓		9	6	Inadequate excavator operator & his helper are too young.
12	Are all the laborers above age 18 working on site	✓		7	5	
13	Has potable water been provided to all the laborers	✓		3	2	
14	Help Desk, Table, Chair and First Aid with Grievance Register Available visible by Public		✓	3	0	
15	Is the ground of working site clear and secure against any possible injury?	✓		4	3	
16	Is the excavated material piled safely without earth falling into the trench again	✓		5	2	
17	Are all the excavated trenches > 1.5m depth (Trench Shored)	✓	✓	10	0	
18	Is there any spillage of chemicals	✓		4	4	
	Total			100	52	

There is no
 The acceptable score is 80 and above

If any item is answered with a "No", explain below:

- Lack of signboard at the construction site.
- The assigned safety supervisor rarely visit the site.
- Lack of Help desk
- Shoring has been done nowhere. Given the local condition of geology and soil type, shoring is a must at least at the manhole construction site.

DS/EC/SCSC	On behalf of contractor
Name: <u>Asha L. Suwal</u>	Name: <u>Mohan G.C.</u>
Signature: <u>[Signature]</u>	Signature: <u>[Signature]</u>
Date: <u>5 June 2018</u>	Date: <u>5 June 2018</u>
Mobile No: <u>9843559349</u>	Mobile No: <u>9849320187</u>

Kathmandu Valley Wastewater Management Project
Project Implementation Directorate, Kathmandu Upatyaka Khanepani Limited
Everyday OHS Monitoring Checklist for Interceptor Sewer Projects

Name of Work: Excavation for Manhole Construction & Sewer pipe laying
 Name of Contractor: LAMA - RAMAN
 Contract No: KVKL/WW/IS-03 Monitoring Date: 6 June 2018
 Place: Jhapa, Khasang Khosang River, IS 03 Time: 10:45 AM

SN	Activities	Yes	No	Full Score	Achieved Score	Remarks
1	Available Sign Board with the Name of Project & Contractor including start and completion date		✓	6	0	
2	Available Visible Sign Board for Traffic/Alternative Route/ Safety sign boards	✓		5	5	
3	Available of authorized representative of contractor at work site (Engineer/Supervisor)	✓		5	5	
4	Regular visit of work area for supervision by contractor's Safety supervisor	✓		5	5	
5	Is the safety barricade placed around is adequate (1 m height of green net that must be tightened either to a bamboo pole or to iron poles which shall be installed at least 1.5m distance from the edge of the excavation or as local conditions required)	✓		10	6	
6	Toolbox talk completed?	✓		5	4	
7	Is there any emergency plan for the construction site/Emergency contact numbers provided to workers	✓		6	2	
8	No entry of Non-Authorized Person inside the area of Safety Barriers	✓		3	3	
9	Does the contractor check his machinery regularly and is it in good condition (Excavator etc.)	✓		5	4	
10	Use of Personnel Protective Equipments (PPEs) by Workers i.e. hard helmets, PPE vest, Gloves, Boots, etc	✓		5	4	
11	Is the First Aid box on site and in good condition with all the items intact /First Aider	✓		9	6	
12	Are all the laborers above age 16 working on site	✓		7	5	
13	Has potable water been provided to all the laborers	✓		3	2	
14	Help Desk: Table, Chair and First Aid with Grievance Register Available visible by Public		✓	3	0	
15	Is the ground of working site clear and secure against any possible injury?	✓		4	4	
16	Is the excavated material piled safely without earth falling into the trench again	✓		5	1	
17	Are all the excavated trenches > 1.5m depth (Trench Shored)		✓	10	0	
18	Is there any spillage of chemicals	✓		4	4	
				100	59	

There is no
 The acceptable score is 80 and above

If any item is answered with a "No", explain below

- Lack of signboard with basic information: They are in the process of preparing sign board.
- Lack of Help desk: They are in the process of putting Help Desk.
- Lack of shoring in all trenches and manhole: Trenches seem relatively stable. They have plan to do shoring in the recently excavated manhole edge.

✓
 DSC/CASSC
 Name: Asha L. Suwal
 Signature: [Signature]
 Date: 6 June 2018
 Mobile No: 9843559349

On behalf of contractor
 Name: Mohar Singh
 Signature: [Signature]
 Date: 6 June 2018
 Mobile No: _____