Government of Nepal
Ministry of Water Supply
Singhadurbar, Kathmandu

Brief Environmental Study (BES)
of
Sewer Network Development in Gokarneshwor Municipality

(Gokarneshwor Municipality, Kathmandu, Bagmati Province, Nepal)

Proposed location for Sewer Network Development in Gokarneshwor MunicipalitySewer Network Development

Submitted to:

Government of Nepal
Ministry of Water Supply
Singhadurbar, Kathmandu
Bagmati Province, Nepal

Submitted by:	Prepared by:
Kathmandu Upatyaka Khanepani Limited Project Implementation Directorate, Anamnagar, Kathmandu	DOHWA Engineering Co. Limited in association with ERMC/ TAEC Anamnagar, Kathmandu

Bhadra, 2079

Government of Nepal
Ministry of Water Supply
Singhadurbar, Kathmandu

DOHWA ENGINEERING CO., LTD
KVWMP
No.DSC06
in association with
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ABBREVIATIONS

ADB	Asian Development Bank
BES	Brief Environmental Study
CASSC	Community Awareness and Safeguard Support Consultant
CI	Cast Iron
DEWATS	Decentralized Waste Water Treatment System
DI	Ductile iron
DoR	Department of Roads
DSC	Design and Supervision Consultant
DWC	Double Wall Corrugated
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environment Protection Act
EPR	Environment Protection Rules
ERMC	Environment Resource and Management Consultant
GRM	Grievance Redress Mechanism
HDPE	High Density Poly Ethylene
HPCIDBC	High Power Committee for Integrated Development for Bagmati Civilization.
KUKL	Kathmandu Upatyaka Khanepani Limited
MoWS	Ministry of Water Supply
NEA	Nepal Electricity Authority
NTC	Nepal Telecom
PID	Project Implementation Directorate
RCC	Reinforced cement concrete
ToR	Terms of Reference
WWTP	Waste Water Treatment Plant

कार्यकारी सारांश

प्रस्तावकको नाम तथा ठेगाना

यस आयोजनाको प्रस्तावक काठमाण्डौं उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय रहेको छ ।

ठेगाना:

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पृष्ठभूमि

काठमाण्डौं उपत्यकाको शहरीकरण, नदी प्रणालीसँग जोडिएको छ । उपत्यकाका प्राकृतिक सम्पदा र सांस्कृतिक सम्पदा दुवैको संरक्षण र संरक्षणका लागि नदीहरूको संरक्षण अति आवश्यक छ। गोकर्ण क्षेत्रबाट बग्ने पवित्र बागमती नदी दिन-प्रतिदिन प्रदूषित हुँदै गइरहेको छ । त्यसैले गोकर्ण क्षेत्रमा फोहोर पानी प्रणालीको सुधार र स्तरोन्नतिको तुरुन्तै आवश्यक छ।

संक्षिप्त वातावरणीय अध्ययन (BES) को सान्दर्भिकता तथा उद्देश्य

"गोकर्णेश्वर नगरपालिकामा ढल संजालको विकास" को संक्षिप्त वातावरणीय अध्ययन (BES), वातावरण संरक्षण नियमावली, २०७७ को नियम ७ बमोजिम तयार गरिएको हो। संक्षिप्त वातावरणीय अध्ययन वातावरण संरक्षण नियमावली, २०७७ को अनुसूची-१० मा उल्लेखित ढाँचा अनुसार तयार गरिएको छ र स्वीकृत कार्यसूचि पनि पालना गरिएको छ ।

प्रस्तावको विवरण

प्रस्तावित "गोकर्णेश्वर नगरपालिकामा ढल संजालको विकास" आयोजना नेपालको बाग्मती प्रदेशको काठमाण्डौं जिल्लाको गोकर्णेश्वर नगरपालिकाको वडा नं ४ मा अवस्थित छ । यो आयोजना गोकर्ण क्षेत्रमा ६.२४ किलोमिटर ढल डिजाइन गरि निर्माण गर्न, नेटवर्क सुधार गर्न र अन्तत फोहोर पानीलाई गोकर्णमा निर्माण हुन लागेको नयाँ DEWATS मा ल्याउनको लागि प्रस्ताव गरिएको आयोजना हो। प्रस्तावित ढल संजाल आयोजनामा गोकर्णेश्वर नगरपालिकाका वडा नं १ सुन्दरीजल, वडा नं २ नयाँपाटी र वडा नं ४ गोकर्ण क्षेत्रको योगदान रहेको छ ।

अध्ययन विधि

यो संक्षिप्त वातावरणीय अध्ययन प्रतिवेदन सरकारको कानूनी आवश्यकता अनुसार स्वीकृत कार्यसूचिमा उल्लिखित प्रक्रियाहरू अनुरूप तयार गरिएको हो । सन्दर्भ सामग्रीहरुको पुनरावलोकन र स्थलगत अध्ययन मार्फत आवश्यक जानकारी सङ्कलन गरिएको थियो । प्रकाशित प्रतिवेदन, नक्सा तथा तस्बिरको अध्ययन गरी तथ्याङ्कहरु सङ्कलन गरिएको थियो । प्राथमिक जानकारी मापन, चेकलिस्ट/प्रश्नावली र स्थानीय जनता/सरोकारवाला र अधिकारीहरूसँगको परामर्श मार्फत सङ्कलन गरिएको थियो । जनताहरुसंग अन्तर्क्रिया र सुझाव संकलनको लागि २०७८/०९/२६ गते गोकर्णेश्वर नगरपालिकाको वडा नं ४ मा सार्वजनिक सुनुवाइ कार्यक्रम आयोजना गरिएको थियो । स्थानीय जनतालाई आयोजनाको बारेमा जानकारी गराउन २०७८/१०/२५ मा फोकस ग्रुप डिस्कसन कार्यक्रम पनि आयोजना गरिएको थियो । सार्वजनिक परामर्शका क्रममा प्राप्त राय सुझावहरूलाई यस BES प्रतिवेदनमा समावेश गरिएको छ ।

विद्यमान वातावरणीय अवस्था

गोकर्णेश्वर नगरपालिकामा ढल संजालको विकास आयोजना मुख्यतया काठमाण्डौं जिल्लाको गोकर्णेश्वर नगरपालिकाको वडा नं ४ मा २७°४४'२०' उत्तर अक्षांश र ८५°२३'२७' ई देशान्तर रहेको भौगोलिक स्थानमा निर्माण गरिनेछ। सेवा क्षेत्रले गोकर्णेश्वर नगरपालिकाको ३ वटा वडा (१, २ र ४) ओगटेको छ । वडा नं २ र ४ बाट धेरै योगदान सहित कुल योगदान क्षेत्र ४९५ हेक्टर रहेको छ । प्रस्तावित आयोजना क्षेत्र, अवस्थित सडकमा पर्छ र जग्गा अधिग्रहण गर्न आवश्यक छैन। निर्माण क्षेत्र कुनै पनि पर्यावरणीय संवेदनशील क्षेत्रमा पर्दैन र आयोजना क्षेत्रले कुनै जंगल, राष्ट्रिय निकुञ्ज र संरक्षित क्षेत्र समावेश गर्दैन ।

वातावरणीय प्रभावहरु

सकारात्मक प्रभावहरु

आयोजना कार्यान्वयनमा आएपछि गोकर्ण क्षेत्रको ढल संजालमा सुधार हुनुका साथै सबै ढल DEWATS मा लगेर प्रशोधन गरिने छ । गोकर्ण क्षेत्रका २५,२४० जनसङ्ख्या यस आयोजनाबाट लाभान्वित हुनेछन् । ढल संजाल कार्यान्वयनमा आएपछि गोकर्ण क्षेत्रको वातावरण स्वच्छ हुनेछ र बागमती नदीको पानीको गुणस्तरमा उल्लेख्य सुधार आउनेछ । ढलको लाइन प्रयोग गरी ढलको सङ्कलन गर्ने र ढलको सिधा निष्कासनलाई रोक्ने कार्य गरेपछि नदीको पानीको गुणस्तरमा सुधार आउनेछ र नदीको संरक्षण हुनेछ ।

नकारात्मक प्रभावहरु

निर्माण कार्यहरूले न्यूनतम वातावरणीय प्रभावहरू उत्पन्न गर्नेछन् जसलाई उचित व्यवस्थापनद्वारा न्यूनीकरण गर्न सकिनेछ। निर्माण गतिविधि, सडक बन्द, खाडल खनेर निस्किएको माटो, निर्माण मेसिनरी सञ्चालन, फोहोर उत्पादन र व्यवस्थापन, अवस्थित

भौतिक संरचनामा क्षति हुन सक्छ तर सबै नकारात्मक प्रभावहरूको न्यूनीकरण गरिनेछ।

सकारात्मक प्रभाव बढाउने उपायहरु

गोकर्ण क्षेत्रको ढलको लाइन प्रशोधनका लागि गोकर्ण स्थित DEWATSमा लगिने र प्रशोधित पानी नदीमा बगाइने छ । फोहोर पानीको प्रशोधनले नदीको पानीको गुणस्तर, पानी जन्य जीवन र जनताको स्वास्थ्य र सरसफाईमा सुधार गर्न महत्वपूर्ण योगदान पुऱ्याउँछ । साथै निर्माण कार्यको समयमा स्थानिय बासिन्दाहरुलाई रोजगारीको अवसर प्राथमिकता दिइनेछ ।

नकारात्मक प्रभाव न्यूनिकरणका उपायहरु

नकारात्मक असर न्यूनिकरणका लागि विभिन्न उपायहरु अवलम्बन गरी असर कम गरिनेछ जस्तै, धूलो कम उड्न दिनका लागि पानी छर्किने व्यवस्था गरिनेछ, खाडल खनेर निस्किएको माटो तोकिएको स्थानमा बिसर्जन गरिने, ट्राफिक व्यवस्थापन योजना बनाई पैदल यात्री तथा गाडीहरुको आवत जावतमा कुनै रोकावट गरिने छैन । कामदारको सुरक्षा र कामदारका कारण उत्पन्न हुन सक्ने असरहरुका बारेमा उचित व्यवस्थापन गर्न प्राथमिक उपचारका सामाग्री, व्यक्तिगत सुरक्षाका सामग्री, सफा खानेपानी तथा शौचालयको व्यवस्था गरिने छ ।

वातावरणीय व्यवस्थापन योजना

सम्बन्धित सरोकारवालाहरुको स्पष्ट जिम्मेवारी, लागत र समय तालिका सहितको वातावरणीय व्यवस्थापन योजना यो प्रतिवेदनमा उल्लेख गरिएको छ । यसले डिजाइन तथा सुपरिवेक्षण परामर्शदाता, आयोजना कार्यान्वयन निर्देशनालय, काठमाण्डौं उपत्यका खानेपानी लिमिटेड तथा निर्माण व्यवसायीहरुलाई यस आयोजनालाई उपयुक्त वातावरणीय हिसावले डिजाईन, निर्माण तथा संचालन गर्न निर्देशित गर्ने छ । यसलाई वोलपत्र र संझौता पत्रमा समेत समावेश गरिने छ । अनुगमन सूचकहरु सहितको एक अनुगमन संयन्त्र समेत निर्माण गरिने छ ।

निश्कर्ष

समग्रमा आयोजनाको प्रभावहरू सकारात्मक हुनेछन् जसकारण वातावरण र जनतालाई धेरै फाइदा पुग्नेछ। कार्यान्वयनको क्रममा केही नकारात्मक प्रभावहरू पर्ने सम्भावना छन् तर छोटो अवधिको लागि हुने भएकोले न्यूनिकरणका उपायहरु लागु गरिनेछ। आयोजनाको लागि नकारात्मक वातावरणीय प्रभावहरू सामान्यतया महत्त्वपूर्ण हुनेछैन र डिजाइन, निर्माण र सञ्चालन चरणहरूमा न्यूनीकरण उपायहरू र नियमित अनुगमन मार्फत कम गर्न र/वा रोक्न सकिन्छ ।

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Project Implementation Directorate Kathmandu Upatyaka Khanepani Limited Estd 2009

Government of Nepal Ministry of Water Supply Singhadurbar, Kathmandu

Executive Summary

Proponent Name and Address

The proponent of this project is Kathmandu Upatyaka Khanepani Limited (KUKL), Project Implementation Directorate (PID).

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The urbanization of Kathmandu Valley is strongly associated with the river systems. Protection of rivers is very important for protection and conservation of both natural resources as well as culture heritage in the valley. The holy Bagmati river, which is flowing through the Gokarna area, is being polluted day by day. So improvement and upgrading of wastewater systems is urgently needed in the Gokarna area.

Rationality of Brief Environmental Study (BES) and Objective

The Brief Environmental Study (BES) of "Sewer Network Development in Gokarneshwor Municipality" has been prepared pertaining to Rule 7 of Environmental Protection Rule (EPR), 2077 B.S. BES has been prepared as per the format indicated in Schedule -10 of (EPR), 2077 B.S. and has followed the approved ToR.

Description of the Proposal

Sewer Network Development in Gokarneshwor Municipality is the project package to design, construct 6.2 km of sewers in Gokarna, in order to improve the network and substantiate the waste water to bring into new DEWATS at Gokarna. The project "Sewer Network Development in Gokarneshwor Municipality" is located in ward 4, Gokarneshwor municipality, Kathmandu district, Bagmati Pradesh of Nepal. The sewer network alignment lies in ward 4, however, the contributing areas of sewer network site lies in wards 1, 2 and 4 (Sundarijal, Nayapati, and Gokarna) of Gokarneshwor municipality.

Methodology

This BES report is prepared in accordance with the legal requirements of GoN, following the procedures outlined in the approved ToR. Necessary information was collected through literature review and field study. Secondary information was collected through published reports and interpretation of maps and photographs. Primary information was collected through measurement, checklist/questionnaire and consultation with local people/stakeholders and officials. Public hearing program was organized on Gokarneshwor municipality ward no-4 office for Sewer Network Development in Gokarneshwor Municipality on 2078/09/26 B.S for the collection of

Government of Nepal Ministry of Water Supply Singhadurbar, Kathmandu

Project Implementation Directorate Kathmandu Upatyaka Khanepani Limited Estd 2009

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feedback and suggestion of the people. A focus group discussion program was also organized with the local people on 25/10/2078 B.S to inform them about the project. The suggestions received during public consultation have been incorporated in this BES report.

Existing Environmental Condition

The sewer network will be constructed mainly in ward number 4 of Gokarneshwor Municipality of Kathmandu district with geographic location of 27°44'20" N latitude and 85°23'27" E longitude. The service area covers 3 wards (ward 1, 2 and 4) of Gokarneshwor Municipality. The total contributing area is 495 ha with higher areas from wards 2 and 4. The project area lies in the existing road and land acquisition is not required. The area does not lie in any ecological sensitive area and does not comprise any forests, national parks and protected area.

Environmental Impacts

Beneficial Impact

There will be improvement in sewer network in Gokarna area and all the sewage will be transported to DEWATS after the implementation of the project. Base year population of 25,240 of Gokarna area will be benefitted from this project. This will lead to a clean environment in Gokarna area and the water quality of Bagmati river will be improved significantly. Collection of sewer using sewer line and preventing the direct discharge of the sewer will preserve ecology of the river and will maintain diversity and river ecosystem.

Adverse Impact

Construction works will produce negligible and insignificant environmental impact which can be mitigated through proper management. There may be some impact due to construction activities, road closures, spoil disposal, operation of construction machineries, generation of waste, damage to existing physical structures but will be mitigated as applicable.

Benefit Augmentation Measures

Priority to the local marginalized people will be given for the employment opportunities. The sewer line of Gokarna area will be taken to the DEWATs at Gokarna for the treatment and the treated water will be discharged to the river. Treatment of waste water will significantly contribute towards improving the river water quality, aquatic life and health and hygiene of the people.

Adverse Impact Mitigation Measures

Various mitigation measures will be adopted for reducing the adverse impacts, like water sprinkling will be done for dust suppression, excavated earthwork will be disposed at designated sites, traffic management plan will be prepared for easy access

of vehicles and pedestrians, reinstatement will be done to its previous conditions etc. For occupational health and safety, all workers will be insured and provided with personal protective equipment (PPE), clean drinking water, toilets facilities and first aid box will be kept in the work sites.

Environmental Management Plan

The Environmental Management Plan (EMP) has been prepared to ensure that all mitigation measures and monitoring requirements will actually be carried out at different stages of project i.e. Project design, pre-construction, construction and operation and maintenance. The EMP has established the roles and responsibilities of all parties involved in the project's environmental management describing mitigation measures that shall be implemented to avoid or mitigate adverse environmental impacts and maximizing the positive ones; ensuring the environment and its surrounding areas are protected and developed to meet the needs of the local people and stakeholders.

Conclusion

Overall the impacts of the Project will be very positive, benefitting the environment and the people. Some impacts are anticipated during implementation but in specific areas and for short duration. It is expected that the adverse environmental impacts of the proposed project will in general not be significant and can be reduced and/ or prevented through mitigation measures and regular monitoring during the design, construction and operation phases.

1 NAME AND ADDRESS OF THE PROPONENT AND INSTITUTION PREPARING THE REPORT

A. Introduction of the Proponent

The Proponent of this project *"Sewer Network Development in Gokarneshwor Municipality"* is Project Implementation Directorate (PID), Kathmandu Upatyaka Khanepani Limited. Kathmandu Upatyaka Khanepani Limited (KUKL) is a leading agency for implementation of water supply and wastewater management projects. The Ministry of Water Supply (MoWS) is the executing agency responsible for overall strategic planning, guidance, and management of the project. The name and address of the proponent is as follows:

Project Implementation Directorate (PID),
Kathmandu Upatyaka Khanepani Limited (KUKL),
Tankaprasad Ghumtimarg, Anamnagar, Kathmandu,
Bagmati Province, Nepal.
Tel: +977-1 5705656, 977-1 5705916, 977-1 5705771
E-mail: pidmail@kuklpid.org.np
Website: www.kuklpid.org.np

B. Name and Address of the Institution Preparing the Report

Dohwa Engineering Co. Ltd., Korea in association with Environmental and Resource Management Consultant (ERMC) and TAEC, Nepal have entered for Consultants' Services with the Project Implementation Directorate (PID), Kathmandu, Nepal on November 2018 as the Design Supervision and Management Consultant (DSC-06) for the Wastewater Management Project. This Brief Environmental Study document has been prepared on behalf of the project proponent by the DSC-06. The name and address of the consultancy is as follows:

DOHWA Engineering Co. Ltd in association with Environmental and Resource Management Consultant (ERMC) and TAEC,
Tankaprasad Ghumtimarg,
Anamnagar, Kathmandu,
Bagmati Province, Nepal.
Tel: +977-15705884
Email: dohwa2018@gmail.com

2 SUMMARY OF THE PROPOSAL

A. General Information

The urbanization of Kathmandu Valley is strongly associated with the river systems. Rivers in the valley have very high value for natural resources and human settlements in the basin. Beside of those, most of the important temples, shrines, etc. are located in the river banks. Therefore, protection of rivers is very important for protection and conservation of both natural resources as well as culture heritage in the valley. Kathmandu Valley Wastewater Management Project has been launched and funded by the Government of Nepal (GoN) and the Asian Development Bank (ADB) for improving the wastewater services in the Kathmandu Valley. The project is expected to maximize the efficiency and effectiveness of existing wastewater sector infrastructures and service provision through restoration, establishment and extend wastewater services in order to improve urban rivers and tributaries water quality and ecosystem. The project comprises of the development of neighbourhood sewer network improvement and expansion of interceptor sewers and wastewater treatment plants. The resultant synergy is expected to lead to increased efficiencies, greater improvement in service delivery and higher impact on health outcomes and quality of life for inhabitants of Kathmandu Valley.

Sewer Network Development in Gokarneshwor Municipality is the project package to design, construct and rehabilitate the sewers in Gokarna, Gokarneshwor Municipality in order to improve the network and substantiate the waste water to bring into the decentralized wastewater treatment plant which is being constructed at Gokarna. The DEWATS at Gokarna is a separate project package that will be of the capacity of 3 MLD and will be constructed using Moving Bed Bio Reactors (MBBR) technology. The contract package "Sewer Network Development in Gokarneshwor Municipality" (KUKL/WW/SN-04) is under Kathmandu Valley Wastewater Management Project (KVWMP).

B. Relevancy of the Proposal

Gokarneshwor Municipality along with Kathmandu district is being in the phase of rapid and unplanned urbanization and industrialization without adequate infrastructure development. Melamchi Water Supply Project will bring in 170 MLD water from Melamchi River to Kathmandu Valley in the first phase which will ultimately increase the flow of wastewater. Currently the proposed area is also suffering from the lack of good sewer network system. The holy Bagmati river, which is flowing through the Gokarna area, is being polluted day by day. So improvement and upgrading of wastewater systems is urgently needed in the Gokarna area. Sewer Network Development in Gokarneshwor Municipality will collect sewer water from Gokarna area and convey it into the wastewater treatment plant and discharge relatively clean water to Bagmati river.

Government of Nepal Ministry of Water Supply Singhadurbar, Kathmandu

Project Implementation Directorate Kathmandu Upatyaka Khanepani Limited Estd 2009

DOHWA ENGINEERING CO., LTD. KVWMP No.DSC06 in association with ERMC

So the network to collect and transport/convey wastewater to the treatment plant facility is essential. Land acquisition or dislocation of any private and public structures is not required for the construction of this project. Rather, there will be positive impacts in health of the local community because of the sewer water management and ultimately improve the quality of life.

C. Rationality of Brief Environmental Study

As per provision of the Government of Nepal Environmental Protection Acts (EPA), 2076 B.S and Environmental Protection Rule (EPR), 2077 B.S Environmental Assessment (EA), whether it is Brief Environmental Study (BES), Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA) is mandatory for development of any projects and the implementation of proposal without its approval is prohibited. The clause 15 of EPA also prohibits everybody from polluting; that will cause significant adverse impact on the environment. Similarly, ***"Working on Drainage, Sanitation, or Waste Management aimed at supporting a population up to 50,000" (Base year population) / "५०,००० जनसङ्ख्या (आधार वर्ष) सम्मलाई टेवा पुऱ्याउने उद्देश्यले सञ्चालन हुने ढल निकास, सरसफाई वा फोहरमैला व्यवस्थापन कार्य गर्न"*** needs to go through Brief Environmental Study ***(संक्षिप्त वातावरणीय अध्ययन)*** as per the Schedule 1-I under Waste Management Sector (2), (Schedule revised on 2078/02/10) pertaining to Rule 3 of EPR 2077 B.S.

As the proposed project is for construction of sewer network at Gokarna for population 25240 (*twenty five thousand two hundred and forty*), so Brief Environmental Study (BES) and its approval prior to implementation of proposal are mandatory. The Term of Reference (ToR) for this "Sewer Network Development in Gokarneshwor Municipality" BES was approved on 2078/03/30 B.S by the Ministry of Water Supply (MoWS). The present Brief Environmental Study (BES) of "Sewer Network Development in Gokarneshwor Municipality" has been prepared pertaining to Rule 7 of Environmental Protection Rule (EPR), 2077 B.S. BES has been prepared as per the format indicated in Schedule -10 of (EPR), 2077 B.S. and has followed the approved ToR.

D. Objective of Brief Environmental Study

The general purpose of this Brief Environmental Study is to examine the proposed sewer network project to ensure that they will not have significant environmental impacts. The specific objective includes the following:

- To document necessary baseline conditions of physical, biological, socio-economic and cultural environments of project area;
- To familiarize various stakeholders with the BES process and its outcomes through public consultation and participation programs and to incorporate their relevant concerns and issues in environmental mitigation plan;
- To identify the potentially significant environmental impacts and its risks on the proposed project and also identify their appropriate mitigation measures to help mitigate/minimize the adverse impacts;
- To prepare an environment management and monitoring plan;
- To ensure that the project is implemented in an environmentally sound manner.

E. Information of Proposed Project

The proposed project "Sewer Network Development in Gokarneshwor Municipality" is located in ward 4, Gokarneshwor municipality, Kathmandu district, Bagmati Province of Nepal with geographic location between 27° 42' 38" N and 27° 49' 2" N Latitudes and 85° 21' 50" E and 85° 28' 17" E Longitudes. The contributing areas of the sewer network are (Sundarijal, Nayapati and Gokarna) of Gokarneshwor municipality. The sewer network alignment lies in ward 4, however, the sewer capacity in main pipeline is also considered for wards 1 and 2. The total contributing area is 495 ha. Most of the areas of ward 4 are served with this package (KUKL/WW/SN-04). Salient feature of the proposed sewer network project and its location maps are given below.

Table 2-1: Salient Features of Sewer Network Development in Gokarneshwor Municipality

S.N	Particulars	Description
1.	Name of the Project	"Sewer Network Development in Gokarneshwor Municipality"
2.	Location of the Project	
	Province	Bagmati Pradesh
	District	Kathmandu
	Municipality	Gokarneshwor Municipality, Ward no 4
3.	Contributing Area	495 ha (Ward Number 1, 2 and 4 of Gokarneshwor Municipality)
4.	Population Coverage	Base Year Population (2023): 25,240
		Design Year Population (2053): 76,980
5.	Sewer Network Components	DWC Plastic Pipes, RCC Pipes, Manhole, Overflow Structure, Sewer Outfall, Aqueduct, River training works, Household Connections
6.	Sewer Network Alignment	Ward 4 of Gokarneshwor Municipality
7.	Length of Sewer Network	6.2 Km
8.	Excavation Depth	1.26 km have 1-2 meters, 3.49 km have 2-3 meters, 1.14 km has 3-4 meters and only 0.35 km has 4-4.8 meters depth of excavation
9.	Proponent	Kathmandu Upatyaka Khanepani Limited / Project Implementation Directorate
10.	Funding Agency	Government of Nepal and Asian Development Bank (Gokarneshwor Municipality will bear 10% and PID will bear 90% of the total cost during the construction phase)
11.	Contract Duration	540 days
12.	Manpower Required	21,600 (40*540)

Figure 2-1: Location Map of Sewer Network Development in Gokarneshwor Municipality

Figure 2-2: Administrative Map of Gokarneswhor Municipality

F. Design Criteria and Considerations

The wastewater is conveyed from the place of its production to the treatment plant through a separate sewer network of household connection pipes, lateral (tertiary), branch and trunk sewers. The branch and lateral sewers collects wastewater from the neighbourhood area and conveys it to the trunk/collector sewer and finally convey it to the wastewater treatment plant. Partial storm water that has been collected with the system will finally be treated with primary treatment plant with primary sedimentation tank and disinfection during rainfall period. The storm water from the area will be drained through side channels of roads to the nearby stream or river. Therefore, the designed sewers would thus carry the dry weather flow and partial storm water during rainfall period. *(Source; Detailed Design Report of Sewer Network Development in Gokarneshwor Municipality: KUKL/WW/SN-04)*

Design Horizon

Sewers are usually designed for the maximum expected discharge to meet the requirements of the ultimate development of the area. Most public wastewater facilities are designed for a minimum of 20 years of service life. It is recommended to adopt the design horizon of 30 years starting from 2023 until 2053. The sewerage network is thus proposed to be designed with base year of 2023 and the design year of 2053. However, mechanical and electrical components have a shorter economic life of 5-15 years depending on the equipment.

❖ **Service/Contributing Area and Population Coverage**

The contributing area lies in three wards of Gokarneswor Municipality which have mostly higher density of population. These are the ward 1, 2 and 4. The basis of the population estimation of the project area is the 2001, 2011 and 2021 census population. The census population of the service area is 12191 in 2001, 17317 in 2011 and 24394 in 2021. Therefore, the future population of the service area has been estimated using the logistic growth method based on the census population and future saturation population density. The population of service area in 2023 (base year) is 25240 and in year 2038 and 2053 will be 46000 and 76980 considering fully covered in ward no. 2 and 4 and partly (about 80%) covered in ward no.1. (Source; Detailed Design Report of Sewer Network Development in Gokarneswor Municipality: KUKL/WW/SN-04). The demarcation of the contributing area is based on the survey map, existing sewer networks, contour maps, their flow directions and site visit. The total contributing area is 495 ha. with higher areas from wards 2 and 4 (about 41% and 38%). The service/contributing area and coverage of proposed sewer network are given below.

Table 2-2: Service/Contributing Area of Sewer Network

Service/Contributing Wards	Ward Name	Area (ha)	%
1	Sundarijal	105	21%
2	Nayapati	200	41%
4	Gokarna	189	38%
Total		495	100%

(Source; Detailed Design Report of Sewer Network Development in Gokarneshwor Municipality: KUKL/WW/SN-04)

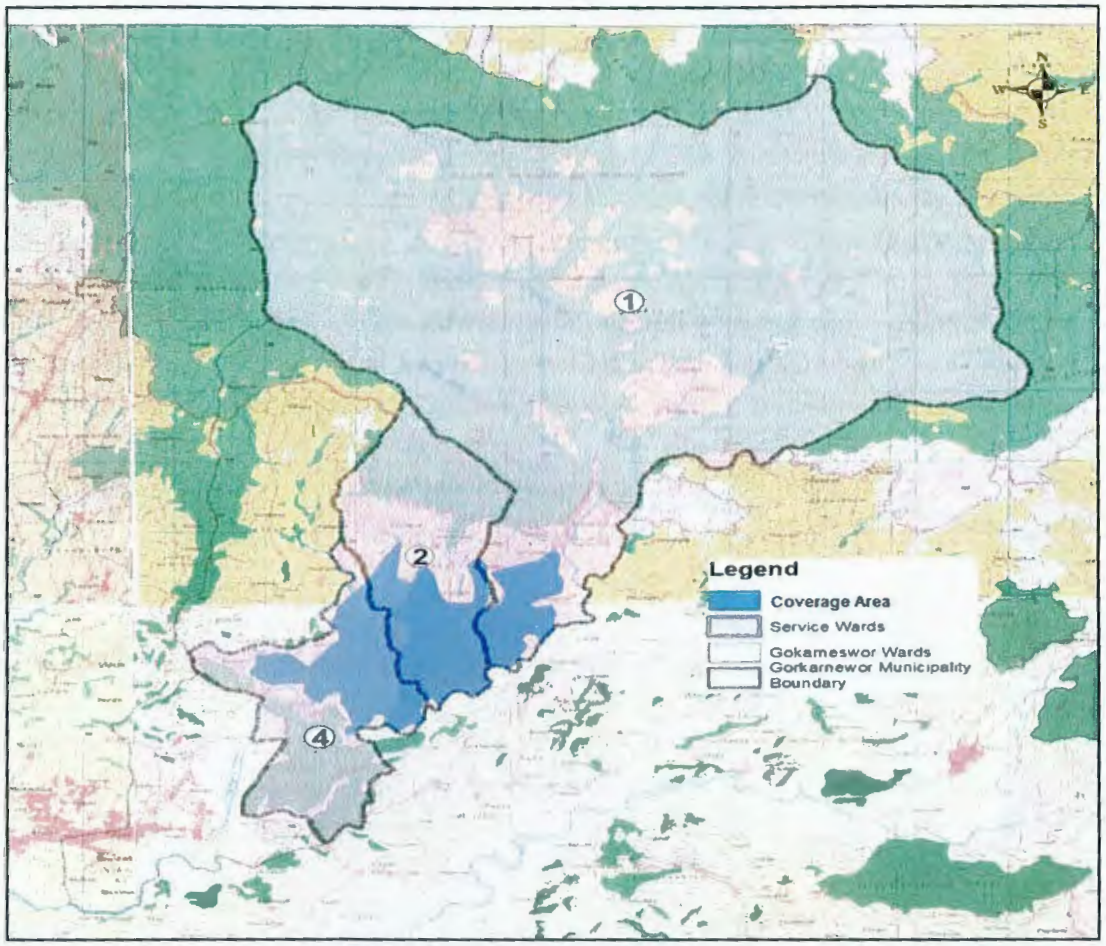

Figure 2-3: Service/Contributing Area

❖ **Wastewater Quantity**

The quantity of domestic wastewater is calculated using water supply rate at 100 liters per person per day in the years 2023 A.D, 120 liters per person per day in 2038 A.D and 135 liters per person per day in 2053 A.D. Considering the return factor of 80% i.e. 80% of the water consumption (135 lpcd) becoming sewage flow, the per capita domestic wastewater generation will be 108 l/d in the year 2053. Maximum quantity of wastewater is calculated taking peak factor of 2.5. Minimum quantity of sewage is taken as 30% of the average quantity. Nondomestic wastewater quantity and infiltration are assumed as 10% of domestic wastewater each. The total average and peak dry weather flow (DWF) is shown in table below..

Table 2-3: Total Average and Peak Dry Weather Flow (DWF)

Year	Avg DWF	Peak DWF
2038 A.D	70 lps (6 MLD)	157 lps (13.6 MLD)
2053 A.D	116 lps (10 MLD)	261 lps (22.6 MLD)

The total average and peak dry weather flow (DWF) in the year 2038 are 70 lps (about 6 MLD) and 157 lps (about 13.6 MLD) respectively, where as in 2053, the average flow will be 116 lps (10 MLD) and peak will be 261 lps (22.6 MLD).

❖ Alternative Route Assessment

At the downstream of Uttarbahini Temple, an alternative route has also been assessed. The alternative route is on the southern side of Bagmati River along the boundary of forest area. The sewer route will cross the Bagmati River at two locations. The first one crosses Bagmati River from north to south nearby Uttarbahini Temple and the second one crosses again Bagmati River from South to North. As the forest area is elevated land, deep excavation (>6.5 m) is required on this section. The route has advantage of having less probability of hindrances during construction, but, the main disadvantage of this alternative is that it obstructs the river flow at the two locations. The first obstruction is more severe because there will be less clear opening for river water to flow. If the river crossings are constructed under the bed level, the depth of excavation along the downstream is too high upto 8m. Technically this alternative is less appropriate than the proposed sewer route.

❖ Selection of Sewer Route

The site reconnaissance surveys were carried out with municipality technical persons, PID and consultants. The possible routes were determined as due consideration of social issues, natural flow path, condition of roads etc. As per topography, the service area is elevated towards north and it is sloped towards rivers. The route is selected in such a way that the sewage will flow naturally in gravity to the treatment plant. All the pipes will be laid either along the road or along the river bank (public land). The main pipe line runs through the newly constructed road starting at the Syalmati Khola bridge, following southern road of Naidol dense community and along right side of Bagmati river on the earthen road and passes through the Bagmati river bank about 400m until it enters to the treatment plant in front of Dese Bridge. The second main line starts from the Jorpati – Sundarijal road near Suryamati Bridge and just few meters downward of the bridge, it passes to the treatment plant area to meet with main line 1. The secondary pipelines collect sewage from branch line and household connections. Secondary lines and branch lines are also aligned on the existing blacktopped and earthen roads. The roads are found to be greater than 3 m width. Main roads and newly constructed gravel roads are 6 m wide while the earthen roads are more than 3 m width. In Chandramati section there is blacktop and concrete road throughout the alignment, road is about 4 to 6 meter wide. In Kolamati section there is about 6 meter wide earthen road from main road up to Bagmati river. The proposed sewer route and layout map of the project covering all the areas along the routes is given in figure below.

Figure 2-4: Proposed Sewer Route/Sizes

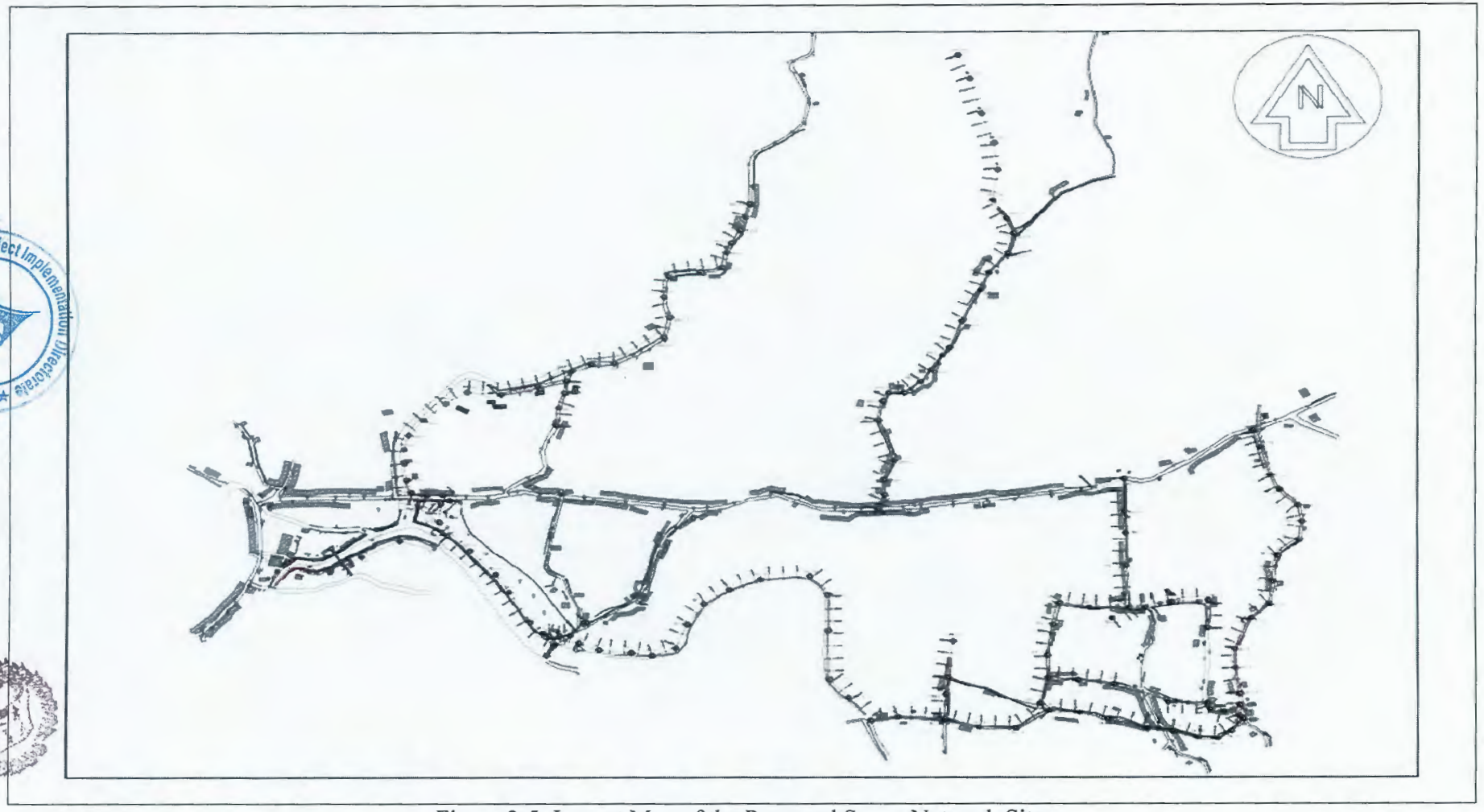

Figure 2-5: Layout Map of the Proposed Sewer Network Site

❖ Collector Flows

Collector sewers are the sewers laid to collect the wastewater from the sewerage network and conveyed to the wastewater treatment plant. The storm water from the sewerage network will be overflowed to the nearby stream or river through the overflow/diversion structures. The collector sewers would thus carry the dry weather flow.

❖ Pipe Lines

The total length of sewer pipes line in proposed project is 6.2 Kms. The stretches of pipes are categorized in three groups, viz; branch lines, secondary line and main lines. There will be 1027 m of branch line, 2652 m of secondary line and 2128 m of main line. Besides, there will be 432 m of effluent line, to convey the treated wastewater along the Bagmati river upto downstream of Gokarneshor Mahadev temple. DWC Plastic pipes and RCC pipes of 0.2 m Φ (13.7%), 0.3 m Φ (12.7%), 0.4 m Φ (16.7%), 0.5 m Φ (23.1%), 0.6 m Φ (20.9%), and 0.8 m Φ (12.9%) will be laid in this project, in which the longest length of pipe size will be 5 m (about 1.43 km) and shortest length of pipe will be 0.8 m dia (about 0.8 km). The summary of sewer length and depth of excavation for the pipeline are given in the table below.

Table 2-4: Summary of the Sewer Length

Sewer Type	**Diameter (m)**						**Grand Total (m)**
	0.2	**0.3**	**0.4**	**0.5**	**0.6**	**0.8**	
Branch Line	478	77	427	-	-	-	982
Secondary Line	370	655	607	998		-	2630
Main Line	-	56			1295	800	2151
Effluent Line	-	-		432	-	-	432
Grand Total (m)	**848**	**788**	**1034**	**1430**	**1295**	**800**	**6195**

Sewer line starts with small size of 200 mm diameter whose total length is 0.85 Km and the largest pipe dia is 800 mm with 0.80 Km length. Sewers will be laid for main line of about 2.15 Km, secondary line of about 2.63 Km and branch line of about 0.98 Km. Summary of the sewer length is given in the table below.

Table 2-5: Summary of the Depth of Excavation

S.N	**Diameter**	**Depth of Excavation (m)**				**Total Length (m)**
		1-2	**2-3**	**3-4**	**4-5**	
1.	0.2	617	185	46		848
2.	0.3	79	598	-94	17	788
3.	0.4	241	679	114		1034
4.	0.5	642	594	84	110	1430
5.	0.6	201	945	149		1295

6.	0.8	305	336	150	9	800
Total Length of Sewer		**1263**	**3489**	**1136**	**351**	**6195**

Out of the 6.2 km total sewer length, 1.26 km of sewers have 1-2 meters of depth of excavation, 3.49 km of sewers have 2-3 meters of depth of excavation, 1.14 km has 3-4 meters and only 0.35 km has 4-4.8 meters depth of excavation.

❖ Pipe Materials and Joints

Double wall corrugated (DWC) PE pipes will exclusively be used for 0.2 to 0.8 m diameter sewers with spigot and socket ends, jointed through rubber gaskets. Reinforced Cement Concrete (RCC) pipes, NP3 with spigot and socket ends, jointed through rubber gaskets will be used for replacing existing sewers, overflow systems, aqueducts and effluent conduit. The minimum soil cover provided above the crests of the sewer pipe is 1.0 m.

❖ Manholes

Manholes of circular shape have been proposed at each sewer junction or change of sewer direction, diameter or gradient and at a spacing not exceeding 60 m. RCC manholes are used mainly for the main line where the traffic load is high and where the pipe diameter is greater than 400 mm. Brick manholes are used for secondary and branch lines particularly in the narrow roads. Drop manholes are proposed of Reinforced Cement Concrete (RCC) pre-cast or cast in situ. Cast Iron (CI) manhole cover and frame; heavy or medium duty is used for covering manhole. Manhole cover is engraved with "KUKL PID" for easy identification. Four types of Brick masonry and two types of precast RCC manholes are proposed. Altogether 157 numbers of manholes have been proposed. Brick manholes are 18, Precast RCC manholes are 129 and drop manholes are 10 in numbers. The summary of the manhole is given in the Table 2-6 below.

Table 2-6: Summary of Manhole

Manhole Type/Location	**Manhole Diameter (mm)**	**Pipe Diameter (mm)**	**Manhole Depth (m)**	**Manhole Numbers**	**Total %**
Brick Manhole					
Type – I (Brick MH)	900	200-450	< 1.65	18	12%
Subtotal				18	
RCC Manholes					
Type –I RCC	1200	200-600	< 3	107	68%
Type –II RCC	1500	650-1000	< 5	22	14%
Subtotal				129	
RCC Drop Manholes-				5	3%

Type I					
RCC Drop Manholes-Type II				5	3%
Total				157	

❖ Overflow Structure

About 10 numbers overflow structures to connect laterals will be provided at the ends which will covey sanitary sewage to the proposed main sewer manhole and the overflow to river. One overflow pipe will be provided on the main manhole to discharge excess flow from the system.

❖ Household Connections

A connection chamber or service pit is to be constructed adjacent to the boundary of property so that house connection can be made at any time in the future. Also, stub pipes will be to be incorporated in selected manholes to facilitate system extension and property connection of possible future development and also at space constraint for construction of chambers.

❖ Flushing

It is necessary to size the sewer to have adequate velocity for the peak flow to be achieved at the end of design periods, so as to avoid steeper gradients and deeper excavations. In such situations flushing arrangements may be provided in the initial years. The decision regarding provision of suitable slope and/or flushing arrangements will be made based on the site conditions.

❖ Sewer Outfall

The overflow structure has been proposed to convey the sanitary sewage into the sewer while overflowing the storm water into the Bagmati river. Stone Masonry outfalls with apron on the banks of the river have been proposed. Flap gates are proposed to be installed at the outfall to prevent the backflow of river water in the sewer where the flood level is higher than the connecting pipe level.

The major components of the sewer network are given in the Table 2-7 below.

Table 2-7: Components of Sewer Network

S.N	Components	Description	Remarks
1.	Pipeline	Plastic DWC and RCC pipes of 0.2 m Φ (13.7%), 0.3 m Φ (12.7%), 0.4 m Φ (16.7%),0.5 m Φ (23.1%), 0.6 m Φ (20.9%), and 0.8 m Φ (12.9%)	

2.	Manhole	Brick masonry (18), RCC (129), RCC Drop (10)	
3.	Manhole Cover	Cast Iron	Engraved with "KUKL PID", "Sewer" and "YEAR
4.	Overflow Structure	10	
5.	Household Connection	connection chamber / service pit	constructed adjacent to the boundary of property (spacing 20m or 30m)
6.	Flushing	10	
7.	Sewer Outfall	Stone Masonry Outfalls (6)	

G. Execution Methodology

❖ Width of Trench

The width of trench for sewer will be adequate for laying and jointing operations. The trench width at the bottom of the pipe will not be less than 450mm or more than 600mm greater than the outside diameter of the pipe.

❖ Depth of Trench

The trench will be excavated to a sufficient depth below the underside of the pipe. The depth of the bedding below the pipe for all type of bedding will not be less than 100 mm for pipe smaller than 450 mm and will be at least of 150 mm for pipes greater than 450mm.

❖ Excavation and Stacking Materials

Excavation for sewer trenches for laying sewers will be in straight lines. The material excavated from the trench will not be deposited close to the trench to prevent the weight of the materials from causing the sides of the trench to collapse. The sides of the trench will be supported by shoring where necessary to ensure proper and speedy excavation. Excavation methods depend on the width of roads, space availability and condition of existing structures and place of importance.

Based on the difficulties in construction work, the routes for pipe alignment are divided into two types of area i) Area 1: the general routes where the road is wide 4.5 to 6 m or greater and space is available for accessing machines, and ii) Area 2: the narrow road of width 3.5 to 4.5 m. The excavation method used for sewer trench is given below.

For all Areas;

i) Before excavation, pumps and convey pipes will be arranged to convey sewage to downstream manholes.

ii) Materials from excavated trench will be stacked to the nearest open space.

iii) In case the presence of water is likely to create unstable soil conditions, a well point system erected on both sides of the trench shall be employed to drain the immediate area of the sewer trench prior to excavation operation. A well point system consists of a series of perforated pipes driven into the water bearing strata on both sides of a sewer trench and connected with a header pipe and vacuum pump.

iv) All excavations left unattended will be adequately protected with approved fencing and barricades and with flashing lights where required.

In case of Area 1;

i) The excavation of trenches for pipelines will be done mechanically using appropriate equipment and some portion by manually.

ii) The excavation of trench will be carried out in section of 50 to 100 m or the stretch for which at least two DWC pipe can be installed.

In case of Area 2;

i) The excavation of trenches for pipelines will be done half mechanically and half manually using appropriate equipment. Small equipment and vehicle will be used especially back hoe for excavation, small tipper trucks, compactor vibration machine etc. Hand ramming is proposed for compaction and small vibration machine is allowed in these areas.

ii) The excavation of trench will be carried out for every 8 to 25 m for at least one DWC pipe to be installed.

❖ **Shoring, Sheeting and Bracing**

For wider and deeper trenches, a system of wall plates (Wales) and struts is commonly used. Continuous sheeting will be provided outside the wall plates to maintain the stability of the trench walls. The number and the size of the wall plates will be fixed considering the depth of trench and type of soil. The cross struts will be fixed in a manner to maintain pressure against the wall plates. In non-cohesive soils combined with considerable ground water, it may be necessary to use continuous interlocking steel/wood sheet piling to prevent excessive soil movements by ground water percolation. Such sheet piling will extend 1.5 m below the trench bottom unless the lower soil strata are adequately cohesive.

❖ **Diversion of Existing Sewers**

The construction of new sewer can be started from downstream to upstream. The upstream/ downstream manholes of the working section will be plugged. The temporary bypass pump has to be set. Hoist or flexible pipes will be used for conveying sewer accumulated in the upstream to the downstream.

❖ **Disposal of Surplus Material**

All the excavated spoil and construction materials will be removed completely from the construction area to avoid dust that may generate with the plying of vehicle along backfilled trench. The surplus excavated material of around 7,426.37 m^3 will be disposed off at designated and stabilized sites set after coordination with representative from relevant wards and Gokarneswor Municipality, in an environmental friendly manner. Where required, drains will be constructed to prevent the undesirable accumulation of water in or around spoil dumps.

Figure 2-6: Proposed location for Spoil Disposal

H. Traffic Management

Traffic management plans will be developed for key areas along the construction site with coordination with traffic police and will be in place prior to the excavation. Coordination will be done with traffic police to divert local traffic. Adequate signage boards will place to manage traffic in order to divert vehicles plying at the excavation site. Steel plates or other temporary materials will be used across trench facilities in key areas such as footpath; arrange for pedestrian access and sidewalks and parking areas;

and arrange for night-time construction for activities in congested or heavy day-time traffic areas will be done.

Onsite "grievance handling" will be arranged. Trench closure and rehabilitation will be carried out as quickly as feasible. Permission from the Department of Roads (DoR) for digging in the main urban roads and from the municipalities for digging in inner urban roads will be obtained.

I. Construction Materials

Construction materials required for the construction of sewer network are grave-sand mix (2954.84 Cum), granular materials (390.70 Cum), fill material (482.04 Cum), crushed stone and stone/sand mixtures (895.10 Cum), coarse grained soil filling (2954.84 Cum), crushed stone base course (1082.95), flat brick (706.10 Sqm), asphalt concrete (341.50Cum), flag stone (36.00 Sqm) and rebar (7214.98Kg). Construction materials will be purchase and bring at the site form the locally available source as per the employer's requirement.

J. Construction Activities

Temporary construction facilities such as workers' camp, parking for construction vehicles, storage of machinery/equipment/materials/fuel and extra spoil dumping area are required. The temporary construction could be done in the area at the other side of the river of the existing DEWATS facility. The land is within the ownership of HPCIDBC. Prior to the start of construction and establishment of labor camp, the details of the construction activities and about the land for the temporary construction shall be mentioned in construction EMP. Other construction activities for construction and operation and maintenance phase are listed below;

Construction Phase

- Earthwork and excavation for the sewer trenches /laying of sewer pipelines
- Drilling
- Stockpiling of construction materials
- Construction of manholes (brickwork, plastering, concreting etc.)
- Backfilling of trenches
- Compaction of trenches
- Reinstatement of the road
- Disposal of excavated spoil into approved tipping site along the alignment,
- Movement and parking of construction vehicle,
- Cement store house and proper use of cement and other chemical compounds,
- Connection of side drains and managing its outlet
- Mixing, transporting, compaction and curing of concrete

Operation and Maintenance Phase

- Cleaning and maintenance of systems

Figure 2-7: Proposed location for temporary facilities

K. Project Area Delineation

The project zone of influence is defined on the basis of perceived direct and indirect impacts due to the project activities. The areas where the sewer network will be constructed and the area adjacent to it up to 25 m both side along the sewer alignment is defined as core area. Area that might inadvertently be affected by the project activities (200 m surrounding area from project boundary line) and also due to transportation of heavy loaded construction vehicles is considered as surrounding area. Hence, the impact area is defined as:

Table 2-8: Project Area Delineation

Zone of Influence:	**Area Delineation**
Direct Impact Area (Core Area)	The areas where the sewer network will be constructed and the area adjacent to it up to 25m both side along the sewer alignment in ward-4 of Gokarneshwor Municipality.
Indirect Impact Area (Surrounding Area)	Area that might inadvertently affected by the project (200 m surrounding area from project boundary area) activities and also due to transportation of heavy loaded construction vehicles.

Pic 1: Route of Proposed sewer line along the earthen road (nearby Kolmati Khola)

Pic 2: Route for proposed sewer line

Pic 3: Earthen road for proposed sewer line along Bagmati River

Figure 2-8: Pictures of the Proposed Sewer Network Site

(Note; Source; Detailed Design Report of Sewer Network Development in Gokarneshwor Municipality: KUKL/WW/SN-04)

3 DESCRIPTION OF THE PROPOSAL

A. Objective of the Proposal

The main objective of the proposed project "Sewer Network Development in Gokarneshwor Municipality" is to collect sewer water at Gokarna area and to convey it into the future wastewater treatment plant at Gokarna and ultimately discharge clean water to the Bagmati river. This project is expected to raise the sewer services in the selected areas of Gokarneshwor Municipality, thereby cutting dispose of sewage to Bagmati River enhancing clean water in the river.

B. Description of the Existing Environment

This section describes the geo-physical, cultural, biological, and social and economic conditions of the Project Area. The information presented in this chapter is section is based on field survey, stakeholder meetings, public consultation, public hearing, and secondary data on bio-physical, ecological, social and other relevant information.

Physical Environment

Brief descriptions of the physical environmental characteristics of the sewer alignment area are presented in following sub-sections.

❖ Topography

Gokarneswor Municipality is on the north of Kathmandu valley on the lap of Shivapuri Hills. It is located at elevation range from 1320 to 2200 meters above sea level. As the hill starts from this area, the topography is irregular (level varies from 1323m to 1361m) with depressed land nearby rivers and elevated land upstreams. The service area is elevated land having steep gradients; however, some places are depressed which has created problem in gravity flow. .

❖ Climate

Kathmandu district lies in the sub-tropical cool temperate zone where the climate is fairly temperate with maximum of 35.6°C in April and minimum of 3°C in January. The temperature generally lies between 19°C to 27°C in summer and 2°C to 20°C in winter. The annual average humidity is 75% and the mean annual precipitation is 1465 mm. The average precipitation for the monsoon period is 778 mm while for the winter is 26 mm.

❖ Surface Geology

The geology of Kathmandu Valley is that it was once a lake. The valley is filled up with sediments from nearby hills. Finer sediments such as sand silts came from northern part of the hills and filled mostly the northen half. Conglomerates comprising pebbles and clay, and di-atomous earth are found in the southern part of the hills of the valley. Carbonaceous black clay locally called Kalimati and used as fertilizers by farmers has filled the central core of the valley while it was a lake. The fluvia faces are

characterized by granular sediments comprising sands silts. The valley deposit is of fluvio lacustrine nature belonging to Pleistocene era. It is believed that the bed rock of the valley is largely of metamorphic rock of Precambrian age. Sewer alignment consists of three types of soil namely, colluvium, residual and alluvium. Residual soil deposits are dominantly found throughout the alignment.

❖ River System

River that flows near to the proposed project area is Bagmati River. Gokarneshwor temple is famous shrine in Kathmandu that is located in its bank. The Bagmati River is the principal river of Kathmandu district comprising of 57 rivers and rivulets as its tributaries flowing in different districts. It originates at Baghdwar; about 15 km northeast of Kathmandu in Shivapuri hill and drains out through the Chobhar gorge in Kathmandu. After origin of Bagmati River from Shivapuri Hills, small tributaries are connected to the river as shown in the figure below.

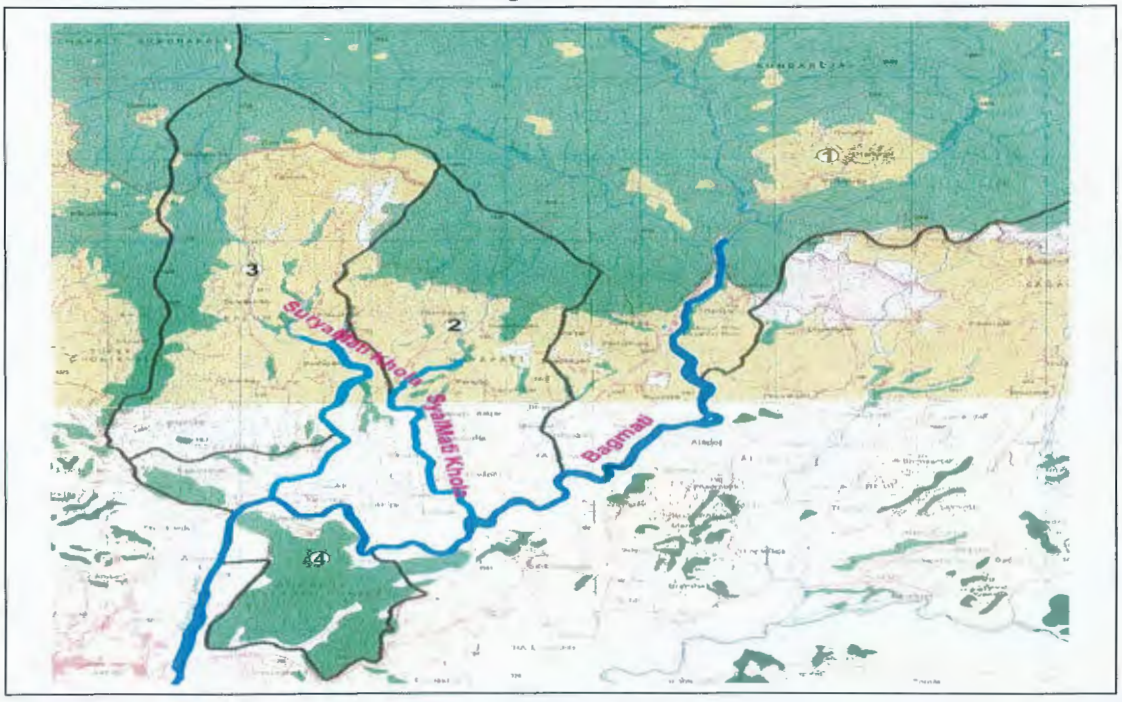

Figure 3-1: River System of Gokarneswhor Municipality

On the southern part of service area, Bagmati river is flowing and on the western side of the service area, Suryamati (Gatte Khola) is flowing down collecting water from Baluwa and Nayapati area. These two rivers i.e Bagmati and Suryamati meet just downstream of treatment plant DEWATS and flow downwards passing along the Gokarneswor Mahadev temple. Suryamati and small streams like Syalmati Khola collect water from Baluwa and Nayapait areas and transport to Bagmati river downstream. Another small stream called Kolamati Khola also flows on the eastern side of service area. These small streams have intrusion from human and animal waste (due to poultry farm). On the upstream side of these streams, there is activity of sand extractions and this activity has deteriorated water quality adding huge amount of sediments .

❖ Ambient Air

Project area has observed rapid urbanization and population growth in last few decades. There is no industrial activity around the project area but due to the vehicular activity suppressed dust particles and different gases are being emitted and contributing to air pollution. Department of Environment has allocated some air quality monitoring stations and placed air sampler in different location. The air quality monitoring station at Shankhapark (5.9 km from the proposed project area) show that the 24 hour average Total Suspended Particulate (TSP) value is 50.176 µg/m³, 24 hour average PM10 value is 43.237 µg/m³ and 24 hour average PM2.5 value is 34.546 µg/m³ (*Source: http://pollution.gov.np/, Feb 15 2021*).

❖ Noise Level

At the present the noise and vibration is not so significant at the project area. The instantaneous noise level data at the site premises is about 53 dBA measured at a particular time of a day and the noise level reaches to 77 dBA during the time of heavy vehicle movement.

Biological Environment

The project area does not lie in any ecological sensitive area and does not comprise any forests, national parks and protected area. The proposed location of sewer network is situated within the core area of Gokarneshwor Municipality of Kathmandu. No significant aquatic life in the present days can be identified in river and stream especially during dry season when there is no flow of river water and major flow comprise sewage directly disposed from sewer network (*Mehta, K. R., & Kushwaha, U. K. S., 2016).*. Based on the site visit and consultation of public outcomes different types found flora and fauna are given below.

❖ Flora

The locally found flora are Utis (*Alnus nepalensis*), Kapur (*Cinnamomum camphora*), Bottle brush (*Callistemon rigidus*), Lapsi (*Choerospondias axillaris*), Peepal (*Ficus religiousa),* Dhupi (*Juniper Spp.*), Aasare phool (*Lagerstroemia Spp.*), Jacaranda (*Jacaranda mimosifolia*), Bamboo (*Bambusa Spp.*), Bakaino (*Melia azedarach*), Painyu (*Prunus cerasoides*), Ainselu (*Rubus ellipticus*), Narkat (*Arundo donax*), Titepati (*Artemisia vulgaris*), Kuro (*Bidens biternata*).

❖ Fauna

As reported by the locals birds like Red-vented bulbul (*Pycnonotus cafer*), Spotted dove (*Streptopelia chinensis*), Sparrow (*Passeridae), Parrots (Psittaciformes),* Pigeons *(Columdidae)* and Crow (*Corvus splendens)* are seen in the project surrounding area. Some local animals like Cattle (*Bos Taurus*), Dog (*Canis lupus familiaris*), Cat (*Felis catus*), Goat (*Capra aegagrus hircus*), Buffalo (*Bubalus bubalis*) are found near the project area. The river and stream near the proposed project does not comprise any significant aquatic species.

Socio Economic and Cultural Environment

The socio-economic profile of the project areas is described below:

❖ Demographic Composition

The basis of the population estimation of the project area is the 2001, 2011 and 2021 census population. The service area lies in Ward No 1, 2 and 4 of Gokarneshwor Municipality. The land coverage of these wards is 4665 ha. According to census, the total population of these wards in the year 2001 is 12,191, 2011 is 17,317 and in the year 2021 is 24,394 with growth rate of 3.5% (2011 to 2021). Average population densities are less than 23 persons per ha and the settlement are scattered. Most of the areas are open lands, forest and farm land. The rapid growth trends in these wards are found to be nearby the main roads majorly the Jorpati- Sundarijal road and connected wide branch roads. Population growth is mainly caused by effect of immigration from suburbs to central area and new immigrants. The population of the service/contributing area is shown in the table below.

Table 3-1: Ward wise Population

Name of Municipality /VDC	Total Area (ha)	Census Population					
		2001	2011	2021	Population Density in 2021	Growth Rate (2001-2011) %	Growth Rate (2011-2021) %
Gokarneswor Municipality							
Ward 1 (partly)	3708	2,499	5,177	7,294	2	7.6	3.5
Ward 2 (partly)	488	5,228	4,632	6,526	13	-1.2	3.5
Ward 4 (partly)	469	4,464	7,508	10,574	23	5.3	3.5
Total	**4665**	**12,191**	**17,317**	**24,394**	**5**	**3.6**	**3.5**

Source: (Gokarneshwor Municipality Profile https://www.nepalarchives.com/content/gokarneshwor-municipality-kathmandu-profile/)

❖ Social Classification

Ward wise social classification is presented based on overall Gokarneshwor Municipality data of 2011 census conducted by Central Bureau of Statistics. The caste composition of project beneficiaries is heterogeneous type. The table below shows that 29.70 % population of service area are Tamang, who belongs to indigenous community and about 12.15 % from Newar community (advanced IP), and 17.62 % are Brahmin, 14.79 are Chhetri and others similarly 1.97 % are Kamis.

Table 3-2: Caste and Ethnicity

S.N	Caste	Population	Percentage
1.	Tamang	31885	29.70
2.	Brahmin	18913	17.62
3.	Chhetri	15,878	14.79
4.	Newar	13048	12.15
5.	Sherpa	4689	4.37
6.	Rai	4456	4.15
7.	Magar	4068	3.79
8.	Kami	2113	1.97
9.	Gurung	1574	1.47
10.	Hyolmo	1086	1.01
11.	Other	9641	8.98

Source: Gokarneshwor Municipality Profile
https://www.nepalarchives.com/content/gokarneshwor-municipality-kathmandu-profile/)

❖ Literacy Status

Literacy status is presented based on overall Gokarneshwor Municipality data. The literacy rate of Gokarneshwor Municipality is 81%. The number of male literacy is higher (44%) comparative to female (37%). The table below shows the details of literacy status of Gokarneshwor Municipality.

Table 3-3: Literacy Rate (5 years and above)

Sex	Can read and write	Can read only	Cannot read and write	Literacy not stated	Total
Male	42,887	1,130	5,250	38	49,305
Female	35,300	1,402	12,999	68	49,769
Total	78,187	2,532	18,349	106	99,174
Percentage (%)	78.92	2.56	18.52	0.11	100

(Source: Gokarneshwor Municipality Profile,2011 Census)
https://www.nepalarchives.com/content/gokarneshwor-municipality-kathmandu-profile/

❖ Occupation

Field interaction with ward chairman, members and other locals about main occupation and major sources of income of the households of project area was done. In the discussion, it is found that they depend on multiple sources of income among which agriculture services and business are the main sources of income.

❖ Land Use Pattern

As per the interaction with ward chairman and the local people during consultation meetings, it was found that most part of land (near about 30%) have been used for agriculture farming. Due to rapid urbanization, agricultural land has been decreasing day by day for residential purpose.

❖ Water Supply

Different sources are used for the purpose of drinking water in proposed project area of Gokarneshwor municipality. The main source of drinking water is water supply from Kathmandu Upatyaka Khanepani Limited (KUKL). Different source of drinking water is presented below.

Table 3-4: Source of Drinking Water

S.N	Name of source	HHs	Percentage (%) HHs
1.	Taped / Piped Water	15960	59.50
2.	Tube well/Handpumps	6076	22.65
3.	Covered Well /Springs	2622	9.78
4.	Spout	1094	4.07
5.	Uncovered Well	367	1.37
6.	River Stream	128	0.48
7.	Other	576	2.15
Total		**22784**	**100**

(Source: Gokarneshwor Municipality Profile)

https://www.nepalarchives.com/content/gokarneshwor-municipality-kathmandu-profile

The major source of drinking water is tap/piped water. More than 60% households have piped system and about 23% HHs depends on tube wells/hand pumps. Few people (about 10%) use water from wells and springs. People in the municipality rarely use stream and river water for drinking purpose. These areas are very near to Sundarijal water treatment plant and the Melamchi pipes are also passing through these communities. Therefore, people here have been benefitted with the good supply of water.

❖ Health and Sanitation

In ward where, the proposed project is located, the health care facilities and sanitation services are provided. Health centre such as Gokarna Primary Hospital at a distance of about 400 m from the alignment of sewer network; and Gokarna Dental Clinic at a distance of about 250 m from the alignment of sewer network is situated in the same ward. Gokarneswor Municipality has been declared Open Defecation Free (ODF) area in 2017. About 84.8% HHs in the municipality have flush toilets with septic tank system and only about 12.8% HHs have ordinary toilets. The different type of toilets uses in the municipality is presented in the table below.

Table 3-5: Toilet Use

S.N	Toilet Use	HHs	HH Percent (%) in 2011
1.	Flush toilets (Septic tank system)	22975	84.8%
2.	Ordinary toilets	3465	12.8%
3.	No toilets	368	1.4%
4.	Not Identified	298	1.1%
Total		**27,106**	**100%**

(Source: CBS, Population Census 2011)

❖ Sewerage System

Municipality, KUKL and DoR have constructed Hume pipe network system. In Gokarna, Nayapati and Baluwa, only some places along the major roads have sewer networks. Sewers are constructed to transport to the DEWATS. Surface runoff is either drained by the side channels/trences on the roads or carried to nearby fields for cultivation purpose. About 77 Km sewers have been recorded in the profile of Gokarneswor Municipality. HPICDBC has constructed sewer on the both side of Bagmati River from Gokarna to Baudha Border. RCC sewers flowing towards Gokarna sewer from community near Gokarneswor temple, HDPE pipes flowing towards Naidol Dewats from Naidol area, RCC pipes newly constructed in Nyamgel and some sewer from community drained to surface open channels are found in the service area. Along the road Jorpati-Sundarijal, the existing open drains have been replaced recently in 2020 with the new big size pipes. They are constructed on the both side of roads and flows towards Komati in East and Suryamati in West.

Existing small DEWATs are found in Naidol, Gokarna, Dese and Kandol and the process of all is Septic tank + reed bed. Among them, Naidol DEWATS is working well but the existing Gokarna DEWATS is not working properly due to insufficient capacity and improper operation and maintenance. Existing Sewerage systems are given in the table below.

Table 3-6: Sewerage System

Sewer Type	Expansion Area	Length (Km)	Implementation Agency
Hume Pipe	Bouddha Border upto Bagmati Bridge and upto southern door along Sankhu Road	3	KUKL, Municipality and DOR
Hume Pipe	Jorpati Chowk to Gokarna through Attarkhel	2	KUKL, Municipality and DOR
Hume Pipe	Gokarna to Baudha border (Bagmati corridor both side)	7	HPCIDBC
Hume Pipe	Inner roads	65	KUKL, Municipality and DOR
	Total	**77**	

(Source: Technical Section, Gokarneswor Municipality Profile 2018)

❖ Waste Management

Gokarneshwor Municipality has been concerned on managing the waste produced in the municipality. Different kinds of awareness program for the proper management of organic waste at household level are conducted by the municipality or different institutions. It is estimated that the total waste generation in Gokarneshwor municipality is 20 metric ton per day. Total waste consists of 58% of organic waste, 8% of plastic waste, 11% of paper waste, 1% glass, 17% metal, and 5% of leather and rubber waste *(Source: Gokarneshwor Municipality Profile (CBS, 2011)*.

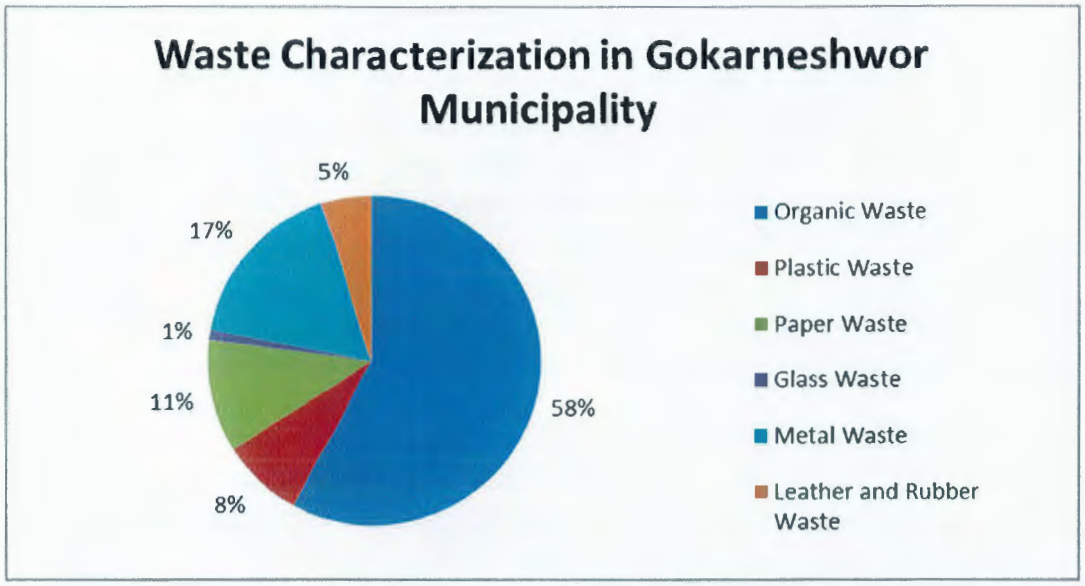

Figure 3-2: Characteristics of general waste generated in Gokarneshwor Municipality

❖ **Existing Other Utilies**

The water supply pipes of different sizes has been found on the roads and especially bigger sizes on the main road of Jorpati – Sundarijal road as we cross the Gokaneswor Mahadev temple until the Syalmati stream. Melamchi pipes of 800 mm dia DI pipes have been laid along the Suryamati Khola in Maiti Nepal area. In addition, there are number of electric pole along the project alignment. Community assets such as electricity poles, telephone lines, cables etc. are aligned along the electric line in the roads.

❖ **Service/Facilities**

The location of the project site is a core area and the area has different facilities of schools such as Sahayogi Secondary school, Smart kids preschool; Health centre such as Gokarna Primary Hospital and Gokarna Dental Clinic; driving center such as Three star driving center, and business activities center such as restaurants, sajib marble and granite house. Different types of shops such as clothes, shoes, kitchen items, etc also exist in the area.

❖ **Cultural Activities**

Gokarneshwor temple and Uttar Gaya are famous shrines in Kathmandu that is located on the bank of Bagmati river. Peoples of Gokarna celebrate many feasts and festivals throughout the year such as Shivaratri, Janai Purnima, Teej and other Nepali festival etc. One of the mandatory rituals for every Hindu, as per Vedic texts and scriptures is the Pind Daan and Gokarneshwor temple and Uttar Gaya are important shrines for performing the ritual. Other temples such as Balbhakteshwor Mahadev, Gadhadhar Narayan Mandir, Ganesh Mandir etc. exists in the area. Uttar Gaya Gokarneswar Kantibhairab Mandir that is 100 m beneath the project area on the banks of the Bagmati river. Different shrines and temples are located in the Gokarna area but not so close to the project site and proposed area don't comprise any cultural heritage site.

C. Procedure Adopted While Preparing the Report

This BES report is prepared in accordance with the legal requirements of GoN, following the procedures outlined in the approved ToR. Necessary information was collected through literature review and field study. Secondary information was collected through published reports and interpretation of maps and photographs. Primary information was collected through measurement, checklist/questionnaire, and consultation with local people/stakeholders and officials. Furthermore, local people were consulted to solicit information through the Public Hearing and Focus Group Discussions (FGD) in the project areas.

❖ Literature Review

The reports and documents relevant to the project were reviewed to the extent possible. Literatures available in the form of records, documents, and maps (land use maps, satellite/Google imagery, land system maps, location maps) etc. of the project area about physical, biological, chemical, socio-economic and cultural environments were collected and reviewed. Due diligence report and Detail design report were the key documents collected and reviewed to determine the nature and scope of activities of the project that influences the environmental conditions of the project area. The source of information were: Municipality/Ward profile of project area published by the Municipalities/Wards; National Population and Housing Census 2011 A.D, published by Central Bureau of Statistics, GoN, other line agencies, related NGOs and other project office in the district. Likewise data on climate, rainfall and other meteorological conditions were also collected from Department of Hydrology and Meteorology (DHM). Sectoral and cross-sectoral environmental Plans, Policies, Acts, Rules, Regulations, Guidelines & Standards were also reviewed. Similarly, reviews of environmental reports of similar projects were done.

❖ Public Notice

Public Notice for Public Hearing; In case of conducting public hearing program at Gokarna, public notice including the place, date and time of hearing was published in Himalaya Times, a national daily newspaper on 2078/09/19 B.S (3 January 2022 A.D) to inform and invite the people in the program. A copy of the public notice was affixed at the ward no-4 office; different institution including school and hospital and other public places from where people have easy access of information. The public notice for public hearing is attached in Appendix-III. The necessary Deed of Enquiry (Muchulka) was collected confirming the pasting of such notice. Deed of Enquiry (Muchulka) is attached in Appendix-IV.

Public Notice for Report Preparation; During the preparation of the environmental report, according to Rule 7 of EPR, a public notice of 7 days was published in Himalaya Times, a national daily newspaper on 2078/10/24 B.S (7 February 2022 A.D) to collect feedback and suggestion of local people and other stakeholders and it e was also published in the project website. The notice was published in the format as indicated in Schedule-9. The notice consists of the statement regarding brief project

information and detail address of the proponent to provide feedbacks and suggestion within 7 days to PID as project proponent. It was affixed at Gokarna ward no-4 office, Gokarneshwor municipality office, different institution including school, hospital, finance and other public places from where people have easy access of information. The necessary Deed of Enquiry (*Muchulka*) was also collected confirming the pasting of such notice. The public notice of Gokarna sites is attached in Appendix-VI and Deed of Enquiry (*Muchulka*) is attached in Appendix-VII.

❖ **Field Study**

Field studies were carried out for the collection of baseline information on physical, biological, socio-economic and cultural environment of the project area. The field studies were conducted by a multi-disciplinary team of experts which includes environment expert, civil engineer, environment engineer and sociologists. Field study comprised of walkthrough survey, consultation with community, focus group discussions with local people and business owners, site inspection and observation. Field visit and walk-through survey was conducted on 2078/07/10; 2078/10/24 and 2078/11/06 to collect existing information. Checklist for focus group discussion and data collection on physical, biological, socio-economic and cultural environment of the project area were developed. Necessary photographs were also taken to show different environmental features of the project site. The district level offices were consulted and publications were collected from them too. Interaction and discussion was held in the proposed project area along the boundary of project area to collect views of the locals. In order to crosscheck the local information, local officials, particularly from the wards of affected municipality were contacted to solicit site specific information. During field visits to all proposed sites, potential impacts and mitigation measures were assessed and discussed with stakeholders. The consultations helped in identifying the felt needs/concerns and priorities of the stakeholders.

❖ **Data Collection**

Data required for the environmental assessment for the proposal were collected. The detailed of data collected for the physical, biological, socio-economic and cultural environmental parameters are given below.

Physical Environment

Data related to physical environment were collected from primary and secondary sources. Data related to hydrology and meteorology was collected from Department of Hydrology and Meteorology (DHM). Air quality data were collected from the website of Ministry of Forests and Environment (Air Quality Monitoring). Data for the rate analysis were collected from District Rate – F.Y 2078/079 of Kathmandu District for the sewer network. Land use maps, satellite/Google imagery, land system maps and location maps were studied in detail to collect the necessary information about the land use patterns and other features along the project area. Noise level monitoring data was collected using the noise meter.

Biological Environment

Information on the flora and fauna, protected, rare and endangered species, sensitive habitats, etc. of the proposed area were collected through available records, walkthrough survey and consultation with local people and through published papers (*Mehta, K. R., & Kushwaha, U. K. S., 2016)*. However, no any, rare and endangered species, sensitive habitats existed within the project area.

Socio-economic and Cultural Environment

Socio-economic and cultural environment data, such as population of project district, households' size, male-female ratio, infrastructures, ethnic composition, religion, employment facilities and education, etc. were derived from Population and Housing Census, Central Bureau of Statistics, GoN/ Nepal, 2011, Demographic Profile of Nepal 2013/14 and Ward Profiles/ Municipality profiles of project affected area. Field visit and walk-through survey was conducted on 2078/07/10; 2078/10/24 and 2078/11/06 to collect existing information. Checklists for data collection socio-economic and cultural environment of the project area were developed. Existing market status, service/facilities, other utilizes (water supply, sewerage systems, electrical poles, telephone lines, cables, etc.), cultural activities and other infrastructures were also collected during field study. Municipality officials were also contacted to verify the socio-economic information. Google maps were also used to measure the distance of the project area from the nearby temples.

❖ **Public Consultations and Public Hearing**

While conducting the environmental study, public consultations and public hearings were done to interact with the local people for their feedback to ensure the effectiveness of the study. As part of the feasibility studies, an extensive consultation program with key stakeholders was carried out. The tools used for consultations were stakeholder meetings, public hearings, interviews, structured questionnaires, and focus group discussions (FGD). Key concerns of the people related to the project and inclusion of poor in the waste water, relation of waste water and health and hygiene issues, people's participation in project implementation and role of key stakeholders were discussed. The minutes of the meetings and the opinion/suggestion received is attached in Appendix IX. Minutes of public consultation is presented in the Appendix IX.

Public Hearing; According to Rule 6 of EPR 2077, public hearing program was organized on Gokarneshwor municipality ward no-4 office for Sewer Network Development in Gokarneshwor Municipality on 2078/09/26 B.S (10 January 2022 A.D) for the collection of feedback and suggestion of the people. The minute with the comments received is attached in Appendix-V.

The summary of consultations and discussions held with stakeholders at project affected ward offices of Gokarneshwor municipality and the opinion/suggestions received from the public are listed in the tables below.

Table 3-7: Summary of Consultations

Date	Location	No. of Participants			Topics Discussed
		Total	Male	Female	
2077/12/19 B.S (1 April 2021)	Ward no 4 office of Gokarneshwor Municipality	80	54	26	Technical, social and Environmental aspect of project Coordination with Municipality
2078/09/26 B.S (10 January 2022)	Ward no 4 office of Gokarneshwor Municipality	32	17	15	Technical, social and Environmental aspect of project
2078/10/24 B.S (7 February 2022 A.D)	Focus Group Discussion (Shopkeeper's group) Ward no 4 of Gokarneshwor Municipality	7	5	2	Social and Environmental aspect of project
2078/11/06 B.S (18 March 2022 A.D)	Focus Group Discussion (Women's group) Ward no 4 of Gokarneshwor Municipality	8	0	8	Social and Environmental aspect of project

Table 3-8: Opinion/Suggestions

Name	Opinion/Suggestions
Jagdish Chandra Bhat Gokarneshwor Municipality Ward no 4	The discharged water should be taken from the ground to the bottom of the canal in front of the Ganesh temple. After the construction of DEWATS, the management should be strong so that the systematic operation can last for a long time. While carrying out the work of the project, the work inspection committee should be prepared by the local citizens.
Bidur Kumar Thapa Gokarneshwor Municipality Ward no 4	Treated water should be discharged downstream by making underground pipes in the river. The foul smell should not exist.
Komal Bhahadur Bista	Since it cannot be operated only from internal sources, the DEWATS plant should be guaranteed for a long

	time. Please take the treated water via underground and discharge it beneath to the old canal.
Bisnu Sunam	The sewer pipe has been laid twice. But the storm water from the road line and everything else is mixed with water. So now that pipe size is not enough. Earlier, septic tank was present in each household but as the road was extended people do not have land to make the septic tank. Hence they directly discharge the sewer line.
Bidur Kumar Thapa	Whether you need private land or not? You have to work before for approval to work in the private land. The river is getting very dirty due to sand washing in Kolmati. Please think if anything could be done about that?
Shiba prashad Sharma Gokarneshwor Municipality Ward no 4	Please manage to construct a sewerage network on the bank of Chandramati river flowing from the side of Gokarna temple, and take the sewer line to the DEWATS for its treatment.

The comments have been addressed by adding around 430 m of pipe from the DEWATS area. The effluent from DEWATS will finally be disposed 150 m downstream of the Gokarneshwor temple.

❖ **Recommendation Letters**

Comments & suggestions from the concerned stakeholders and affected peoples were also collected. Finally, Letter of recommendation for the implementation of the project was collected from concerned ward office. The feedbacks/suggestions are addressed in this BES report. Copy of recommendation letters are given in Appendix-VIII.

❖ **Data Processing**

Primary and secondary data were processed through excel spread sheet. Available maps were interpreted. Physical, Biological information is tabulated to the extent possible. Socio-economic and cultural information is cross-checked and analysed. Socio-economic information is processed using computer- spread sheet, tabulated and presented in the text as appropriate. All the feedbacks and suggestions from the people and concerned stakeholders were reviewed and addressed during preparation of the report.

❖ **Report Preparation**

Environmental impacts have been identified through a review of project components, site visit and discussion with engineers in the design team, resource persons and stakeholders. The BES report was prepared in the format as indicated in Schedule-10, of EPR, 2077. This BES report is based on preliminary design. Both beneficial and adverse environment has been assessed during the preparation of BES report.

D. Beneficial Impacts of the Implementation of the Proposal on the Environment

The likely beneficial environmental impacts on the physical, biological, and socio-economic and cultural environments envisaged during construction, and operation /maintenance phases are discussed here in detail and further enhancement measures are suggested.

- **Employment generation;**

Employment opportunity will be generated during the time of construction there will be involvement of people in different construction works and about 40 skilled and unskilled manpower per day for jobs such as mason, carpenter, concreter, bar bender, rock chiseller, plumber, security guard, etc. will be required. ,

- **Local level entrepreneurship development;**

During construction phase local business sector will gain a momentum. Different types of commercial activities are likely to increase such as small shops and restaurants around the vicinity of the project area will get more customers. The demand of local food items (rice, pulses, vegetables etc.) will increase. As a result, local level entrepreneurship is developed within the project area. .

- **Skills enhancement;**

Construction of project is likely to enhance the skill of different works such as masonry, concrete related, form, gabion, pipes, river training and slope protection of workers. The skill and knowledge acquired form the sewer project can be utilized in similar project in future to earn livelihoods. Skill and knowledge transfer will be a plus point in any other relevant works. While working together with the skilled manpower, other unskilled manpower will also get chance to learn and enhance their skill.

- **Enhancement of existing sewer network within the core area;**

After project implementation, there will be improvement in sewer network in the area and all the sewage will be transported to the wastewater treatment plant.

- **Clean environment;**

A clean environment will be created in Gokarna area by collecting the sewage water and transporting it to the wastewater treatment plant. This positively affects the health and living standard of the people in that place.

- **Improvement of water quality in the river/streams;**

Water quality of Bagmati river, Kolamati river and Suryamati river in Gokarna area is degrading day by day due to direct disposal of household sewer on river banks. The water quality of river / stream will be improved significantly as the sewer line will be taken to the DEWATS at Gokarna for treatment. .

- **Ecological preservation of river;**

No significant aquatic life in the present days can be identified in Bagmati river especially during dry season when there is no flow of river water and major flow

comprise sewage directly disposed from sewer network. Collection of sewage using sewer line and preventing the on-going direct discharge of the sewer in river will preserve river ecology and will help to revive river ecosystem.

E. Adverse Impacts of the Implementation of the Proposal on the Environment

The project activities during construction and in subsequent operation and maintenance stages may create a number of adverse impacts on environment due to the interaction between project actions and local environment. The likely adverse impacts during construction and subsequent operation and maintenance stages in terms of Physical, Biological, Socio-economic and Cultural environment due to the project actions, as stated in the following sections, will be identified, predicted and evaluated. Adverse impacts will be considered in three major phases:

❖ **Pre- Construction Phase**

One of the most important activities before construction is the identification of the likely adverse impacts and their mitigation measures before construction works commence. Some impacts that are likely to occur during the pre-construction phase are listed below:

- **Social conflict/obstruction;**

During preparation of the project site social conflict may raise resulting in the delay of works..

- **Disturbance to the surrounding environment;**

Disturbance to the surrounding environment may occur while surveying and establishment of labour camp. Haphazard construction of camps for workers without basic amenities could result in social stress and the degradation of the local environment. .

❖ **Construction Phase**

Physical Environment

- **Soil erosion and slope instability;**

Soil erosion and slope instability may be caused by earthwork excavation and exposed earthwork, although no major slopes are identified in the project area.

- **Air pollution;**

Air pollution will arise due to activities like site clearance, excavation for laying of pipeline, concreting/construction of sewer appurtenances, operation of construction machines and equipment's for different activities like excavation of earthwork, drilling, construction materials stocking piling and plying of different vehicles at the construction sites and rehabilitation/restoration. These all activities will generate different gaseous and dust particles (PM10, TSP and others).

- **Water pollution;**

Water pollution could occur due to runoff from construction activities. Moreover,

during the construction period water logging on the trench excavated can pollute the surface and ground water.

- **Land pollution;**

Land pollution could occur by improper storage and handling of all materials like construction aggregates, toxic, non-toxic and hazardous.

- **Noise pollution, and vibrations;**

Operation of construction machine and equipment for different activities like excavation of earthwork, drilling and plying of vehicles will generate noise and vibrations. These will be significant adverse impact to the ambient environment. .

- **Generation of waste (construction activities/operation of camp);**

Waste will be generated due to construction activities and labour camp operation, etc.

Biological Environment

- **Impact on flora**

All the pipe line will be laid either along the existing road or along the bank of river on the public land. There are few small trees along the Suryamati river bank. As per the design trees will not be affected during the construction. So, clearance of tree and vegetation is not required.

- **Impact on aquatic life**

The construction activities may indirectly disturb the water quality and may cause adverse impact on aquatic life.

Socio - Economic and Cultural Environment

- **Traffic congestion;**

Construction activities like open trenches, excavation across roads, or road closures and massive storage and stockpiling of construction material & pipe at site etc. will create traffic congestion and this will ultimately affect the daily activities of the local. .

- **Damage to existing physical infrastructures and community services;**

Construction activities like excavation and compaction could have adverse impacts on community services and infrastructure such as electricity poles, telephone lines, drinking water pipes, sewerage lines and roads surface.

- **Disturbance to the surrounding environment;**

Due to operation of labor camp there will be disturbance to the surrounding environment.

- **Increase in crime and community stress;**

There will be an influx of outside workers to the project site with their immediate family members. This can increase crime and social stress, create unwanted congestion,

and exert pressure on the limited local resources. Alcohol abuse, gambling, and other social disharmony are likely to occur in the labour camp and construction site.

- **Impact on safety, health and hygiene of workers;**

There could be adverse impacts on the health and hygiene of the workers due to OHS hazards like unsafe working conditions, accidents, fire hazards, transmission of communicable diseases etc.

- **Impact on health and safety of community;**

There could be adverse impacts on the health and safety of community due to the construction activities like excavation, stockpiling of pipes along roadside, compaction and restoration etc. These construction actives may cause traffic accidents, hazard to people and children playing in the surrounding area.

- **Outbreak of any Pandemic disease and Vector diseases;**

Outbreak of the pandemic disease such as COVID-19 and vector diseases may impact on health and hygiene of workers, the surrounding communities and all other people related with the project. .

❖ **Operation and Maintenance Phase**

- **Health and safety of cleaning staff at risk;;**

Health and safety of sewer cleaning staff will be at risk of communicable diseases and confined space works during cleaning and maintenance of systems. .

- **Impact on health and safety of community;**

Health and safety of community will be at risk during operation and maintenance of systems. There will be possibility of open manhole which will cause accidents to bikes, pedestrians and children's and hazard to people. During the summer season odor nuisance problems will arise. .

F. Environmental Management Plan and Institutional Requirements

❖ Environmental Management Plan

Environmental Management Plan is an important part of environment assessment report. It is tool for identifying and quantifying the impacts to formulate strategies in order to minimize adverse impacts and maximize the beneficial impacts caused by the implementation of the project.

The Objectives of the EMP;

a) to ensure that all mitigation measures and monitoring requirements will actually be carried out at different stages of project implementation and operation - preconstruction, construction and operation and maintenance;
b) recommend a plan of action and a means of testing the plan to meet existing and projected environmental problems;
c) establish the roles and responsibilities of all parties involved in the project's environmental management;
d) describe mitigation measures that will be implemented to avoid or mitigate adverse environmental impacts and maximizing the positive ones;
e) ensure implementation of recommended actions aimed at environmental management and its enhancement; and
f) ensure that the environment and its surrounding areas are protected and developed to meet the needs of the local people and stakeholders.

❖ Implementation of EMP

The Environmental Management Plan (EMP) has been prepared to ensure that all mitigation measures and monitoring requirements will actually be carried out at different stages of project i.e. project design, pre-construction, construction and operation and maintenance. The roles and responsibilities of all parties involved in the project's environmental management have also been established. Mitigation measures will be implemented to avoid or mitigate adverse environmental impacts and maximizing the positive ones; ensuring the environment and its surrounding areas are protected and meet the needs of the local people and stakeholders. Monitoring will evaluate; (i) the extent and severity of the adverse environmental impacts as compared to what was predicted, (ii) how effective the mitigating measures were and compliance with the rules and regulations and (iii) the overall effectiveness of the EMP. It is important that the recommended mitigation measures are carried out according to the spirit of the environmental assessment process and in line with the guidelines of funding agencies. Issues related to environment and social safeguard are covered in different BOQ items and provisional sum.

The Environmental Management Plan (EMP) is presented in the table below. The table lists the environmental area, project activities/issues, environmental impact (beneficial and adverse), enhancement and mitigating measures, cost/action, monitoring and evaluation. The issue raised during the public hearing is also included in EMP.

Table 3-9: Environmental Management Plan (EMP) of Sewer Network Development in Gokarneshwor Municipality

Environmental Area	Project Activities Issues	Beneficial Environmental Impacts	What Activities	Where	How	When	Responsibility	Required Manpower/Cost/ Time	Monitoring/ Evaluation
Socio-economic and Cultural Environment	-Opportunity for various skilled and non-skilled workforce(mason, carpenter, concreter, bar bender, rock chiseller, plumber, security guard, etc)	Employment Generation	- People (above 16 years) skilled and unskilled both will be employed; -Priority to local people particularly underprivileged (poor, ethnic minority and women) will be given; -Wage rate will be settled based on the District Wage Evaluation Committee (DWEC);	Project Site	-Making employment policy -Hiring workers	During Construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Requirements have been included in the General Conditions of Contract(GCC 6)	(KUKL-PID/ Gokarneshwor Municipality-Ward/DSC/ CASSC)
Socio-economic and Cultural Environment	- Local business sector will gain a momentum	Local level entrepreneurship development	-Priority will be given to local business sectors such as some small shops and restaurants;	Surrounding area	Buying products from local shops	During Construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Contractor's Responsibility	(KUKL-PID/ Gokarneshwor Municipality-Ward/ DSC/ CASSC)
Socio-economic and Cultural Environment	-Skill and knowledge transfer will be a plus point in any other relevant works	Skill Enhancement	-Skill and technical knowledge will be transferred to the human resources involved in the project;	Project Site	Hiring workers	During Construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Contractor's Responsibility	(KUKL-PID/ Gokarneshwor Municipality-Wards/ DSC/ CASSC)

Environmental Area	Project Activities /Issues	Adverse Environmental Impacts	What Activities	Where	How	When	Responsibility	Required/ Manpower/Cost/ Time	Monitoring/ Evaluation
Pre-Construction Phase									
Socio-economic and Cultural Environment	Preparation of Project Site	Social conflict/ Obstruction	-A communications plan will be developed by the contractor and implemented to make the stakeholders feel they are part of the project and it belongs to them; -Applications will be submitted to get approval; -Affected communities will be consulted and due notifications will be given for possible interruptions due to construction;	Project Site	Communication Plan	During Pre-construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Contractor's Responsibility	(KUKL-PID/ Gokarneshwor Municipality-Ward/ DSC/ CASSC)
Socio-economic and Cultural Environment	Surveying and Establishment of Labor Camp	Disturbance to surrounding environment	-Established of labor camp will be done within designated area; -No camp facilities will be located in any areas considered at risk of flooding or natural hazards; -The labour camp will be constructed following the Labour Camp Standard of PID; -The labor camp should be surrounded by durable permanent fencing material to prevent unauthorized public access;	Project Site Labour camp	locating a specific site	During Pre-construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Contractor's Responsibility	(KUKL-PID/ Gokarneshwor Municipality-Ward/ DSC/ CASSC)

Environmental Area	Project Activities /Issues	Beneficial Environmental Impacts	What Activities	Where	How	When	Responsibility	Required/ Manpower/Cost/ Time	Monitoring/ Evaluation
			-Labor camps will be provided with sanitary amenities and separate toilet for male & female will be constructed;						
Construction Phase									
Physical Environment	Earthwork excavation and exposed earthwork	Soil erosion and Slope instability	-Excavated earth will be disposed at designated sites with proper and stabilization and turfing/vegetation; -Controlled stockpiling of the excavated earth and protection from runoff erosion, and blowing by wind will be done; -Topsoil will be kept separately from other excavated earth. Reuse of excavated earth in the final landscaping of the area will be done. The excavated areas' backfill will be compacted and include lay replacement of topsoil over that for vegetation; -Mulching will be done to stabilize exposed areas and prevent from erosion; - During the rainy season work will be avoided as much as possible; -Shoring will be applied while	Project Site	-Design ate disposal site - Transport excavated earthwork to the disposal site	During Construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Provisioned in BOQ	KUKL-PID/ DSC/ CASSC

Environmental Area	Project Activities /Issues	Beneficial Environmental Impacts	What Activities	Where	How	When	Responsibility	Required/ Manpower/Cost/ Time	Monitoring/ Evaluation
			excavating trench more than 1.5 m; -Any soil humps of the excavated material will not be remained at the construction site after the compaction;						
Physical Environment	Site clearance, excavation for laying of pipeline, concreting/construction of sewer appurtenances, operation of construction machines and equipment's for different activities like excavation of earthwork, drilling, construction materials stocking piling and plying of different vehicles at the construction sites and rehabilitation/restoration	Air pollution	-All the dismantled materials and excavated spoil will be removed completely from the construction area and will be disposed on identified spoil disposal site; -Loose stockpiles will be stabilize and covered using tarpaulins; - No excavated materials will be piled along the road; - Clean up of the area before closure of work will be done; - Dust suppression at open sites will be done by sprinkling water 3-4 times in a day as required; - Immediate rehabilitation of project area will be done and reinstated to its previous conditions (i.e. to the standard as before and / or better); - Proper sealing of the road surface will be done.	Project Site	-Segregate waste - Transport spoil to the disposal site	During Construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Contractor's Responsibility	KUKL-PID/ DSC/ CASSC

Environmental Area	Project Activities /Issues	Beneficial Environmental Impacts	What Activities	Where	How	When	Responsibility	Required/ Manpower/Cost/ Time	Monitoring/ Evaluation
			Compaction to specified international standard (backfill shall be compacted to a dry density of not less than 90% of the maximum dry density); -Littering of construction material while transportation will be prohibited; -Tarpaulins will be used to cover sand and other loose materials during transport; -Vehicle speed to 10-15 km/hr will be limited; site will be signed specifying speed limits; -Ambient air quality monitoring at strategic locations will be conducted once before construction and second during construction phase ensuring that sampling locations are based on the wind and dust/smoke dispersion direction at the site.						
Physical Environment	Runoff from construction areas and water logging on the trench	Water pollution (surface / under-ground)	-Where Water is likely to create unstable soil conditions, a well point system erected on both sides of the trench will be employed to drain the immediate area of the trench prior to excavation operation;	Project Site	-Make Drain -Make catch pits	During Construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Contractor's Responsibility	KUKL-PID/ DSC/ CASSC

			-Catchment basins or drainage will be constructed around the stockpiling area; to prevent the undesirable accumulation of water in or around spoil dumps; -Cement slurry will not be thrown directly on surrounding area (temporary pit will be constructed to collect the cement slurry); -Channels and ditches for post-construction flow will be provided; -No excavated materials will be piled along the Bagmati, Kolamati and Suryamati river bank at Gokarna;						
Physical Environment	Improper storage and handling of all materials like construction aggregates, toxic, non-toxic and hazardous materials	Land pollution	-Proper storage of all materials will be done in safe place /warehouse; -Materials will be stored safely by barricading /fencing the area; -Segregating and disposing of chemical containers, packaging materials, plastic bags, etc. -All the toxic materials including batteries, oil filters, mobil etc. will be collected separately in a	Project Site / Storage Area	- Proper Storage -Training	During Construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Contractor's Responsibility	KUKL-PID/ DSC/ CASSC

Environmental Area	Project Activities/ Issues	Beneficial Environmental Impacts	What/ Activities	Where	How	When	Responsibility	Required/ Manpower/Cost/ Time	Monitoring/ Evaluation
			bounded area in separate containers; -Used oil and lubricants will be recovered and reused or removed from the sites; -All fuel use areas e.g. generator will have drip basins installed to prevent any leakages and recycled; -All fuelling, repairing and maintenance work will be done on a concrete surface provided with a catch tank that can be cleaned and all spilled fuel recovered and recycled; -Training will be provided to workers on safe handling of toxic materials;						
Physical Environment	Operation of construction machineries and equipment for different activities like excavation of earthwork, drilling and plying of vehicles	Noise pollution and Vibration	-Correct manual handling technique and mechanical aids will be used; -Operations of construction machineries / equipment's and vehicles will be carried by licensed personnel; -Mufflers will be fitted in all equipment which generate noise to confine noise levels;	Project Site	-Noise measuring equipment	During Construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Provisioned in BOQ	KUKL-PID/ DSC/ CASSC

Environmental Area	Project Activities /Issues	Beneficial Environmental Impacts	What Activities	Where	How	When	Responsibility	Required/ Manpower/Cost/ Time	Monitoring/ Evaluation
			-Ear plugs will be provided to the workers while working with heavy noise equipment; -Vehicle speed to 10-15 km/hr will be limited; site will be signed specifying speed limits; -Construction vehicles will be used complying with the National Vehicle Mass Emission Standards, 2069 B.S; -Noise levels will be regularly monitor at site to meet the noise standards;						
Physical Environment	Construction activities/Operation of labor camp	Generation of waste	-The surplus excavated / construction materials will be disposed off at designated and stabilized sites set after coordination with representative from relevant ward and municipality in an environmental friendly manner; -Clean up of the area before closure of work will be done and no debris and refuse will be left at site; - The camp will be kept in a neat and orderly fashion, with proper disposal of waste, based on 3R's approach (reduce, reuse and	Project Site/Labor Camp	Transport spoil to the disposal site	During Construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Contractor's Responsibility	KUKL-PID/ DSC/ CASSC

Environmental Area	Project Activities Issues	Beneficial Environmental Impacts	What Activities	Where	How	When	Responsibility	Required/ Manpower/Cost/ Time	Monitoring/ Evaluation
			recycle); - The waste generated from the camp will be disposed in municipality truck in coordination with the municipality.						
Biological Environment	Excavation	Impact on flora	-The tree felling will be avoided, and if any such case occur, prior approval from the local bodies will be received and compensatory plantation @ 1:10 will be carried out on any potential location or the river banks; -Tree plantation plan will be made by the contractor prior to the tree cutting activity;	Project Site	Tree plantation plan	During construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Provisioned in BOQ	KUKL-PID/ DSC/ CASSC
Biological Environment	Discharge of liquid wastes, solid wastes and toxic chemicals such as oils, mobiles; Waste generated from labor camp	Impact on aquatic life	-Discharge of liquid wastes, solid wastes and toxic chemicals such as oils, mobiles and etc. in the nearby river or streams will be prohibited; -Storage areas for fuels and lubricants will be away from any drainage leading to water bodies; -No excavated materials will be piled along the Bagmati, Kolamati and Suryamati river	Project Site, River	Proper storage	During construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Contractors's responsibility	KUKL-PID/ DSC/ CASSC

Environmental Area	Project Activities /Issues	Beneficial Environmental Impacts	What Activities	Where	How	When	Responsibility	Required/ Manpower/Cost/ Time	Monitoring/ Evaluation
			bank at Gokarna; -The waste generated from the camp will be disposed in municipality truck in coordination with the municipality;						
Socio-economic and Cultural Environment	Construction activities like open trenches, excavation across roads, or road closures and massive storage /stockpiling of construction materials etc.	Traffic congestion	-Traffic management plan will be developed to minimize traffic flow interference from construction activities and in place prior to the excavation; - The local area people and traffic management office will be consulted and will be informed on the construction scheduling and possible obstruction in the vehicular traffic in the specified site; - Signage such "work to commence" and "work in progress" will be erected; - Alternative route signage in Nepali and English languages will be erected; --Onsite "grievance handling" through the use of liaison officers will be arranged; -Construction materials will be brought into construction areas	Project Site	Traffic Management Plan, Make storage area	During Construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Provisioned in BOQ	KUKL-PID/ DSC/ CASSC

Environmental Area	Project Activities/ Issues	Beneficial Environmental Impacts	What Activities	Where	How	When	Responsibility	Required Manpower/Cost/ Time	Monitoring/ Evaluation
			as and when required day before construction; -No any stockpiling of construction material will be done adjacent to the area on private land;						
Socio-economic and Cultural Environment	Construction activities like excavation and compaction	Damage to community services and existing infrastructures	-Reinstatement of (such as electricity poles, telephone lines, drinking water pipes, sewerage lines and road surface) will be done to its previous conditions; (i.e. to the standard as before and / or better);	Project Site/ Storage area	Rehabilitation	During Construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Provisioned in BOQ	KUKL-PID/ DSC/ CASSC
Socio-economic and Cultural Environment	Operation of Labor Camp	Disturbance to the surrounding environment	-Operation of camp will be maintained as per Labor Camp Standard of PID; -Access to adequate water for all workers will be given; -Safe toilets and septic tanks will be provided in site; - The camp will be kept in a neat and orderly fashion, with proper disposal of waste, based on 3R's approach (reduce, reuse and recycle); -Coordination with municipality for the management of solid waste generated from camp and	Camp Site	Regular cleaning Waste management	During Construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Contractor's Responsibility	KUKL-PID/ DSC/ CASSC

Environmental Area	Project Activities /Issues	Beneficial Environmental Impacts	What Activities	Where	How	When	Responsibility	Required/ Manpower/Cost/ Time	Monitoring/ Evaluation
			its disposal will be done; -Open burning of solid waste will be prohibited; -PID OHS Manual will be strictly followed.						
Socio-economic and Cultural Environment	Influx of outside workers	Increase in crime and community stress	-Special instruction to all the workers to acts in a responsible manner during and after the working hours, respecting the rights, property and practices of local people will be given; -Gambling and alcohol consumption in camp sites will be prohibited ; -The workers will be instructed to respect the local cultures, traditions, etc;	Project Site	Awareness Program	During Construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Contractor's Responsibility	KUKL-PID/ DSC/ CASSC
Socio-economic and Cultural Environment	OHS Hazards (unsafe working conditions, accidents, fire hazards, transmission of communicable diseases etc.)	Impact on safety, health and hygiene of workers	-Training in occupational health and safety (OHS) for all site personnel will be given; -Orientation to visitors on health and safety procedures at work site will be conducted; -First aid kits and stretcher will be kept in construction sites; -Fire extinguishers and first aid box will be kept at the labor	Project area	-Training -Insurance - Monitoring	During Construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Provisioned in BOQ	KUKL-PID/ DSC/ CASSC

Environmental Area	Project Activities /Issues	Beneficial Environmental Impacts	What Activities	Where	How	When	Responsibility	Required Manpower/Cost/ Time	Monitoring/ Evaluation
			camp and stockyard. -Potable drinking water in the work area will be provided; -Basic sanitary facility for the workers will be provided; -Competent supervision will be provided on-site and and EHS officer to will be on-site ; -Personal Protective Equipment (PPE) to all workers at the construction site throughout the construction activities will be provided; -Regular health check ups, sanitation and hygiene, health care, and control of epidemic diseases to the workers will be done; -Awareness programs will be lunched concerning the possibility of spread of sexually transmitted diseases (STDs) and HIV/AIDS using brochures, posters, and signboards; -Insurance to workers will be provided; -Compensate for the loss of life or any type of injuries (a zero						

Environmental Area	Project Activities /Issues	Beneficial Environmental Impacts	What Activities	Where	How	When	Responsibility	Required Manpower/Cost/ Time	Monitoring/ Evaluation
			tolerance to loss of life policy will be developed and implemented); -Approved Health and Safety Plan will be implemented; - MOU will be done with nearby hospitals in case of emergency - Wastewater pollution on land, humans, receiving waters, and the environment will be avoided and clean- up equipment on site will be maintainted;						
Socio-economic and Cultural Environment	Construction activities like excavation, stockpiling of pipes along roadside, compaction and restoration	Impact on health and safety of community	-Prior notice to local communities about the construction will be given; -Site specific traffic rules and alternative traffic routes with appropriate sign and signage will be made to avoid traffic accidents and traffic jams; -Awareness programme/ meetings with local communities will be conducted regularly; -Emergency plan will be prepared; Application of adequate safety signboards will be done; Warning signs, warning tapes, and notices around the	Project surrounding area	Notice Meeting	During Construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Contractor's Responsibility	KUKL-PID/ DSC/ CASSC

Environmental Area	Project Activities /Issues	Beneficial Environmental Impacts	What Activities	Where	How	When	Responsibility	Required Manpower/Cost/ Time	Monitoring/ Evaluation
			work site will be installed to avoid unauthorized entry; - The Contractor will provide construct/install and maintain site safety, hard barricading, flexible green net, signboards, temporary day/light traffic diversions throughout the construction activities according to the specifications. Signage will be installed to identify all areas at work site, including hazard or danger areas; -Safety barricade will be erected before undertaking designated activities. Barriers are to be engineered to withstand heavy winds and rains and must consider public safety (i.e. no sharp protrusions or edges, no tripping risks, major gaps and holes) and be sturdy enough for the intended purpose; -Open trenches with steel planks will be covered during off-work hours and during work hours. Especially the deep trenches which cannot be covered entirely steel planks with handrails that can be used by pedestrians will						

Environmental Area	Project Activities /Issues	Beneficial Environmental Impacts	What Activities	Where	How	When	Responsibility	Required/ Manpower/Cost/ Time	Monitoring/ Evaluation
			be provided; - The possibility of accidents to the people of the community due to trench excavations will be prevented. -Re-surface without leaving gaps or uneven surfaces will be done and erection of fence around hazardous area will be done until they are safe and restored; - Disturbance will be minimized and trench closure / compaction /restoration will be undertaken as quickly as feasible;						
Socio-economic and Cultural Environment	Pandemic disease such as COVID-19 and Vector diseaes	Outbreak of any Pandemic disease and Vector diseaes	- The OHS plan and SOP will be prepared; - The proposed OHS plan and SOP will be updated as and when new government circular and guidelines are issued; - Waste generated from isolated workers' camp will be stored separately and will be disposed in coordination with the Municipality; - Regular health check ups, sanitation and hygiene, health care, and control of vector	Project site, Site office	Awareness Program, Follow the rules	During Construction	Primary Responsibility-Contractor/ Supporting Role-DSC/ CASSC	Provisioned in BOQ	KUKL-PID/ DSC/ CASSC

Environmental Area	Project Activities /Issues	Beneficial Environmental Impacts	What Activities	Where	How	When	Responsibility	Required/ Manpower/Cost/ Time	Monitoring/ Evaluation
			diseases to the workers will be done; - Record keeping and health screening of workers will be done; - Awareness programs will be lunched concerning the possibility of spread of pandemic and vector diseases using brochures, posters, and signboards; - MOU will be done with nearby hospitals in case of emergency.avoided;						

*{**Note: DSC:** Design and Supervision Consultant, **CSE**: Construction Supervision Engineer (DSC), **CASSC**: Community Awareness and Social Safeguard Consultant, **KVWSMB:** Kathmandu Valley Water Supply Management Board, **KUKL-PID**- Kathmandu Upatyaka Khanepani Limited- Project Implementation Directo **IPC:** Interim Payment Certificate}*

❖ Institutional Arrangement

The Ministry of Forests and Environment, (MoFE) is the main institution mandated to formulate and implement environmental policies, plans and programmes at the national level. 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. Two consulting firms, design, supervision and management consultant (DSC) and community awareness and safeguard support consultant (CASSC). These consulting firms facilitate PID in assessment, implementation and supervision of environmental and social safeguards-related works. The role and responsibilities of institutional/organizational in environmental management are presented in the Table 3-10.

❖ Reporting Procedures

Contractors are to submit monthly SEMP implementation status reports to DSC DSC should submit quarterly reports to PID which should be reviewed by the Safeguard Unit of PID. The report should also include cases of compliance and non-compliance and the corresponding further mitigation measures to be adopted to correct the non-compliances and also include the outcome of the monitoring, important issues identified and the measures to be undertaken to ameliorate them. DSC is responsible for checking the monthly progress reports submitted by the Contractor and field verified whether or not the Contractor has complied with the approved conditions as stated in the SEMP. Monthly progress reports, including bi-annual and annual reports on the implementation of EMP should be produced on a regular basis.

Government of Nepal Ministry of Water Supply Singha durbar, Kathmandu

Project Implementation Directorate Kathmandu Upatyaka Khanepani Limited Estd 2009

DOHWA ENGINEERING CO., LTD. KVWMP NJDSC06 in association with ERMC TAEC

Table 3-10: Institutional/Organizational Responsibilities in Environmental Management

Organization	Roles and Responsibilities		
	Pre- construction Phase	**Construction Phase**	**Operation Phase**
Ministry of Water Supply (MoWS)	•Review and approve IEE reports; •Review design and tender documents in order to examine whether or not mitigation prescriptions are included and instruct KUKL.	Review IEE Report (i) to ensure EMP implementation (ii) effectiveness of the implementation measures and compliance.	•Review bi-annual monitoring reports, and •Annual site inspection.
Kathmandu Valley Water Supply Management Board (KVWSMB) / **Kathmandu Upatyaka Khanepani Limited (KUKL) and Projection Implementation Directorate (PID)**	•Review final design and tender documents and forward them to MoWS, •Establish 'Safeguard Unit/Utility Management Coordination Sub-committee /appoint Design and Supervision Consultant (DSC) •Obtain all necessary permissions and permits, notify, carry out land acquisition (if required), and crop compensation evaluation Select contractor, award and review SEMP document prepared by the contractor and approve it.	Conduct frontline monitoring on mitigation implementation (i) effectiveness (ii) enhancement programs (iii) appoint monitoring team (iv) ensure public participation (vi) environmental compliance and Prepare quality-monitoring report to submit to MoWS.	•Ensure smooth operation of sewerage systems •Regular and timely maintenance
Municipality	Cooperation and coordination in meeting with stakeholders	Monitoring of the EMP implementation /mitigation effectiveness.	Support to KUKL in operation and maintenance.
Project Affected	Cooperation and coordination in	Monitoring of the	Support to KUKL in

Ward	meeting with stakeholders	EMP implementation /mitigation effectiveness.	operation and maintenance.
Design and Supervision Consultant (DSC)	•Incorporate all provisions of EMP in the final design; • Incorporate all mitigation measures in the tender documents; •Assist in site inspection during land intake; •Baseline monitoring of air and receiving water quality, noise level and vibrations and overall environmental status of the project area; •Gather the required environmental baseline data; •Preparation of IEE Report; •Review SEMP document prepared by the contractor.	•Approval of construction works; •Monitoring of the contractor's performance on EMP implementation/ mitigation effectiveness / impact monitoring; Labour employment as per regulations; •Instruct contractor for corrective actions; •Impose fine/or null payment in case of non-compliance; •Prepare monthly monitoring report/ participate in inspection; •Periodic monitoring of air quality, receiving water quality and noise and vibration levels at the project area; •Monitoring of impacts on physical, biological and socio-economic environment in the project area; •Conduct trainings and Community Awareness and periodic meetings with stakeholders and •Submit monthly and bi-annual progress reports, including monitoring results and mitigation activities.	
Construction Contractor	• Shall mobilize at least one environmental health and safety supervisor; •Shall gather the required environmental baseline data; •Submit SEMP for review and	• The contractor shall have at least one environmental health and safety supervisor (or equivalent) responsible for implementing applicable measures in the EMP. •The contractor shall provide the details of the proposed personnel and his/her experience	•Ensure smooth operation of sewerage systems • Regular and timely maintenance

	approval; •Conduct trainings and Community Awareness and periodic meetings with stakeholders; •Submit monthly and bi-annual progress reports, including monitoring results and mitigation activities.	record for the approval of the DSC/PID. •Get permission to start work from DSC; •Carry out all of the mitigation and monitoring measures set forth in the approved EMP; •Ensure employment opportunities for the locals and maintain records of employment, and submit to the Supervising Engineer; •Carry out corrective measures as recommended by DSC/PID; •Implement any corrective or preventive actions set out in safeguards monitoring reports that PID will prepare; •Prepare an operational manual to submit to DSC; •Provide training to the monitoring personnel, and •Submit monthly reports on EMP compliance to DSC.	
Stakeholders (DoR/Traffic Office, NTC, NEA, Water Supply)	Cooperation in the meeting with other stakeholders	Supervision and coordination with PID, Municipality/Project Affected Ward and Supervision Consultant	Support to KUKL in operation and maintenance
Note: Ministry of Water Supply (MoWS), Kathmandu Valley Water Supply Management Board (KVWSMB) / Kathmandu Upatyaka Khanepani Limited (KUKL), Projection Implementation Directorate (PID), Design and Supervision Consultant (DSC)			

❖ Community Awareness

The PID will extend and expand the consultation and disclosure process during the construction period of the project. Community awareness plan (CCP) will be prepared before conducting community meeting and awareness program. A community awareness firm will be recruited to ensure on going consultations and public awareness during project implementation. A consultation at ward level has been carried out and further consultation with other stakeholder and locals will be continued. Community groups such as tole committees will be consulted and made aware of the civil works and project activities prior to construction.

❖ Grievance Redress Mechanism (GRM)

A grievance redress mechanism will be established to receive, evaluate, and facilitate the resolution of affected people's concerns, complaints, and grievances about the social and environmental performance of the project. The GRM aims to provide a trusted way to voice and resolve concerns linked to the project, and to be an effective way to address affected people's concerns. The GRM for the project is outlined below, and consists of four levels with time-bound schedules and specific persons to address grievances. The grievance redress mechanism and procedure are depicted in figure below.

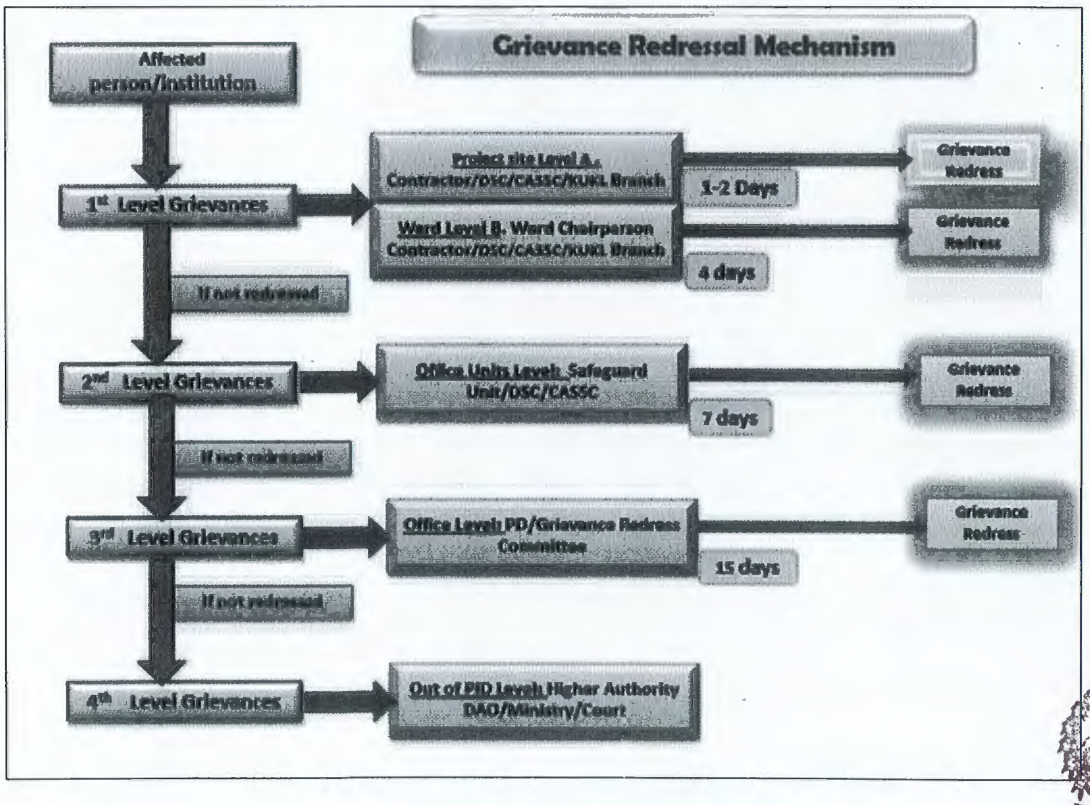

Figure 3-3: Schematic diagram of Grievance Redress Mechanism

First level of GRM;

The first level and most accessible and immediate contact for the fastest resolution of grievances are the contractors and supervision consultants on site. Prior to construction of any works the Contractors, Design and Supervision Consultant (DSC), and Community Awareness and Safeguard Support Consultant (CASSC) are to hold local community meetings to notify the local residents and businesses of the temporary disturbance, and to inform them of the project. If a local area committee (LAC) exists, they should also be informed. The PID branch offices/PID engineer can also be involved in grievance redress at this stage. If any complaints arise, the Contractors, DSC, CASSC and PID can immediately resolve the complaints on site. The KUKL hotline, PID toll free number (1139) and PID office phone numbers will be posted in public areas within the project area and construction sites. Any person with a grievance related to the project can contact the project to file a complaint. The key person in the site will document the complaint, and immediately address and resolve the issue with the contractor within 1-2 days, if the complaint remains unresolved at the field level. The first level Grievance Redress Committee may seek the assistance of the DSC and CASSC safeguards specialists (the environmental specialist or social safeguards specialist) to help resolve the issue. The first level Grievance Redress Committee will notify the PID safeguards unit that a complaint was received, and whether it was resolved. The key person in the site will fully document the following information: (i) name of the person, (ii) date complaint was received, (iii) nature of complaint, (iv) location, and (v) how the complaint was resolved.

Second level of GRM;

Should the grievance remained unresolved in recommendation of PID engineer, first level grievance redress committee will forward the complaint to the second level Grievance Redress Committee. The person filing the grievance will be notified by the first level Grievance Redress Committee that the grievance was forwarded to the PID safeguards unit. For social issues, the social officer will address the grievance; for environmental issues, it will be the environmental officer. Grievances will be resolved through continuous interactions with affected persons, and the PID safeguards unit will answer queries and resolve grievances regarding various issues, including environmental, social, or livelihood impacts. Corrective measures will be undertaken at the field level by the PID safeguards staff within 7 days. The relevant safeguards unit staff will fully document the following information: (i) name of the person, (ii) date complaint was received, (iii) nature of complaint, (iv) location, and (v) how the complaint was resolved.

Third level of GRM;

Should the grievance remain unresolved, the PID's Project Director will activate the third level of the GRM by referring the issue (with written documentation) to the local Grievance Redress Committee of KUKL, who will, based on review of the grievances, address them in consultation with the PID safeguards unit, Project Director, and

affected persons. The local GRC will consist of members of PID, affected persons, and local area committee, among others determined to provide impartial, balanced views on any issues. The GRC should consist of around 5 persons. A hearing will be called with GRC, if necessary, where the affected person can present his or her concern/issues. The process will promote conflict resolution through mediation. The local GRC will meet as necessary when there are grievances to be addressed. The local GRC will suggest corrective measures at the field level and assign clear responsibilities for implementing its decision within 15 days. The functions of the local GRC are as follows: (i) to provide support to affected persons on problems arising from environmental or social disruption, asset acquisition (if necessary), and eligibility for entitlements, compensation, and assistance; (ii) to record grievances of affected persons, categorize and prioritize them, and provide solutions within 15 days; and (iii) to report to the aggrieved parties developments regarding their grievances and decisions of GRC. The PID safeguards officers will be responsible for processing and placing all papers before the GRC, recording decisions, issuing minutes of the meetings, and taking follow-up action to see that formal orders are issued and the decisions carried out.

Fourth level of GRM;

In the event that a grievance is not addressed by the contractor, DSC, PID, or GRC, the affected person can seek legal redress of the grievance in the appropriate courts, the fourth level of the GRM, which is the formal legal court system. Below is the GRC members' composition under the project:

(i) GRC Chairman - PID Director
(ii) GRC Members:
(iii) Concerned Municipality Representative
(iv) Tole Community Representative as AP's Representative
(v) Appointed NGO Representatives as Independent Party
(vi) KUKL/KVWSMB/DSC (as relevant)

In addition to this, the approved BES report will be accessible to the interested parties and general public through the websites of KUKL/PID.

Project Implementation Directorate Kathmandu Upatyaka Khanepani Limited Estd 2003

Government of Nepal Ministry of Water Supply Singhadurbar, Kathmandu

DOHWA ENGINEERING CO., LTD. KVWMP No.DSC06 in association with ERMC • TAEC

G. Other

❖ Review of Relevant Policy, Acts, Rule and Guideline

All relevant national and international policies, laws, rules and manual were reviewed while preparing the report. Following related legal documents were reviewed during brief environmental study.

Constitution of Nepal;

The Constitution of Nepal is the fundamental law of Nepal.

Article 30 (1) of the Constitution of Nepal guarantees a ''clean environment'' as a fundamental right, and elaborates that ''every citizen shall have the right to live in a clean and healthy environment". Article 30 (3) of the constitution also encourages the state to formulate necessary legal frameworks to balance environment and development and Article 35 (4) of the constitution states that "every citizen shall have the right of access to clean drinking water and sanitation".

Environmental Protection Act, 2076 B.S. (2019 A.D);

The Environment Protection Act (EPA), 2076 obliges the proponent to prepare BES, IEE and EIA report on the prescribed proposals implementation. There are 47 Sections in EPA 2076.

Environment Protection Rules, 2077 B.S (2020 A.D);

For the implementation of Environment Protection Act (EPA) 2076 of Nepal, Government has formulated and passed Environment Protection Regulations (EPR) 2077 which has come into effect from Ashad 1, 2077. There are 50 Rules and 21 Schedules in the EPR 2077. The schedules of the EPR are very important as it supports and guides the implementation of the rules.

Table 3-11: Policy/Acts /Rules/Guidelines

S.N	Policy/Acts /Rules /Guidelines	Relevant Provisions	Remarks
1.	**Policy/Plan**		
▪	**Fifteenth Five Years Plan, (2076/77-2080/81)**	The main motto of the current 15th 5-year plan is "Prosperous Nepal, Happy Nepali" and to transform Nepal as a nation of happy, healthy, educated, dignified, and high-quality living citizens with equal opportunity, including prosperous, independent, and socialist-oriented economies. Drinking water and sanitation sectors is one of the priority areas of 15th periodic plan of Nepal. The goal for "Drinking Water and Sanitation Sector" is to enhance quality services by ensuring basic drinking-water and sanitation services to all;	To enhance sanitation services in the project area;
▪	**Water Resources Strategy, 2059 B.S. (2002 A.D.)**	Among the ten strategic outputs of this strategy, third output focuses on Adequate Supply of and access to potable water and sanitation & hygiene awareness provided;	This provision will strengthen implementation capacity for the proposed project;
▪	**National Water Plan, 2062 B.S. (2005 A.D.)**	This includes subsector-wise action programmes in water induced disasters, environmental action plan on management of watershed and aquatic ecosystem, water supply, sanitation and hygiene, irrigation for agriculture, hydropower development, industries, tourism, fisheries, and navigational uses, water related information systems (Decision Support System for River Basin Planning and Management), legal frameworks, and institutional mechanisms; • This also includes Environment Management Plan, a strategic document for the implementation of environmental protection measures (including downstream water pollution and groundwater quality, erosion/landslide and sedimentation, water pollution and sanitation, effect on aquatic life and wetland ecosystem), monitoring (baseline, impacts, and compliance), environmental auditing and institutional and procedural arrangements;	This has been considered in BES study;

▪	**National Urban Policy, 2064 B.S. (2007 A.D.)**	The policy gives importance to environment conservation while carrying out urban development works and natural resource use; thus, supporting the required environmental conservation and protection in donor-assisted development projects;	The BES study will meet the provisions of this policy;
▪	**National Urban Water Supply & Sanitation Sector Policy, 2065 B.S. (2009 A.D.)**	The Policy requires the BES/IEE/EIA of proposed WSS projects by the EPA/EPR to (i) incorporate consultations with key stakeholders, including endpoint users; & (ii) specify measures to mitigate environmental impacts before, during construction & operation, as well as corrective measures;	The BES study will meet the provisions of this policy;
▪	**Draft of National Water Supply & Sanitation Policy, 2071 B.S. (2014 A.D.)**	One of the main objectives of this policy is to reduce urban and rural poverty by ensuring equitable socio-economic development, improving health and the quality of life of the people and protection of environment through the provision of sustainable water supply & sanitation service;	The proposed project will maintain the provision of sustainable sanitation service
▪	**Land Acquisition, Rehabilitation and Resettlement Policy, 2072 B.S. (2015 A.D.)**	• Contribute to overall development of the nation and its citizens by creating a conducive environment for implementation of infrastructure development projects; • Facilitate timely execution (completion) of development projects by minimizing adverse impacts on economic, social and cultural aspects of affected families/people and the project area; • Improve social and economic status of project-affected families by providing fair and adequate compensation, appropriate resettlement and rehabilitation assistances/ allowances;	EMP provides measures to mitigate adverse environmental impacts;
▪	**Land Use Policy, 2072 B.S. (2015 A.D.)**	The mission/goal of this Policy is to manage lands in a sustainable manner by developing a specific land use system through Land Use Plans (LUPs); The strategy 3 of Policy 2 has taken into account to maintain a	The proposed project will maintain balance between construction activities and environmental aspects

		balance between physical infrastructure development and environment; and To develop green belts and open spaces along with rivers, roads, both sides of canals, among others; and the strategy 3 of Policy 10 focuses in operating construction and/or development-works, in order to keep balance between land, environment and development; the principle of sustainable development shall be adopted in view of the impact of climate change;	of the project town;
▪	**National Urban Development Strategy, 2074 B.S. (2017 A.D.)**	This strategy assesses the existing conditions of infrastructures, environment, economy and governance, establishes benchmarks and desirable standards; It identifies prioritized strategic initiatives for investment in infrastructure and environment to realize the comparative advantages of urban areas;	The BES study has duly followed this;
▪	**National Forest Policy, 2075 B.S. (2019 A.D.)**	The goals of this policy are forests, protected areas, reservoirs, biodiversity, wildlife and sustainable and participatory management of vegetation production and value addition of services and their equitable distribution. It also covers periodic assessment and updating of information on forest resources of the country; One of its 11th objective is to deliver contribution from forest area to Nepal's overall goal of reducing carbon emissions;	The proposed project does not have to deal with forest related adverse issues;
▪	**National Climate Change Policy, 2076 B.S. (2019 A.D.)**	The goal of NCCP 2076 is to contribute to socio-economic prosperity of the nation by building a climate resilient society. The objectives are: i) To enhance climate change adaptation capacity of persons, families, groups and communities vulnerable to, and at risk of climate change; ii) To build resilience of ecosystems that are at risk of adverse impacts of climate change; iii) To promoting green economy by adopting low carbon economic development concept; iv) To mobilize national and international financial resources for climate change mitigation and adaptation in just manner; v) To conduct	This will be followed during project implementation as per requirement;

		research, make effective technology development and information service delivery related to climate change; vi) To mainstream or integrate climate change issues into policies, strategies, plans and programs at all levels of State and Sectoral areas; and vii) also To mainstream gender equality and social inclusion (GESI) into climate change mitigation and adaptation programs;	
▪	**National Environmental Policy, 2076 B.S. (2019 A.D.)**	• This encourages the state to control pollution, manage wastes and promote greenery so as to ensure citizens' right to live in a fair and healthy environment. This was framed to guide the implementation of environment related laws and other thematic laws, realize international commitment and enable collaboration between all concerned government agencies and non-government organizations on environmental management actions; • The policy has entrusted the federal government with the responsibility for looking after national-level policy, law and standards related works for environmental protection and management;	EMP provides measures to mitigate adverse environmental impacts; This will be followed during the proposed project implementation phase;
2.	**Acts**		
▪	**Aquatic Animal Protection Act, 2017 B.S. (1961 A.D.) with Amendments (2055 B.S. (1997 A.D.)**	This act renders punishment to any party introducing poisonous, noxious or explosive materials into a water source or destroying any dam, bridge or water system with the intent of catching or killing aquatic life. It also emphasizes that GoN empowers to prohibit catching, killing and harming of certain kinds of aquatic animals by notification in Nepal Gazette;	Information of this act will be delivered to the construction workers;
▪	**Water Resource Act, 2049 B.S. (1992 A.D.)**	The umbrella Act governing water resource management; • This has provision of beneficial use of water resources (surface water/groundwater) without causing damage to others;	• WUSC has been formed for this proposed project as per this act;

		• Provides for the formation of water user associations and establishes a system of licensing; • Prohibits water pollution;	• There is provision of control of water pollution through protection works and strict supervision;
▪	**Land Acquisition Act, 2049 B.S. (1993 A.D.)**	It guides the compulsory acquisition of land. It also describes that GoN can acquire land at any place and in any quantity by giving compensation pursuant to the act for the land acquired for any public purposes or for operation of any development project initiated by GoN;	There is no requirement of land acquisition of private land. All the land required are under the ownership of GoN;
▪	**Child Labor Prohibition and Regulation Act, 2056 B.S. (2001 A.D.)**	The section 3 of the Act prohibits a child from engaging in work, sub-clause 1 of the clause 3 states "Nobody shall engage in work a child who has not completed fourteen years of age as a labor and sub clause 2 states "Nobody shall engage a child in a risk full occupation or work set forth in the Schedule". The section 4 states "Child not to be engaged in work against his will by temptation or fear or pressure or by any other means.	This provision has been stated in EMP;
▪	**Solid Waste Management Act, 2068 B.S. (2011 A.D.)**	Article 4 provides that the management of hazardous, medical, chemical or industrial waste rests upon the generators of such wastes. Management should be as prescribed in the Act; Article 5 provides that individuals and entities must reduce the amount of solid waste generated while carrying out work or business;	EMP prescribes eco-friendly management of solid and hazardous wastes;
▪	**Labor Act, 2074 B.S. (2017 A.D.)**	The has provisions for the rights, interest, facilities and safety of workers and employees working in enterprises of various sectors; • The Act emphasizes on occupational health and safety of workers and stipulates provision of necessary safety gears and adopting appropriate precautionary measures against potentially hazardous machine/equipment in the workplace; • It also specifies to arrange such as removal of waste accumulated during production process and prevention of dust, fume, vapor and other waste materials, which adversely affect the health of	These provisions are stated in EMP;

		workers; • It specifies the provision of controlling the communicable diseases at the construction site. It also prohibits mobilization of child as a labor. It emphasizes on the provision of temporary camp, safe drinking water and necessary food supplies to the workers;	
▪	**Local Government Operation Act, 2074 B.S. (2017 A.D.)**	The Act gives Province Government the functions, duties & powers to: (i) entrust municipalities with responsibility of WSS services, (ii) conserve & protect their local environment & natural resources; (iii) plan, implement &/or operate & maintain WS projects at local level; (iv) implement or arrange for implementation local sanitation/sewerage & drainage projects; (v) protect cultural heritage & religious sites; &/or (vi) monitor project activities within their respective jurisdictions;	Provides a basis for Local Government to monitor the environmental performance of the projects; EMP provides the responsibilities of LGs in EMP implementation;
▪	**Forest Act, 2076 B.S. (2019 A.D.)**	•The Act facilitates (i) to manage the national forest in the form of Government Managed Forest, Forest Protection Zone, Community Forest, Partnership Forest, Lease-hold Forest & Religious Forest and (ii) to contribute for national prosperity by conserving, promoting and utilizing the wild life, environment, watersheds and bio-diversity, while promoting the private, public and urban forest; •Chapter 12 of this act has provisions related to development projects. It states in regard to the use of forest area that "Notwithstanding anything contained elsewhere in this Act, if there is no other alternative to the using of forest area for the operation of a national priority project, plan of which investment is approved by the Investment Board, project of national pride and it appears from the environment examination referred to in the prevailing law that the operation of such plan does not result in significant adverse effects on the environment, the	There is no intervention of this project in the forest areas.

		Government of Nepal may give approval, as prescribed, to use any part of the national forest for the purpose of operating such plan; • It also states that "If there is no other alternative to the using of forest area for the operation of any development project by the Province or and it appears from the environment examination referred to in the prevailing law that the operation of such plan does not result in significant adverse effects on the environment, it may request the Government of Nepal for acquisition of the land in such forest area for the operation of that project;	
▪	**Land Use Act, 2076 B.S. (2019 A.D.)**	The main aim of the act is to ensure that land is properly used and managed and that land set aside for one purpose is not used for other. The act has assigned the responsibility for implementing the act to not only the federal government but also to the provincial and local governments;	Information on this act is necessary for this project to avoid misuse of land for the construction of project Components. However, as this project requires RoW of the public road for the proposed components, land misuse may not be a serious issue;
▪	**Environmental Protection Act, 2076 B.S. (2019 A.D.)**	• The Act outlines the process for the submission and approval of BES/IEE or EIA reports. • The proponent should submit the BES/IEE or EIA reports for approval process to concerned agency. No one should implement the proposals requiring BES/IEE or EIA without approval of such proposals. • The proponent should prepare EMP before the implementation of the proposal. • A section has been added for 'detailed alternative analysis' of possible adverse effects on the environment from the implementation of such a proposal.	The BES study has duly followed this;

		• The Act has also provisions for carrying out Strategic Environmental Analysis (SEA) for the prescribed policy, programme or project. • The Act has recognized the need for Supplementary EIA.	
3.	**Rules & Regulations**		
▪	**Solid Waste Management Rules, 2070 B.S. (2013 A.D.)**	• GoN has issued these rules by exercising the power conferred by the section 50 of the Solid Waste Management Act, 2068. • Section 3 of this rule focuses on Segregation & management of solid wastes.	EMP for this proposed project covers this matter focused by this rule;
▪	**Forest Regulations, 2051 B.S. (1995 A.D.)**	• This has separate provision for the protection of Community Forest along with the duties & responsibilities of Community Forest User's Group;	There is no intervention of this project in the forest areas. This regulation is reviewed as a reference only;
▪	**Drinking Water Regulations, 2055 B.S. (1998 A.D.)**	• Regulates the use of drinking water ; • Provides for the formation of Drinking Water User Associations and sets out the procedure for registration; • Deals with licensing of use drinking water; • Deals with the control of water pollution and maintenance of quality standards for drinking water; • Sets out the conditions of service utilization by consumers;	The proposed project has followed all these provisions;
▪	**Labor Rules, 2075 B.S. (2018 A.D.)**	• GoN has issued these rules by exercising the power conferred to it under the section 184 of the Labor Act, 2074; • Section 7 of these rules deals with Occupational Safety & Health Policy;	EMP for this proposed project covers this matter focused by this rule;
▪	**Environment Protection Rules, 2077 B.S (2020 A.D)**	• The EPR, 2077 elaborates provisions to prepare and submit the scoping report, Work Schedule, and BES/IEE/EIA report for approval and includes public hearing process. • The EPR, 2077, Schedule 1, 2 and 3 contains a list of proposals, which require either BES/IEE or EIA. • The proponent should conduct public hearing and affix a notice in	The BES study has duly followed this;

		local level office, and common place to inform the local level concerned individual or institutions about the public hearing. EPR, 2077 obliges the proponent to publish a 7-day public notice in a national/daily newspaper and in their website about proposed project. • A notice should be published in the format as indicated in Schedule-9. • The proponent should prepare BES, IEE and EIA report in the format as indicated in Schedule-10, Schedule-11 and Schedule-12 of EPR; 2077.	
4.	**Guidelines & Standards**		
▪	**National EIA Guidelines, 2049 B.S. (1993 A.D.)**	This guidelines aims to assess the environmental impacts likely to be caused by a project, and promote its positive impacts and mitigate or eliminate adverse impacts by undertaking preventive and other effective measures after integrating the environmental impacts in the planning cycle of all the projects to be initiated in Nepal, prior to their initiation, so as to make the economic benefits from development projects sustainable;	This has been followed for evaluation of the anticipated environmental Impacts;
▪	**National Noise Standard Guidelines, 2068 B.S. (2012 A.D.)**	It provides basis for national standards in noise quality that are designed to offer guidance in reducing the health impacts of noise pollution;	During noise quality monitoring, this guideline will be followed;

Nepal is also a signatory to many international agreements and conventions related to environmental conservation such as:

- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973 A.D
- Convention Concerning the Protection of World Cultural and Natural Heritage (World Heritage Convention), 1972 A.D
- Convention on Biological Diversity, 1992 A.D

H. Conclusions

This Brief Environmental Study report is prepared for sewer network at Gokarna that will be upgrading and constructed at Sundarijal, Nayapati Gokarna of Gokarneshwor Municipality of Kathmandu District. This BES report is based on preliminary design for analysing possible environmental impacts.

The purpose of project "Sewer Network at Gokarna" is to transport all the sewage from the Gokarna area to Gokarna DEWATS and ultimately discharge clean water to the Bagmati river. This project will raise the quality of sewer services in the selected areas of Gokarneshwor Municipality, thereby cutting dispose of sewage to river. The project is expected to improve the river water quality at the Gokarna area and ultimately improve the health and hygiene of people and quality of life for inhabitants of Kathmandu Valley.

There will be some adverse impact due construction and operation of the project. Construction activities like top soil scraping, earthwork excavations, dismantling temporary facilities, operation of construction machineries/plant/equipment's/vehicles, movements of vehicles, rehabilitation/restoration/compaction and operation of labour camps will cause air pollution, land pollution, water pollution, noise pollution, generation of waste, damage to existing physical structures, traffic congestion and disturbance to the surrounding environment.

Overall, the impacts of the project will be very positive, benefitting the environment and the people. Some adverse impacts are anticipated during implementation but in specific areas and for short duration. It is expected that the adverse environmental impacts of the proposed project will in general not be significant and can be reduced and/ or prevented through mitigation measures and regular monitoring during the construction and operation phases.

Project Implementation Directorate ★ Kathmandu Upatyaka Khanepani Limited ★ Est. 2059

Government of Nepal
Ministry of Water Supply
Singhadurbar, Kathmandu

DOHWA ENGINEERING CO., LTD. ★ ERMC ★ TAEC

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APPENDICES

1. Appendix-I Approved Terms of Reference (ToR)
2. Appendix-II Maps
3. Appendix-III Public Hearing Notice
4. Appendix-IV Muchulka / Deed of Enquiry of Public Hearing Notice
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Appendix-I: Approved Terms of Reference (ToR)

नेपाल सरकार
खानेपानी मन्त्रालय

सिंहदरबार
काठमाडौं, नेपाल ।

पत्र संख्या : ०८०/०८१
चलानी नं : ५६७

मिति : २०७८।०३।३१

श्री आयोजना कार्यान्वयन निर्देशनालय,
अनामनगर, काठमाडौं ।

विषय: संक्षिप्त वातावरणीय अध्ययन (BES) को कार्यसूची (TOR) स्विकृति सम्बन्धमा ।

प्रस्तुत विषयमा तहाँबाट स्वीकृतीको लागि पेश भै आएको देहायको आयोजनाको संक्षिप्त वातावरणीय अध्ययन (BES) को कार्यसूची नेपाल सरकार (सचिवस्तर) को मिति २०७८/०३/३० को निर्णयानुसार प्राप्त कार्यसूचीमा उल्लेख गरिएका Issue/Impact का अलावा प्रतिवेदन तयारीका समयमा अन्य Issue/Impact देखा परेमा सो पनि समावेश गर्नुपर्ने शर्तमा प्राप्त कार्यसूची वातावरण संरक्षण नियमावली, २०७७ को नियम ५ को उपनियम (१) र (२) बमोजिम स्वीकृत भएको व्यहोरा आदेशानुसार अनुरोध छ ।

आयोजना :

१ काठमाडौं उपत्यका ढल व्यवस्थापन आयोजना - काठमाडौं ।

संक्षिप्त वातावरणीय अध्ययनको कार्यसूची प्रतिवेदन १ प्रति यसै साथ संलग्न छ ।

KUKL
Regd No. 6916
Date 078-3-25

Environment and safeguard unit
2078/04/03

(दिपक महर्जन)
ईन्जिनियर

सक्षम निजामति प्रशासन : विकास समृद्धि र सुशासन

Government of Nepal
Ministry of Water Supply
Singhadurbar, Kathmandu

Terms of Reference (ToR)
for
Brief Environmental Study (BES)
of
Sewer Network at Gokarna
(Bagmati Province)

Submitted to:

Government of Nepal
Ministry of Water Supply
Singhadurbar, Kathmandu

Submitted by:

Project Implementation Directorate,
Kathmandu Upatyaka Khanepani
Limited
Anamnagar, Kathmandu

Prepared by:

DOHWA Engineering Co Ltd
in association with ERMC/ TAEC
Anamnagar, Kathmandu

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ABBREVIATIONS

ADB	Asian Development Bank
DSC	Design and Supervision Consultant
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environment Protection Act
EPR	Environment Protection Rules
ERMC	Environment Resource and Management Consultant
GRM	Grievance Redress Mechanism
BES	Brief Environmental Study
KUKL	Kathmandu Upatyaka Khanepani Limited
MoWS	Ministry of Water Supply
PID	Project Implementation Directorate
ToR	Terms of Reference

1 NAME AND ADDRESS OF THE INSTITUTION PREPARING THE REPORT

1.1 Introduction of the Proponent

The Proponent of this project is Project Implementation Directorate (PID), Kathmandu Upatyaka Khanepani Limited (KUKL), Kathmandu. KUKL is a leading agency for implementation of water supply and wastewater management projects. The Ministry of Water Supply (MoWS) is the executing agency responsible for overall strategic planning, guidance, and management of the project.

Name and Address of the Proponent

Project Implementation Directorate (PID)
Kathmandu Upatyaka Khanepani Limited (KUKL)
Tankaprasad Ghumtimarg, Anamnagar, Kathmandu
Tel: +977-1 5705656, 977-1 5705916, 977-1 5705771
E-mail: pidmail@kuklpid.org.np
Website: www.kuklpid.org.np

1.2 Name and Address of the Consultant Preparing the Report

The present Terms of Reference (ToR) has been prepared for the execution of Brief Environmental Study (BES) for Sewer Network at Gokarna. The ToR has been prepared pertaining to Rule 5 and as per the format indicated in Schedule 6 of EPR, 2077. The ToR is prepared on behalf of the project proponent by the following Consultancy:

DOHWA Engineering Co. Ltd in association with Environment Resource Management Consultant (ERMC)/TAEC
Tankaprasad Ghumtimarg, Anamnagar, Kathmandu
Tel: +977-15705884
Email: dohwa2018@gmail.com

DOHWA ENGINEERING CO., LTD. KUWMP No.DSC06 In association with ERMC • TAEC

नेपाल सरकार
खानेपानी मन्त्रालय
सिंहदरबार

Project Implementation Directorate
Kathmandu Upatyaka Khanepani Limited
Estd 2009

2 INTRODUCTION OF THE PROPOSAL

2.1 General Introduction

Kathmandu Valley Wastewater Management Project (KVWMP) is supporting the ongoing efforts of the Government of Nepal towards improving the wastewater services in Kathmandu Valley by maximizing efficiency and effectiveness of existing system and services provision through restoration and establishment. The purpose of this project is to collect sewer water at Gokarna area and to transfer it into the DEWATS that will be constructed at Gokarna. Land acquisition or dislocation of any private and public structures is not required for the construction of this project. Rather, there will be positive impacts in local community because of the sewer water management.

2.1.1 Description of the Proposal

Sewer network at Gokarna is the project package to design, construct and rehabilitate sewers in Gokarna, Gokarneswor Municipality in order to improve the network and substantiate the waste water to bring into new DEWATS at Gokarna. The length of the sewers has been determined to be 5.26 km. Plastic DWC and RCC pipes of 0.3 (24%), 0.4 (17%). 0.5 (19%), 0.6 (25%), and 0.8 (15%) m dia will be laid in this project, in which the longest length of pipe size will be 0.6 m (about 1.3 km) and shortest length of pipe will be 0.8 m dia (about 0.8 km). Sewer line starts with small size of 300 mm diameter whose total length is 1.27 Km and the largest pipe dia is 800 mm with 0.82 Km length. Sewers will be laid for main line of about 2.13 Km, secondary line of about 2.23 Km and branch line of about 0.59 Km. Out of the 5.26 km total sewer length, 0.36 km of sewers have 1-2 meters of depth of excavation, 3.38 km of sewers have 2-3 meters of depth of excavation, 1.18 km has 3-4 meters and only 0.34 km has 4-4.8 meters depth of excavation.

Figure 2-1: Map showing the proposed sewer network site

2.1.2 Service Area and Population Coverage

The service area lies in 3 wards (ward 1, 2 and 4) of Gokarna Municipality which have mostly higher density of population. The total contributing area is 221 ha with higher areas from wards 2 and 4. However, the sewer line is splitted into two phases. In the first phase, the sewer lines are designed only for Gokarna ward no 4, though the capacity of pipes consider the service area of ward no 1 and 2. The basis of the population estimation of the project area is the 2001 and 2011 census population. The census population of the service area is 12,191 in 2001 and 17,317 in 2011. The floating population is uncertain in these areas. Therefore, the future population of the service area has been estimated based on future population density, which has been predicted based on the census population, the area coverage, population growth rate and floating population. The design population of the service area adopted for the design horizon 2036 is 49,500.

2.1.3 Location of the Proposed Project

The Contributing areas considered on this package is a large area that lies in wards 1,2 and 4 (Sundarijal, Nayapati, and Gokarna) of Gokarneswor Municipality as shown in The Figure 2-2. Gokarneswor Municipality lies between the latitudes 27° 42' 38" and 27° 49' 2" north and longitudes 85° 21' 50" and 85° 28' 17" east. It is located at elevation range from 1320 to 2200 meters above sea level.

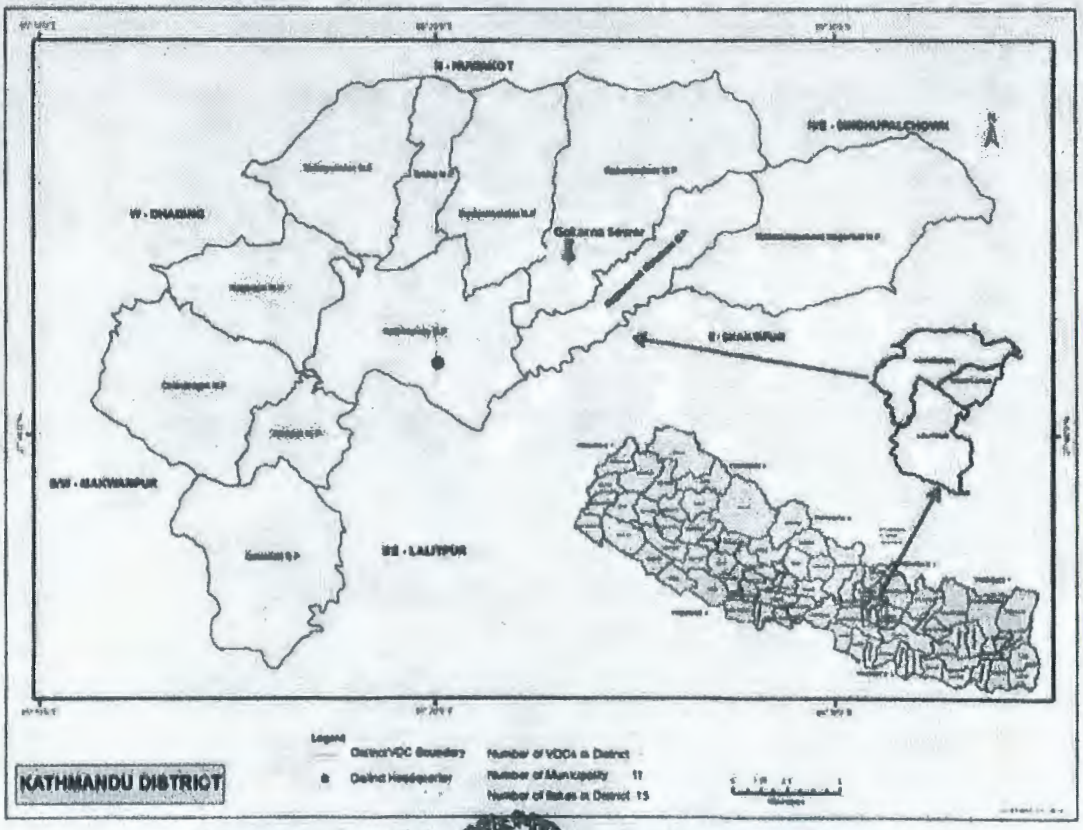

Figure 2-2: Location Map of Sewer Network at Gokarna

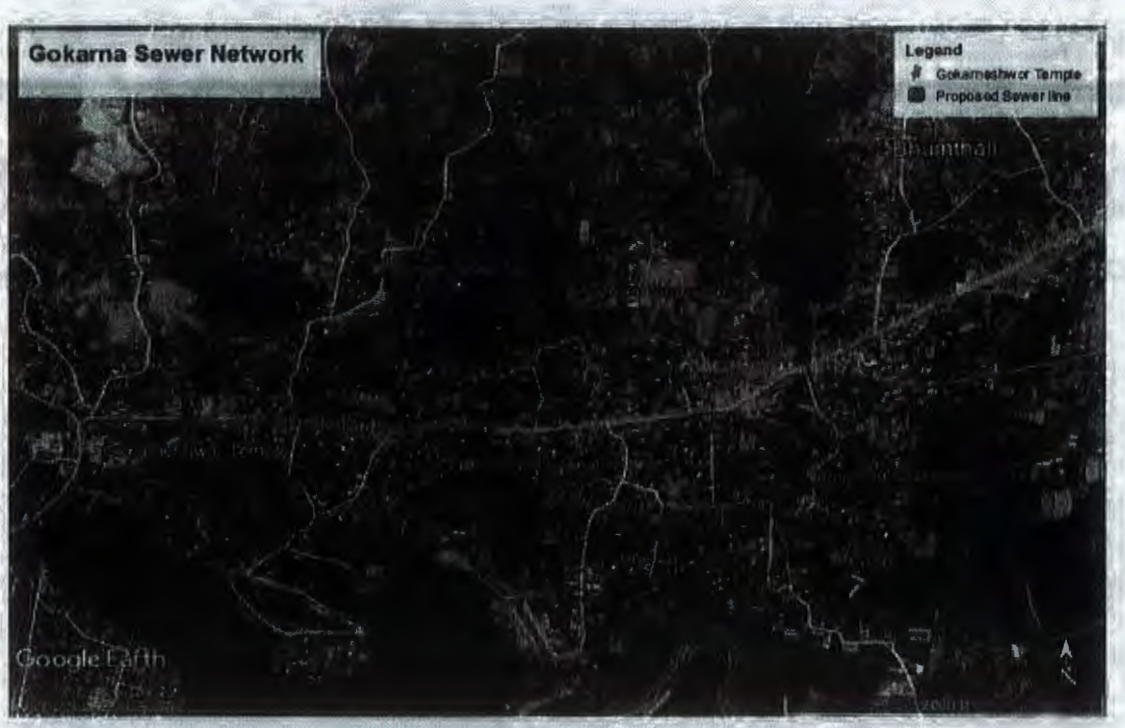

Figure 2-3: Location of Map of Sewer Network at Gokarna

2.1.4 Salient Feature

Salient feature of the proposed sewer network project is described in table below.

Table 2-1: Salient Features of Sewer Network at Gokarna

SN	Particulars	Description
1.	Name of the Project	"Sewer Network at Gokarna"
2.	Location of the Project	
	Province	3
	District	Kathmandu
	Municipality	Gokarneshwor Municipality, wards 1,2 and 4
3.	Service Area	Ward number 1, 2 and 4 of Gokarneshwor Municipality
4.	Population Coverage	Base Year Population (2023): 19,335 Design Year Population (2036): 49,500
5.	Sewer Network Components	DWC Pipe, RCC Pipe, Manhole, Overflow structure, Sewer Outfall, Aqueduct, River training works
6.	Proponent	KUKL/ Project Implementation Directorate
7.	Funding Agency	Government of Nepal and Asian Development Bank

2.2 Relevancy of the Project

Gokarneshwor Municipality along with Kathmandu district is being in the phase of rapid and unplanned urbanization and industrialization without adequate infrastructure

development. Improvement and upgrading of sewer network of Gokarna area is urgently needed because the area is fast growing and there is lack of good sewer network system. Lack of operational wastewater system facilities has converted the holy Bagmati River into a highly polluted watercourse. To treat the wastewater, Gokarna DEWATS has been designed and will be constructed soon. As the Gokarna DEWATS project plan is to treat all the sewage from the Gokarna area and discharge relatively clean water to Bagmati River, the network to transport to the DEWATS inlet facility is essential. Therefore, this project is proposed to transport all the sewage from the Gokarna area to Gokarna DEWATS and ultimately discharge clean water to the Bagmati river. This project has been designed to raise the quality of sewer network and services in the selected areas of Gokarneswor Municipality, thereby cutting dispose of sewage to Bagmati River enhancing clean water in the river.

As the proposed project fall within the definition provided in the EPR, 2077 Schedule 1 under Waste Management Sector, I(b) (Schedule revised on 2078/02/10) which states "Working on sewage, sanitation, or waste management aimed at supporting a population of up to 50,000 (Base year population)" **(५०,००० सम्मका जनसङ्ख्यालाई (आधार वर्ष) टेवा पुऱ्याउने उद्देश्यले सञ्चालन हुने ढल निकास, सरसफाई वा फोहरमैला व्यवस्थापन कार्य गर्ने),** hence the project needs to go through Brief Environmental Study (BES). This Term of Reference (ToR) has been prepared pertaining to Rule 5 of EPR, 2077 as per the format indicated in Schedule 6 of EPR, 2077.

DOHWA ENGINEERING CO., LTD. KVWMP No.DSC06 in association with ERMC • TAEC

Project Implementation Directorate Kathmandu Upatyaka Khanepani Limited Estd 2003

नेपाल सरकार

3 REVIEW OF RELEVANT ACTS, REGULATION AND GUIDELINE

All relevant national and international policies, laws, rules and manual will be reviewed while preparing the report. Following related legal documents will be reviewed during BES study.

3.1 Review of constitution and policies

- Constitution of Nepal

Policies

- National environment policy 2076 B.S
- The National Urban Policy (2007 A.D)
- The National Urban Water Supply and Sanitation Sector Policy (2009 A.D.)
- National Forest Policy, 2075 BS
- National climate change policy, 2076 B.S

3.2 Review of Acts and Regulations

- Environment Protection Act, 2076 B.S
- Environment Protection Rules, 2077 B.S
- Local Governance Operationalization Act, 2074 (2017 A.D)
- Nepal Water Supply Corporation Act (2007 A.D)
- Ancient Monuments Protection Act (1991 A.D)
- Land Acquisition Act 2034 B.S (1978 A.D)
- Solid Waste Management Act 2011 (2068 BS)
- Child Labour (Prohibition and Regulation) Act, 2000 (2056)
- Water Resources Act 2049 B.S (1992 A.D) and Regulations 2050 B.S (1993 A.D)
- Labor Act (2074 B.S)
- Labor Rules (2018 A.D)
- Forest Act, 2076 B.S
- Forest Regulations, 2071 B.S

3.3 Review of Guideline and Manuals

- National EIA Guidelines,1993 A.D
- Environmental Management Guidelines, GESU/DoR, July, 1997 A.D
- Fourteenth Plan (fiscal year 2073/74-2075/76)
- National Adaptation Program of Action (NAPA) 2010 A.D
- National Standard for Sound Quality, 2069 B.S
- National Ambient Air Quality Standard, 2069 (2012 A.D)
- Local Level Administration Operation Order, 2073 B.S
- Urban Environmental Management Directives (2011 A.D)

Nepal is also a signatory to many international agreements and conventions related to environmental conservation such as:

- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973 A.D
- Convention Concerning the Protection of World Cultural and Natural Heritage (World Heritage Convention), 1972 A.D
- Convention on Biological Diversity, 1992 A.D

4 SPECIFIC IMPACT OF THE IMPLEMENTATION OF THE PROPOSAL ON THE ENVIRONMENT

The likely beneficial and significant adverse environmental impacts from the implementation of proposal during construction and operation stages upon Physical, Biological, Socio-economic and Cultural environment will be identified and predicted that will be further assessed by the study will be described as the following sub-sections. Site specific, local/national impacts will be identified during the study. Furthermore, the impact will be characterized according to EIA guidelines 1993.

- Low, high & medium in terms of magnitude
- Long term, short term and medium term in terms of duration
- Site specific, local and regional in terms of extent

4.1 Beneficial Impacts

Beneficial impacts due to implementation of the proposal during construction and operation of the sub-project will be assessed and further enhancement measures will be suggested. They will be related mainly to raise the livelihoods of the local people. The likely beneficial impacts envisaged during construction and operation stages are:

4.1.1 Construction phase

- Employment generation to the local people during construction phase
- Local level entrepreneurship development
- Skills enhancement of the local workers

4.1.2 Operation Phase

- Enhancement of existing sewer network within the core area
- Clean environment

4.2 Adverse Impacts

The project activities during construction and in subsequent operation and maintenance stages may create a number of adverse impacts on environment due to the interaction between project actions and local environment. The likely adverse impacts during construction and subsequent operation and maintenance stages in terms of Physical, Biological, Socio-economic and Cultural environment due to the project actions, as stated in the following sections, will be identified, predicted and evaluated.

Adverse Impacts will be considered in three major phases:

4.2.1 Pre- Construction Phase (Design Phase)

One of the most important activities before construction is the identification of the likely adverse impacts and their mitigation measures before construction works commence. Some impacts that are likely to occur during the pre-construction phase are listed below:

- Establishment of Labor camp
- Social conflict/Obstruction
- Disturbance to the surrounding environment

4.2.2 Construction Phase

Socio and Economic Environment

- Damaged of infrastructures and community services
- Traffic Congestion/Temporary disturbance to local access
- Disturbance to locals
- Increase in crime and community stress
- Impact on health and hygiene of workers
- Impact on health and safety of community
- Obstruction in social, cultural and religious activities

Physical Environment

- Change in soil quality
- Soil erosion and slope stability
- Air pollution
- Water pollution
- Land pollution
- Noise Pollution and vibrations
- Damage to existing physical structures
- Generation of waste

Biological Environment

All the project component lies in urban area along the existing road of project sites. So, clearance of tree and vegetation is not required. There will not be any direct impact to the birds, animals and aquatic life as well.

4.2.3 Operation Phase

- Health and safety of cleaning staff at risk
- Overflow flooding due to failure of the sewerage system

Apart from these major environmental issues, other impacts/issues if identified will be discussed in the BES report.

5 MATTERS CONCERNING THE PREVENTION OF THE IMPACT OF THE IMPLEMENTATION OF THE PROPOSAL ON THE ENVIRONMENT (MITIGATION MEASURE)

Environmental impacts on the physical, biological, and socio-economic and cultural environments during design, construction, and operation phases will be discussed in detail together with the mitigating measures while preparing BES report. However impact can be both beneficial as well as adverse. The mitigation measures will mainly include compensatory, corrective and preventive measures.

Equally, the benefit enhancement measures will also be designed and suggested. The proposed project will have positive impact on health and quality of life for inhabitants of Kathmandu Valley.

Mitigation measures will be presented in matrix format. Mitigation measures will be incorporated in project design phase, project construction phase, project operation phase.

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6 MATTER TO BE MONITORED WHILE IMPLEMENTING THE PROPOSAL

6.1 Environment Management Plan

Environment Management Plan is an integral part of the BES report. The basic objective of the EMP is to ensure that all mitigation measures and monitoring requirements will actually be carried out at different stages of project - preconstruction, construction and operation and maintenance. EMP will include the responsibilities of different stakeholders based on preliminary plans and schedules. EMP will include proposed work program, budget estimates, schedules, staffing and training requirement and other support services to implement the mitigation measures. Feasible and cost effectiveness measures to prevent/mitigate/reduce significant negative impacts will be recommended in an Environment Management Plan.

6.2 Environment Monitoring Plan

Environment monitoring plan will provide detail on when the environmental control activities need to be carried out, who is responsible and what methods will be used to measure effectiveness. Environment monitoring plan will be developed for the pre-construction, construction and operation activities of the project. Environmental monitoring plan will include field supervision and reporting of project activities prior to and during the project construction and operation in order to ensure that the works are being carried out in accordance to the approved design and that the environmental mitigation measures are fully implemented in accordance with the EMP.

Environmental Management Plan (EMP) including monitoring plan will be prepared to address the adverse impacts and enhance beneficial impacts during planning, construction and operation.

6.3 Information Disclosure, Public Consultation and Participation

Public participation is an active and constructive exchange of information, meanings, and opinions. It is a two way processes that informs and involves the community in developing project and informs the proponent about the issues and concerns.

Information will be disclosed through pubic consultation, public hearing and more formally by making document and other materials available in a form and at a location in which they can be easily accessed by stakeholders.

Affected people can influence the project to reduce adverse impacts, maximize ancillary benefits, and ensure that they receive appropriate compensation. Additional opportunities will arise during project design to ensure that vulnerable groups are given special attention, that equity issues are considered and that the needs of the poor receive priority.

6.4 Grievance Redress Mechanism

A grievance redress mechanism (GRM) will be established to receive, evaluate, and facilitate the resolution of affected people's concerns, complaints, and grievances about the social and environmental performance of the project. The GRM will provide a trusted way to voice and resolve concerns linked to the project, and to be an effective way to address affected people's concerns. The GRM for the project is outlined in Figure 6-1, and consists of four levels with time-bound schedules and specific persons to address grievance.

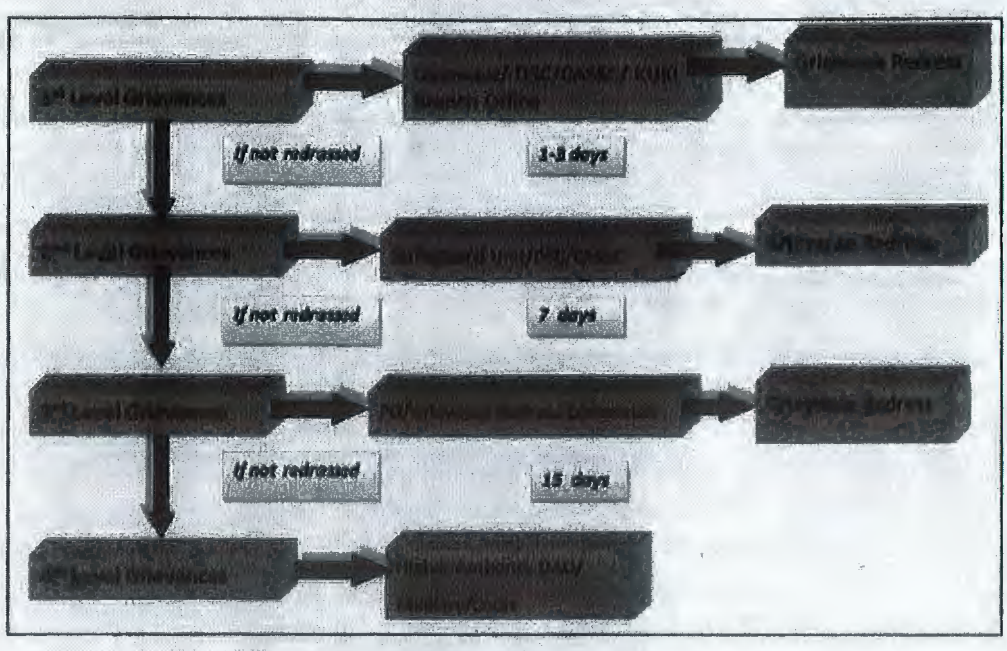


Figure 6-1: Schematic diagram of Grievance Redress Mechanism

7 OTHER NECESSARY MATTERS

The other necessary matters to be included in the BES report will be the information relevant to project, reference lists, annexes, google image and topo maps, photographs, tables and charts. It will also include questionnaires to be used for baseline data collection.

References

1) Government of Nepal, Environment Protection Act, 2076
2) Government of Nepal, Environment Protection Rule, 2077
3) National EIA Guidelines, 2050

APPENDIX

Appendix 1: Screening Checklist

No	Item	Details				
INTRODUCTION						
1.	District					
2.	VDC-ward					
3.	Name of place					
4.	Brief description of the project					
5.	Does the site /project require any;					
		Yes	**No**	If yes give the extent (in ha)		
	Reclamation of land, wetlands					
	Clearing of forest					
	Felling of trees					
6.	Minimum land area required for the proposed development (ha)	.....ha. .....Sq.m.				
7.	Available total land area within the identified location (ha)	More than .....ha.				
8.	Expected construction period	..... Months.				
9.	Responsible contact person with contact Information					
10.	Present Land Ownership	State	Private	Other (specify)		
11.	Source of Funding	GON				
12.	Total Cost of the Project	NRs.				
13.	Anticipated Date of Completion	.....				
DESCRIPTION OF THE ENVIRONMENT						
PHYSICAL						
14.	Topography & Landforms (map)	Google Map attached in the Screening Report.				
15.	Slope	Low <30%	Medium 30-40 %	High 40-60 %	Very High > 60%	
16.	Climate	Wet Zone	Intermediate Zone	Dry Zone/ Semi-Arid Zone		
17.	Annual dry period					
18.	Source of fresh Surface Water	Spring/canal	Tank/Reservoir	Perennial Stream	Seasonal Stream	None
19.	Surface Water Use	Domestic	Washing/ Bathing	Irrigation	Animal use	
20.	Surface Water Quality (River)	Poor	Moderate	Good		
21.	Ground Water Availability	Dug Well	Tube Well	Not available		
22.	Ground Water Use	Domestic/ Washing / Bathing	Irrigation	Animal use	N/A	
23.	Incidence of Natural Disasters	Floods	Prolonged droughts	Cyclones/tidal waves	N/A	
24.	Geological Hazards	Landslides	Rock falls	Subsidence	N/A	

ECOLOGICAL						
25.	Habitat Types in the Project Site					
26.	Habitat types within 250m radius from the site periphery					
27.	Habitat types within 500m radius from the site periphery					
28.	Are there any environmentally and culturally sensitive areas within 250m?	Protected Areas	Migratory pathways of animals	Archeol ogical sites	Wetlands – Mahesh khola stream at 100m	National Parks and Conservat ion
29.	Are there any plants of conservation importance within 250m (endemic and threatened species)? If yes, encouraged to provide a list					
30.	Are there any animals of conservation importance within 250m (endemic and threatened species)? If yes, encouraged to provide a list					

ENVIRONMENTAL SENSITIVITY				
31.	Does the project wholly or partly fall within any of the following areas?			
	Area	**Yes**	**No**	**Unaware**
	Any erodible area			
	Any Flood prone and other dangerous areas			
	Any flood protection area			
	60 meters from the bank of a public stream			
	Any reservations beyond the full supply level of a reservoir			
	Any archaeological reserve, ancient or protected monument			
	Within a distance of one mile of the boundary of a National Park, wild life sanctuaries and conservation area			
	Residential, school and hospital area			
	Area with main sources of public water supply			
SOCIAL SENSETIVITY				
32.	**Area**	**Yes**	**No**	**Unaware**
	Proposed land area is belonged to Indigenous people			
	Land owners are completely depending for the subsistence upon the land intended to acquire			
	Land will be acquired without any compensation			
	The location is of cultural significance			
	The land is under a case and is still to be heard			
	The land is still under a tenancy and has been plugging and growing crops for someone's subsistence			
	The land is highly productive, fertile and irrigated land			
	The land comprises huge number of fruit trees established as orchard			

SOCIAL AND ENVIRONMENTAL IMPACT AND MITIGATION / ENHANCEMENT DURING CONSTRUCTION PERIOD						
	IMPACT	Category of Impact				MITIGATION/ ENHANCEMENT
		High	Medium	Low	✓/ x	
33.	Soil erosion					
34.	Water pollution					
35.	Noise pollution					
36.	Air pollution					
37.	Harvest or exploit a significant amount of natural resources such as trees, wood for fuel or water					
38.	Habitat loss or fragmentation					
39.	General disturbance to animal behaviour					
40.	Interference with normal movement of animals					
41.	Irreversible/irreparable environmental change					
42.	Affect the quantity or quality of surface waters (e.g. rivers, streams, wetlands), or groundwater (e.g. wells)					
43.	Result in the production of solid or liquid waste, or result in an increase in waste production, during construction or operation?					
44.	Acquisition of land for the project					
45.	Acquisition will displace the people and will make them more vulnerable to their livelihood?					
46.	Use land that is currently occupied or regularly used for productive purposes (e.g. gardening, farming, pasture, fishing, forests)					
47.	Resettlement of more than 25 people?					
48.	Vulnerable or Indigenous People					

SOCIAL AND ENVIRONMENTAL IMPACT AND MITIGATION / ENHANCEMENT DURING OPERATION PERIOD							
49.	Sewerage Disposal	Pool			Sewage Pond		
		Septic Tank			Other		
50.	Solid Waste Disposal	Either in a compost bin or in an excavated pit with cover					
51.	Drinking Water Supply	Common Dug Well		Individual dug well			
		Common Tube Well		Town supply – pipe			
		Spring		Town supply – Stand post			
52.	Alteration to storm water drainage pattern	No changes	No major Changes	Major changes			
53.	Land acquisition	Land compensation	Cash Compensation	Involuntary resettlement			
CONTACT DETAILS OF OFFICIALS AND RECOMMENDATIONS							
54.	Name of the officer completed the form (From the Developer)	....., Ph:					
55.	Designation and contact Information						
56.	List of team members who filled this form						
57.	Overall observation and recommendation						
58.	Signature and date						

CERTIFICATION: We certify that we have thoroughly examined all the potential adverse effects of this project. To the best of our knowledge, all the aforementioned information is correct and will be adequate to avoid or minimize all adverse environmental and social impacts. No further social and environmental assessment will be required to execute the construction of proposed axle load bridge station.

Study team:

Name	Designation	Organization	Signature

Appendix 2: Checklist and Questionnaire to be used in BES study

Potential impact area	Construction phase			Operational phase		
	Adverse effect	No effect	Beneficial effect	Adverse effect	No effect	Beneficial effect
A. Land Use						
Open space						
Recreational area						
Agricultural land						
Residential area						
Commercial area						
Industrial area						
B. Water resources						
Quality of water						
Irrigation						
Drainage						
Ground water						
C. Air quality						
Oxides (sulphur, carbon, nitrogen)						
Particulate matters						
Chemicals						
Odors						
Gases						
D. Public service systems						
Employment opportunities						
Schools						
Police						
Fire protection						
Water and power						

Potential impact area	Construction phase			Operational phase		
	Adverse effect	No effect	Beneficial effect	Adverse effect	No effect	Beneficial effect
system						
Sewerage system						
E. Biological conditions						
Wildlife						
Trees, shrubs						
Non timber forests products						
F. Transportation systems						
Automobiles						
Trucking						
Safety						
Movement						
G. Noise and vibration						
On-site						
Off-site						
H. Aesthetic						
Scenery						
Structures						
I. Other						

Questionnaire for interview, interaction and discussion

1. In your view; what are the major adverse environmental impacts in Physical, Biological and Socio-economic and cultural aspects with the construction and operation of the sewer line?

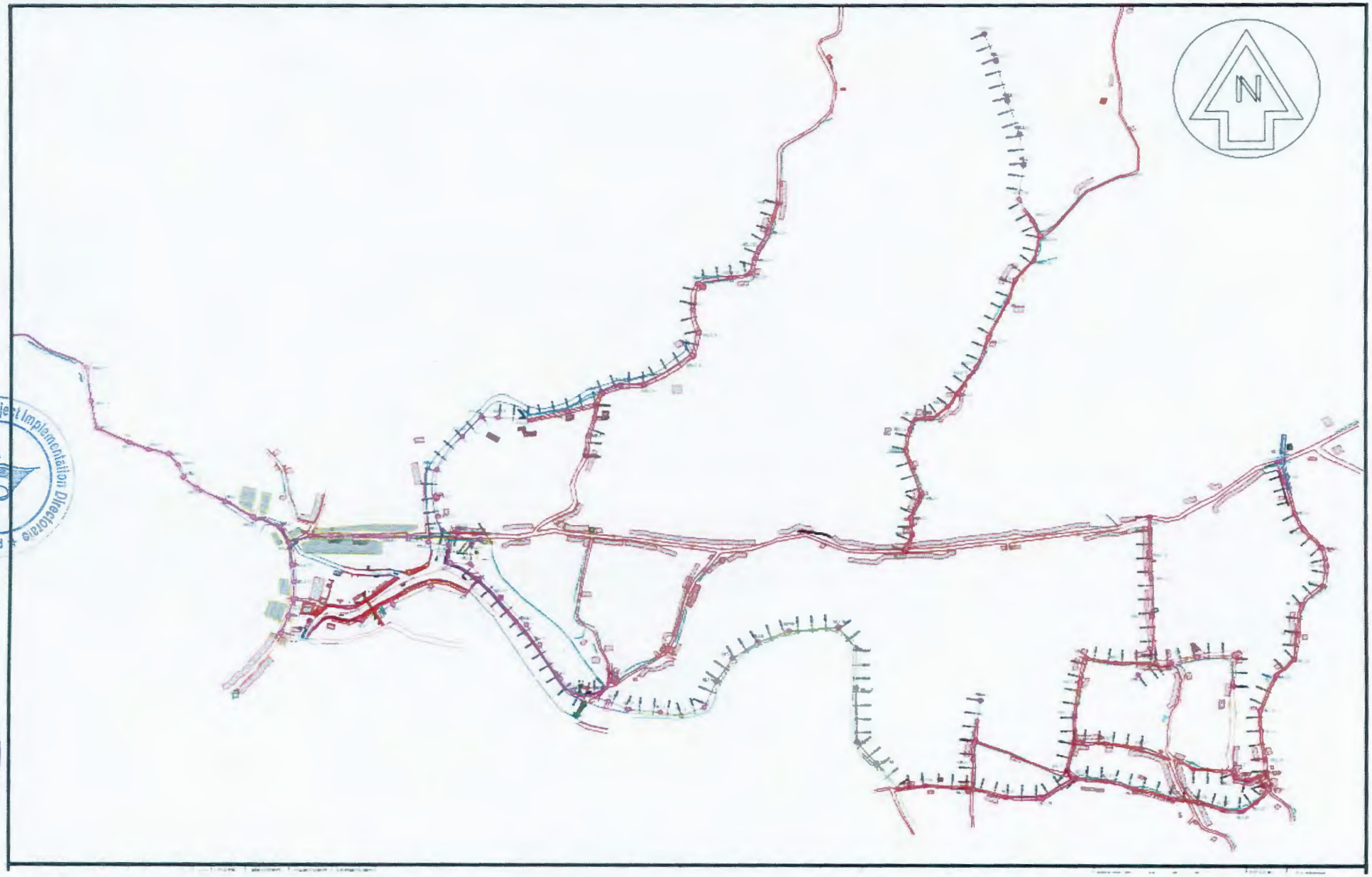
2. What could be the major beneficial impacts with the operation of the sewer line?

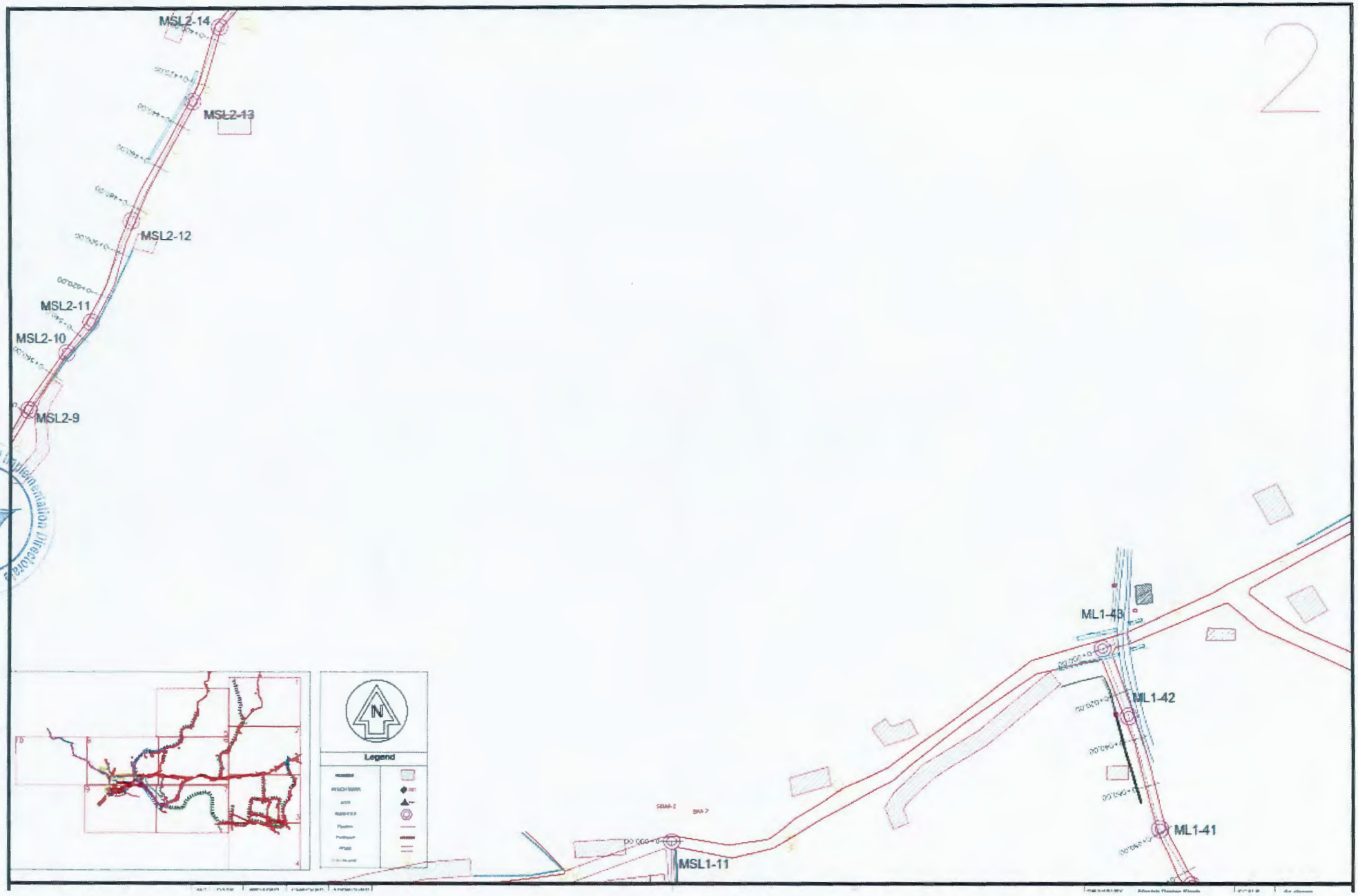
3. In your view, what should be done to mitigate the adverse environmental impacts that you have mentioned?

4. Do you have any suggestions to safeguard social and environmental condition of the project area with its implementation and operation?

Appendix-II: Maps

i) **Overall plan of Gokarna Sewer Network**

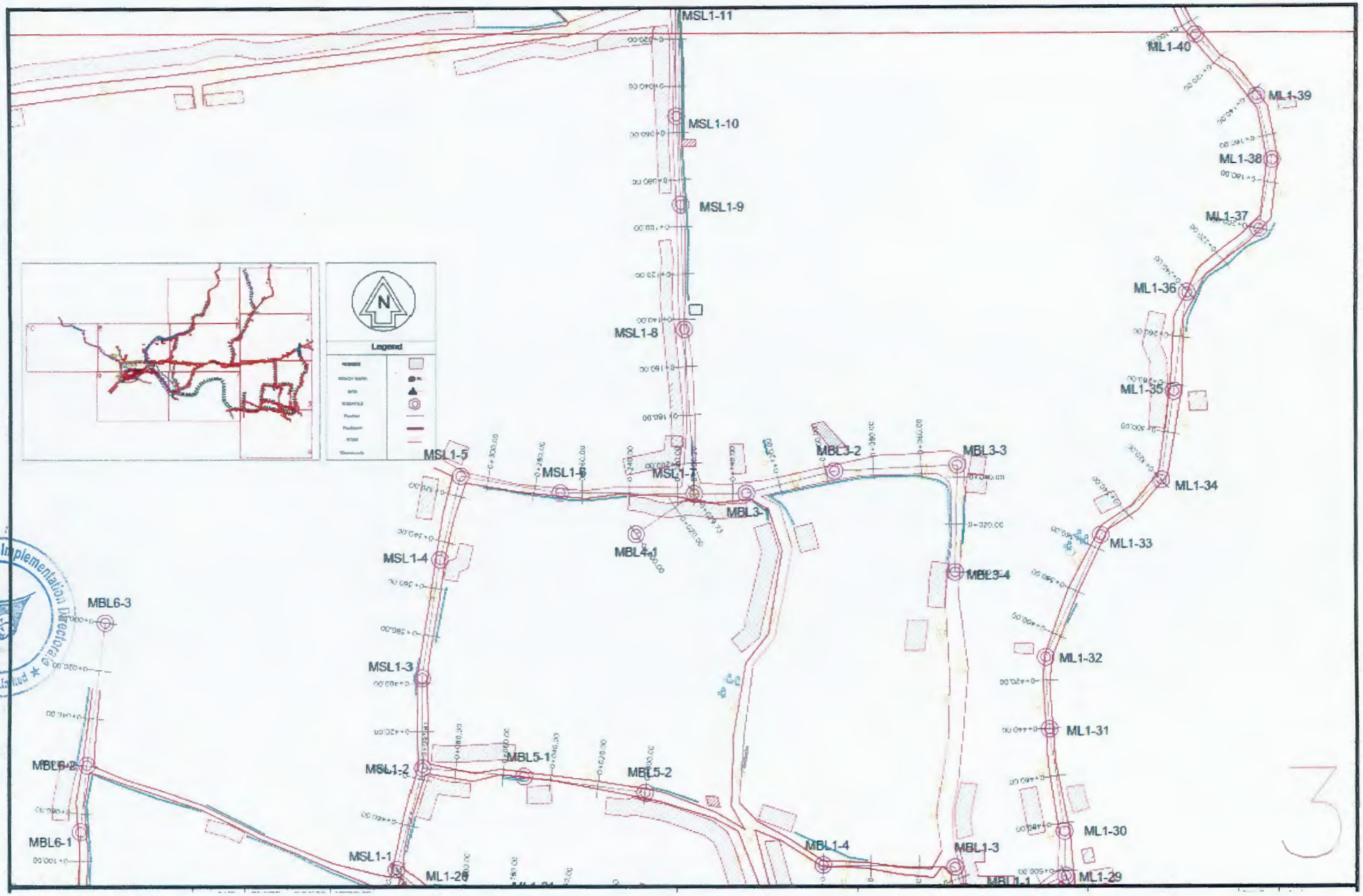




2

Project Implementation Unit
Kathmandu Upatyaka Khanepani Limited
Established 2009

DOHWA ENGINEERING CO., LTD.
KVWMP
No.DSC06
In association with
ERM



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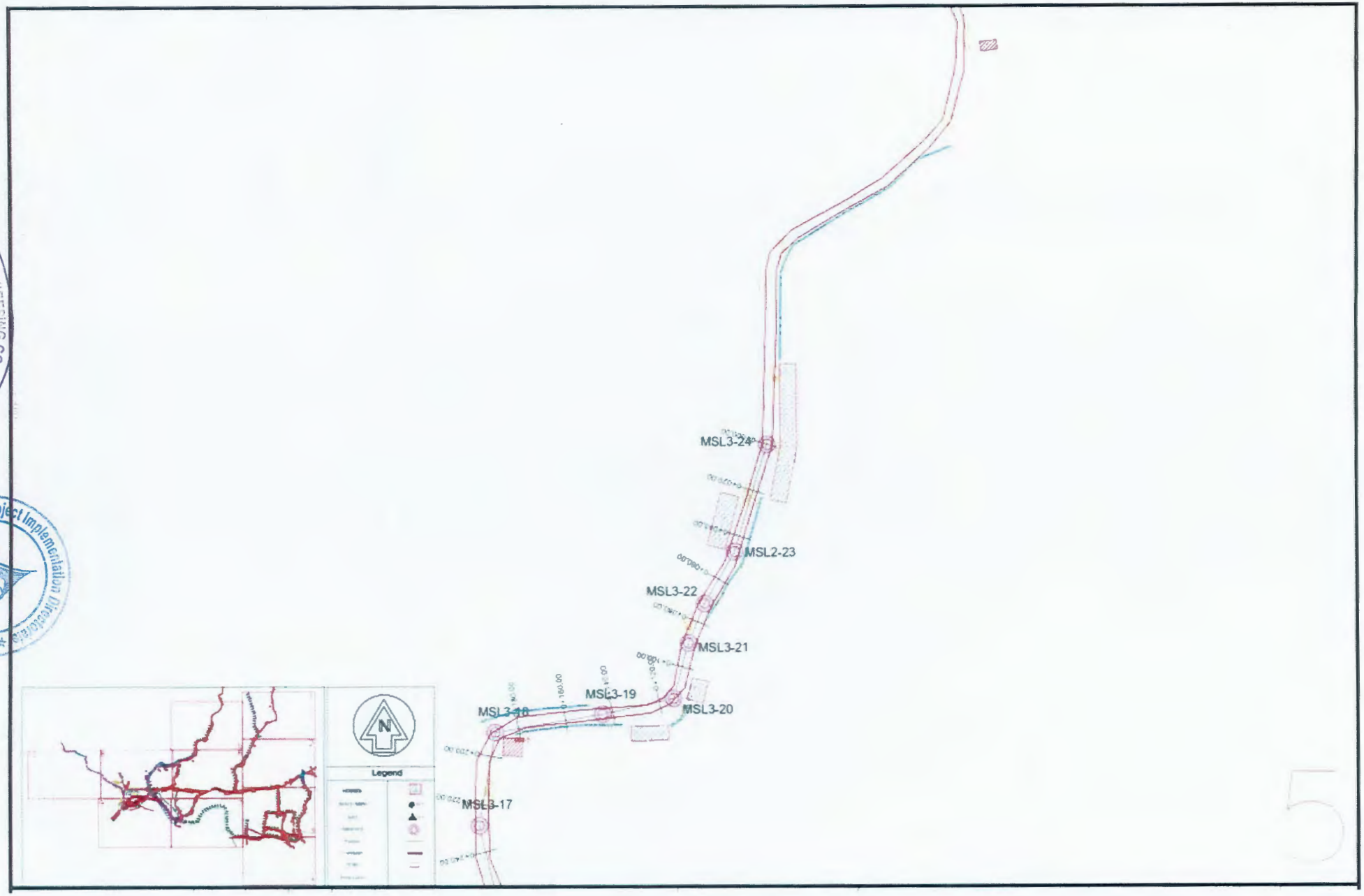

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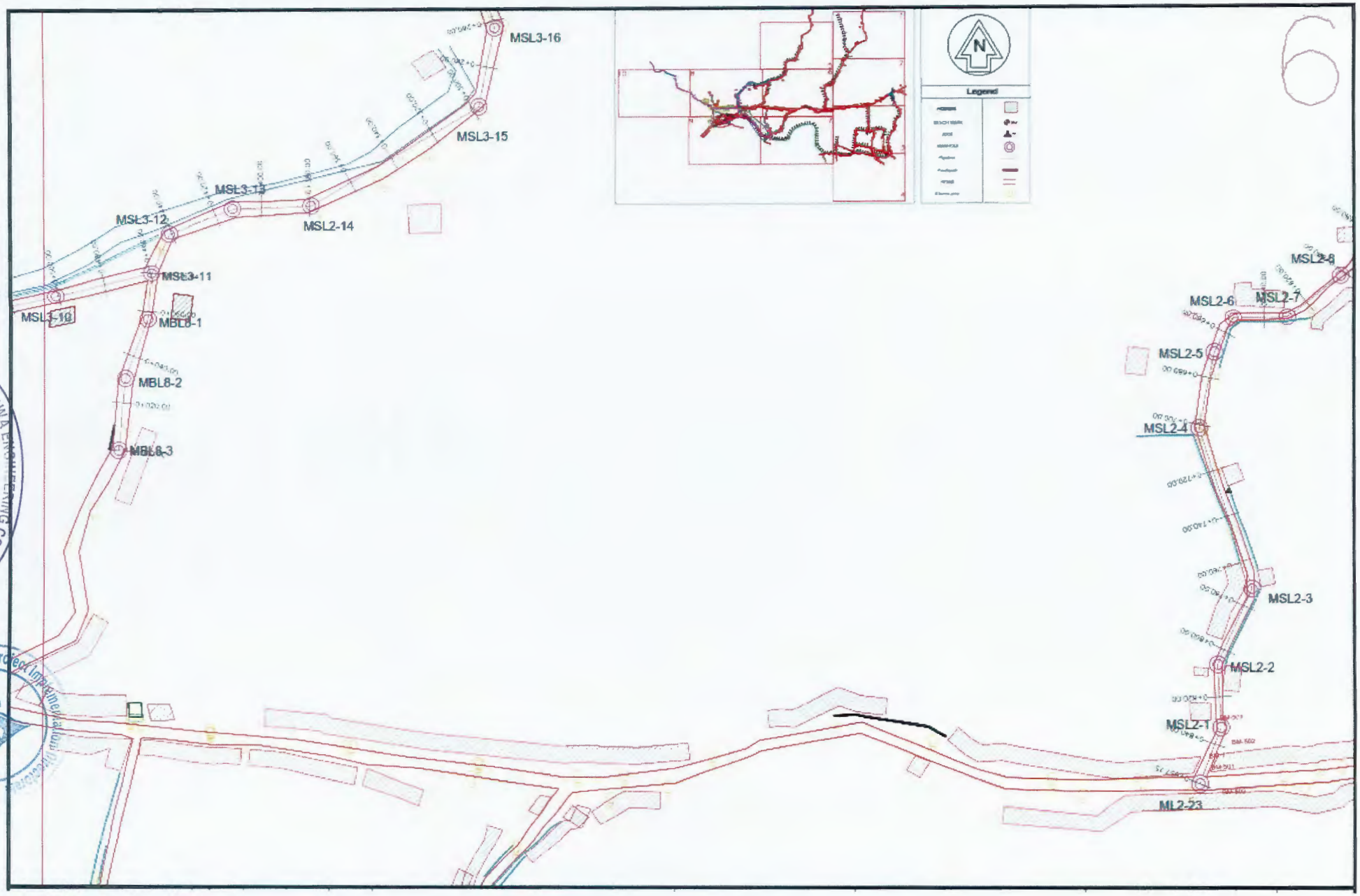
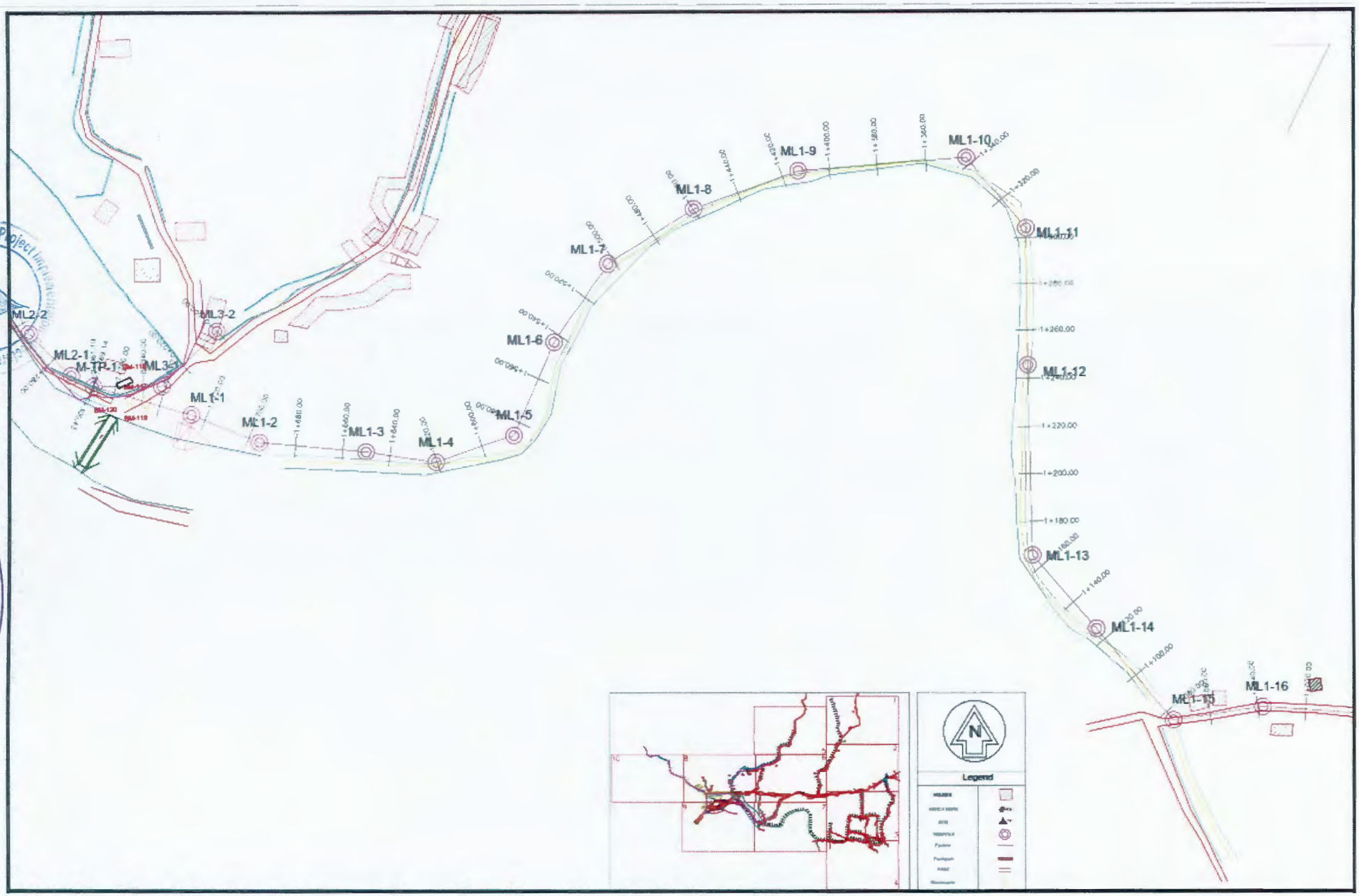
Project Implementation Directorate
Kathmandu Upatyaka Khanepani Limited
KUKL
Estd 2009

5





Kathmandu Upatyka Khanepani Limited
Project Implementation Unit
Estd 2009

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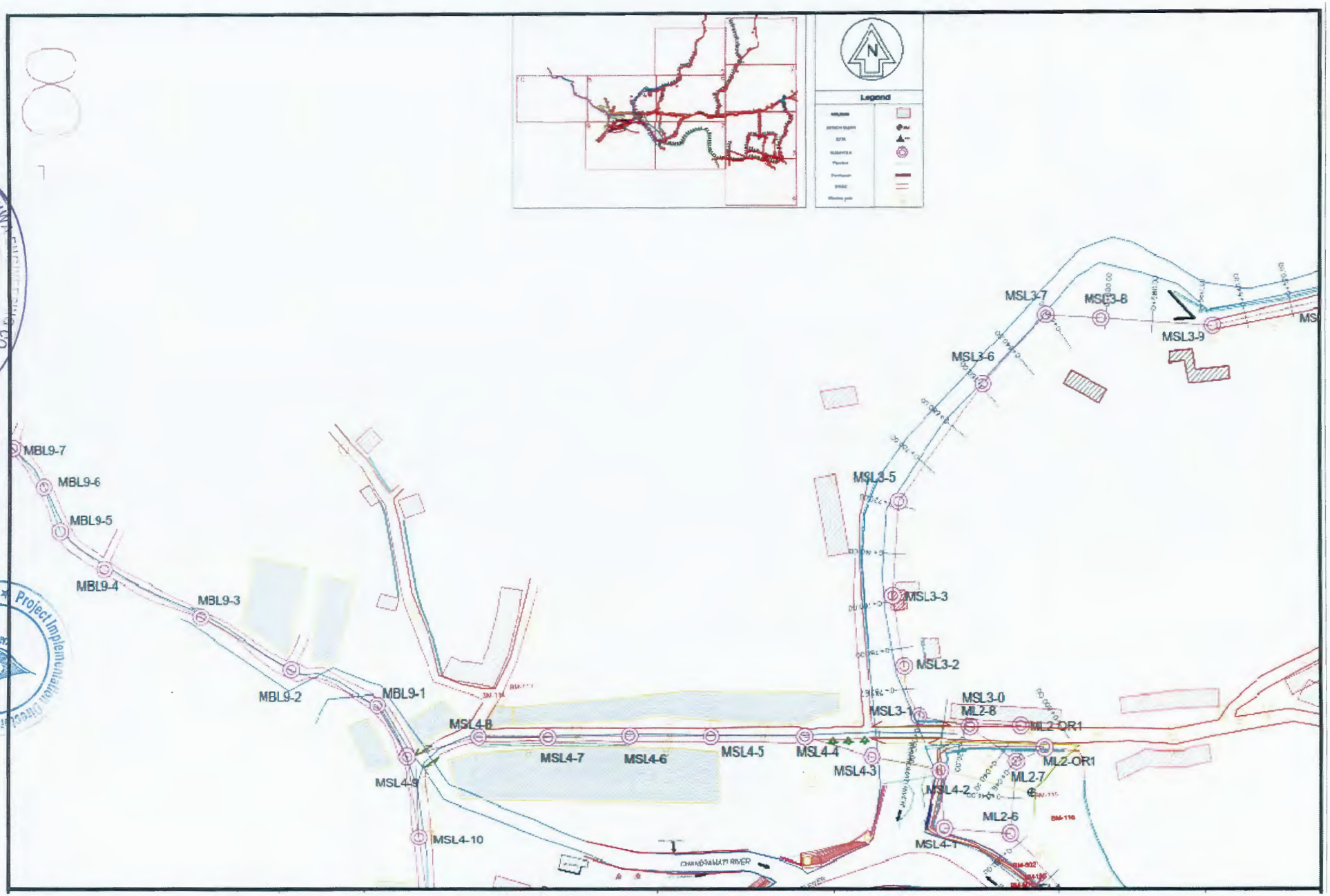
TAEC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MBL9-4
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MSL4-1
MSL4-9
MSL4-10
MSL3-7
MSL3-8
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MSL3-6
MSL3-5
MSL3-3
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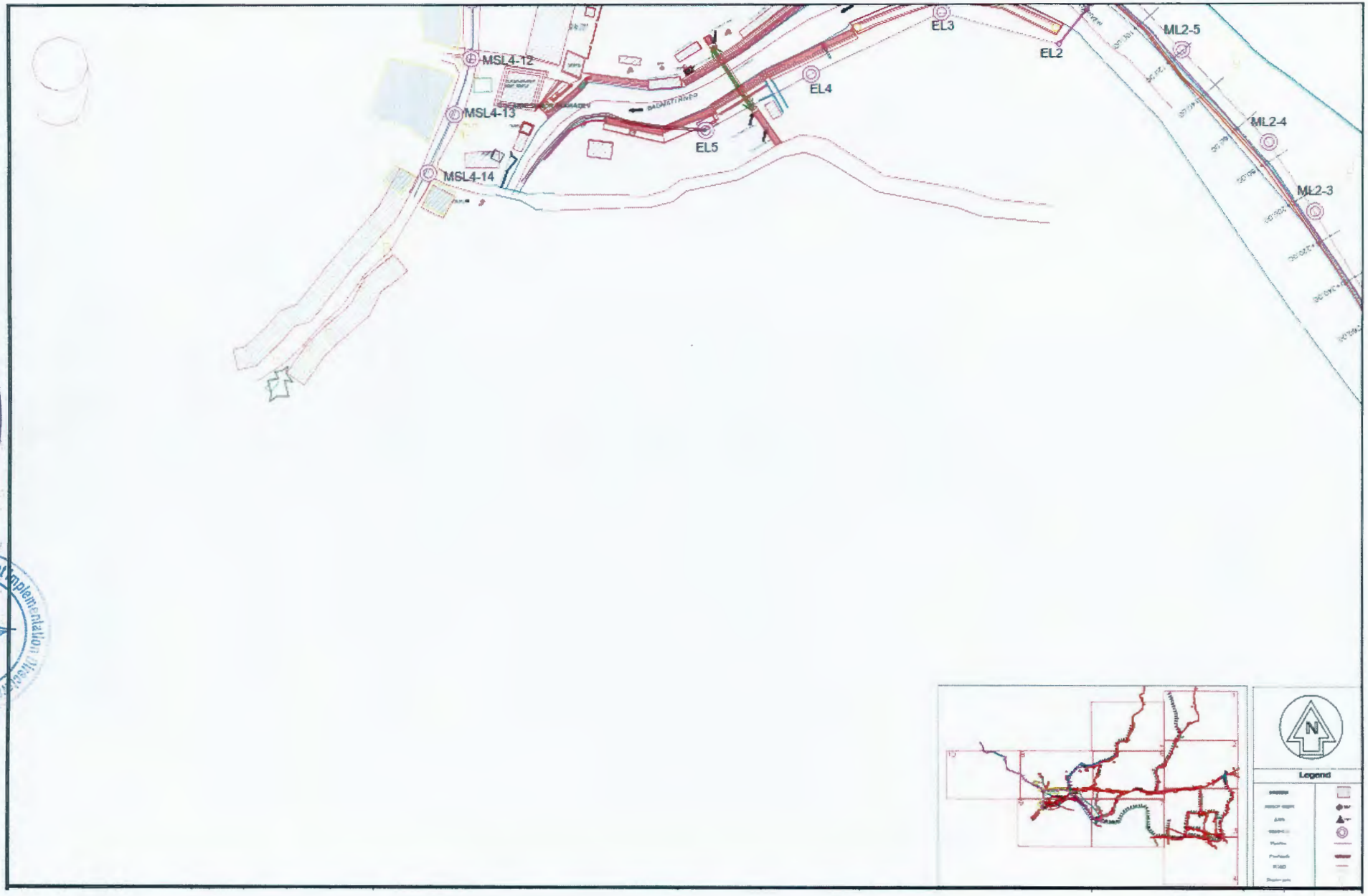
ML2-7
ML2-6
CHANDRAVATI RIVER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EL4
EL3
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ML2-3
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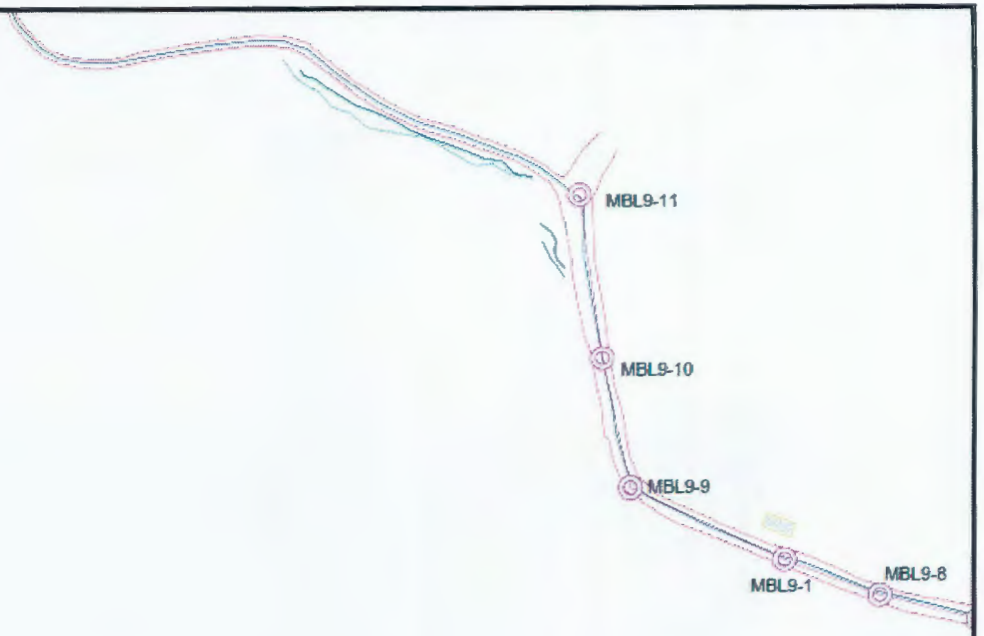
Legend

10



Appendix-III: Public Hearing Notice

हिसामुक्त घर,
सुखी परिवार ।
समृद्ध समाजको
बलियो आधार ।
नेपाल सरकार
विज्ञापन बोर्ड

हिमालय टाइम्स

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ई-पेपर हेर्नको लागि

HIMALAYA TIMES Monday 3 Jan 2022

काठमाण्डौ उपत्यका खानेपानी लिमिटेड

आयोजना कार्यान्वयन निर्देशनालय

काठमाण्डौ उपत्यका खानेपानी तथा सरसफाई आयोजना

अनामनगर, काठमाण्डौ

गोकर्ण ढल संजाल आयोजनाको संक्षिप्त वातावरणीय अध्ययनको लागि सार्वजनिक सुनुवाई गर्ने सम्बन्धी सूचना

प्रकाशित मिति : २०७८/०९/१५ गते सोमबार

बागमती प्रदेश, काठमाण्डौ जिल्ला, गोकर्णेश्वर नगरपालिका वडा नं ४ मा काठमाण्डौ उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय अन्तर्गत काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजनाद्वारा निम्न वर्मोजिमको प्रस्ताव कार्यान्वयन गर्न लागिएको छ ।

प्रस्तावकको नाम र ठेगाना	काठमाण्डौ उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय, काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजना, अनामनगर काठमाण्डौ
प्रस्तावको व्यहोरा	गोकर्ण क्षेत्रबाट ढलको पानी सङ्कलन गरी फोहोर पानी प्रशोधन केन्द्र गोकर्ण DEWATS मा पुर्याउने आयोजना
प्रभाव पर्न सक्ने जिल्ला र न।पा	गोकर्णेश्वर नगरपालिकाको वडा नं ४

उपरोक्त प्रस्तावको संक्षिप्त वातावरणीय अध्ययन (Brief Environmental Study) प्रतिवेदन तयार गर्दा वातावरण संरक्षण नियमावली २०७७ को नियम ६ वर्मोजिम सार्वजनिक सुनुवाईको आयोजना गरी राय सुझाव संकलन गर्नुपर्ने भएकोले निम्न मिति स्थान र समयमा सम्बन्धित वडा तथा त्यस क्षेत्रका स्वास्थ्य चौकी, टोल विकास संस्था आमा समूह विद्यालय अभिभावक र सरोकारवाला व्यक्ति तथा संघ संस्थाहरुले सक्रिय रुपमा सहभागि भई आफ्नो राय सुझाव दिनुहुन अनुरोध गरिन्छ ।

स्थान : गोकर्णेश्वर नगरपालिका वडा नं ४ को वडा कार्यालय

मिति : २०७८ पौष २६ गते सोमवार

समय : दिउसो १२:०० बजे

आयोजक :

काठमाण्डौ उपत्यका खानेपानी लिमिटेड

आयोजना कार्यान्वयन निर्देशनालय

काठमाण्डौ उपत्यका फोहर पानी व्यवस्थापन आयोजना

अनामनगर, काठमाण्डौ

DOHWA ENGINEERING CO., LTD.

Project Implementation Unit
Kathmandu Upatyaka Khanepani Limited
Estd 2009

Appendix-IV: Muchulka / Deed of Enquiry of Public Hearing Notice

मिति २०७८/०९/१९ गते सोमबारका दिन हिमालय टाइम्स नेपाली राष्ट्रिय दैनिकमा प्रकाशित गरिए बमोजिम निम्नानुसारको सार्वजनिक सूचना यस महानगरीय प्रहरी प्रभाग कार्यालयको सूचना पाटीमा टाँस गरिएको व्यहोरा प्रमाणित गरीन्छ ।

हिमालय टाइम्स

काठमाण्डौ उपत्यका खानेपानी लिमिटेड
आयोजना कार्यान्वयन निर्देशनालय
काठमाण्डौ उपत्यका खानेपानी तथा सरसफाई आयोजना
अनामनगर, काठमाण्डौ

गोकर्ण दस मजल आयोजनाको संक्षिप्त वातावरणीय अध्ययनको लागि सार्वजनिक सुनुवाई गर्ने सम्बन्धी सूचना

प्रकाशित मिति : २०७८/०९/१९ गते सोमबार

[illegible]

प्रस्तावकको नाम र ठेगाना	काठमाण्डौ उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय, काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजना, अनामनगर काठमाण्डौ
प्रस्तावको व्यहोरा	[illegible] (गोकर्ण DEWATS) मा पुर्याउने आयोजना
प्रभाव पर्ने क्षेत्र जिल्ला र ठाउँ	गोकर्णेश्वर नगरपालिकाको वडा नं ४

[illegible] (Brief Environmental Study) [illegible]

स्थान : गोकर्णेश्वर नगरपालिका वडा नं.४ को वडा कार्यालय
मिति : [illegible] गते, सोमबार
समय : दिउँसो १२:०० बजे
आयोजक :
काठमाण्डौ उपत्यका खानेपानी लिमिटेड
आयोजना कार्यान्वयन निर्देशनालय
काठमाण्डौ उपत्यका फोहर पानी व्यवस्थापन आयोजना
अनामनगर, काठमाण्डौ

सूचना टाँस प्रमाणित गर्ने व्यक्तिको नाम : तिलोक ठि क

मिति : २०७८/०९/२९

हस्ताक्षर :

पद पेशा :

कार्यालयको नाम : महानगरीय प्रहरी प्रभाग, गोकर्ण

कार्यालयको ठेगाना :

कार्यालयको छाप :

मिति २०७८/०९/१९ गते सोमबारका दिन हिमालय टाइम्स नेपाली राष्ट्रिय दैनिकमा प्रकाशित गरिए बमोजिम निम्नानुसारको सार्वजनिक सूचना यस श्री ओखर्पा मा.वि. कार्यालयको सूचना पाटीमा टाँस गरिएको व्यहोरा प्रमाणित गरीन्छ ।

हिमालय टाइम्स

काठमाण्डौ उपत्यका खानेपानी लिमिटेड
आयोजना कार्यान्वयन निर्देशनालय
काठमाण्डौ उपत्यका खानेपानी तथा सरसफाई आयोजना
अनामनगर, काठमाण्डौ

गोकर्ण दस मजल आयोजनाको संक्षिप्त वातावरणीय अध्ययनको लागि सार्वजनिक सुनुवाई गर्ने सम्बन्धी सूचना

प्रकाशित मिति : २०७८/०९/१९ गते सोमबार

[illegible]

प्रस्तावकको नाम र ठेगाना	काठमाण्डौ उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय, काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजना, अनामनगर काठमाण्डौ
प्रस्तावको व्यहोरा	[illegible] (गोकर्ण DEWATS) मा पुर्याउने आयोजना
प्रभाव पर्ने क्षेत्र जिल्ला र ठाउँ	गोकर्णेश्वर नगरपालिकाको वडा नं ४

[illegible] (Brief Environmental Study) [illegible]

स्थान : गोकर्णेश्वर नगरपालिका वडा नं.४ को वडा कार्यालय
मिति : [illegible] गते, सोमबार
समय : दिउँसो १२:०० बजे
आयोजक :
काठमाण्डौ उपत्यका खानेपानी लिमिटेड
आयोजना कार्यान्वयन निर्देशनालय
काठमाण्डौ उपत्यका फोहर पानी व्यवस्थापन आयोजना
अनामनगर, काठमाण्डौ

सूचना टाँस प्रमाणित गर्ने व्यक्तिको नाम : कृष्ण कुमार श्रेष्ठ

मिति : ०७८/०९/२०

हस्ताक्षर :

पद/पेशा : लेखापाल

कार्यालयको नाम : श्री ओखर्पा मा.वि.

कार्यालयको ठेगाना : गोकर्णेश्वर न.पा.-४

कार्यालयको छाप :

Project Implementation Directorate ★ Kathmandu Upatyaka Khanepani Limited ★ Estd 2006

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मिति २०७८/०९/१९ गते सोमबारका दिन हिमालय टाइम्स नेपाली राष्ट्रिय दैनिकमा प्रकाशित गरिए बमोजिम निम्नानुसारको सार्वजनिक सूचना यस गौरीकर्ण प्राथमिक अस्पताल कार्यालयको सूचना पाटीमा टाँस गरिएको व्यहोरा प्रमाणित गरिन्छ ।

काठमाण्डौ उपत्यका खानेपानी लिमिटेड
आयोजना कार्यान्वयन निर्देशनालय
काठमाण्डौ उपत्यका खानेपानी तथा सरसफाई आयोजना
अमानगंज, काठमाण्डौ

गौरकर्ण हुदै सञ्चालन आयोजनाको संक्षिप्त वातावरणीय अध्ययनको लागि सार्वजनिक सुनुवाई गर्ने सम्बन्धी सूचना

प्रकाशित मिति : २०७८/०९/१८ गते सोमबार

वागमती प्रदेश, काठमाण्डौ जिल्ला, गौरीकर्ण नगरपालिका वडा नं ४ मा काठमाण्डौ उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय अन्तर्गत काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजनाद्वारा निम्न बमोजिमको प्रस्ताव कार्यान्वयन गर्न लागिएको छ ।

प्रस्तावकको नाम र ठेगाना	काठमाण्डौ उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय, काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजना, अमानगंज काठमाण्डौ
प्रस्तावको स्थानिय	गौरकर्ण रोयलटाट डम्पको पानी सङ्कलन गर्ने फोहोर पानी प्रशोधन केन्द्र (गौरकर्ण DCWWTP) सम्म पुर्याउने सङ्कलन
प्रभाव पर्ने क्षेत्रको जिल्ला र वडा	गौरकर्णेश्वर नगरपालिकाको वडा नं ४

उपरोक्त प्रस्तावको संक्षिप्त वातावरणीय अध्ययन (Brief Environmental Study) प्रतिवेदन तयार गर्दा वातावरण संरक्षण नियमावली २०७७ को नियम १८। बमोजिम सार्वजनिक सुनुवाईको सार्वजना गर्दा साथ सुझाव सङ्कलन गर्नुपर्ने व्यहोरामा निम्न मिति, स्थान र समयमा सम्बन्धित वडा तथा स्थानीय तहका स्थानीय पदाधिकारी, टोल विकास समिति, आमा समूह, विद्यालय, अस्पताल, र सरोकारवाला व्यक्ति तथा संघ संस्थाहरुले लिखित रुपमा सहभागि भई आफ्नो राय सुझाव दिनुहुन अनुरोध गरिन्छ ।

स्थान : गौरकर्णेश्वर नगरपालिका वडा नं.४ को वडा कार्यालय
मिति : २०७८ पौष २५ गते, सोमबार
समय : दिउसो १२:०० बजे

आयोजक :
काठमाण्डौ उपत्यका खानेपानी लिमिटेड
कार्यालय कार्यान्वयन निर्देशनालय
काठमाण्डौ उपत्यका फोहर पानी व्यवस्थापन आयोजना
अमानगंज, काठमाण्डौ

सूचना टाँस प्रमाणित गर्ने व्यक्तिको नाम : शिव कुमार्ज
मिति : २०७८/१२/२०
हस्ताक्षर :
पद/पेशा : कार्यालय अपरेटर
कार्यालयको नाम : गौरकर्ण प्राथमिक अस्पताल
कार्यालयको ठेगाना : गौरकर्णेश्वर नगरपालिका, गौरकर्ण
कार्यालयको छाप :

मिति २०७८/०९/१९ गते सोमबारका दिन हिमालय टाइम्स नेपाली राष्ट्रिय दैनिकमा प्रकाशित गरिए बमोजिम निम्नानुसारको सार्वजनिक सूचना यस नेपाल मेडिकल कलेज कार्यालयको सूचना पाटीमा टाँस गरिएको व्यहोरा प्रमाणित गरिन्छ ।

काठमाण्डौ उपत्यका खानेपानी लिमिटेड
आयोजना कार्यान्वयन निर्देशनालय
काठमाण्डौ उपत्यका खानेपानी तथा सरसफाई आयोजना
अमानगंज, काठमाण्डौ

गौरकर्ण हुदै सञ्चालन आयोजनाको संक्षिप्त वातावरणीय अध्ययनको लागि सार्वजनिक सुनुवाई गर्ने सम्बन्धी सूचना

प्रकाशित मिति : २०७८/०९/१८ गते सोमबार

वागमती प्रदेश, काठमाण्डौ जिल्ला, गौरीकर्ण नगरपालिका वडा नं ४ मा काठमाण्डौ उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय अन्तर्गत काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजनाद्वारा निम्न बमोजिमको प्रस्ताव कार्यान्वयन गर्न लागिएको छ ।

प्रस्तावकको नाम र ठेगाना	काठमाण्डौ उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय, काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजना, अमानगंज काठमाण्डौ
प्रस्तावको स्थानिय	गौरकर्ण रोयलटाट डम्पको पानी सङ्कलन गर्ने फोहोर पानी प्रशोधन केन्द्र (गौरकर्ण DCWWTP) सम्म पुर्याउने सङ्कलन
प्रभाव पर्ने क्षेत्रको जिल्ला र वडा	गौरकर्णेश्वर नगरपालिकाको वडा नं ४

उपरोक्त प्रस्तावको संक्षिप्त वातावरणीय अध्ययन (Brief Environmental Study) प्रतिवेदन तयार गर्दा वातावरण संरक्षण नियमावली २०७७ को नियम १८। बमोजिम सार्वजनिक सुनुवाईको आयोजना गर्दा साथ सुझाव सङ्कलन गर्नुपर्ने व्यहोरामा निम्न मिति, स्थान र समयमा सम्बन्धित वडा तथा स्थानीय तहका स्थानीय पदाधिकारी, टोल विकास समिति, आमा समूह, विद्यालय, अस्पताल, र सरोकारवाला व्यक्ति तथा संघ संस्थाहरुले लिखित रुपमा सहभागि भई आफ्नो राय सुझाव दिनुहुन अनुरोध गरिन्छ ।

स्थान : गौरकर्णेश्वर नगरपालिका वडा नं.४ को वडा कार्यालय
मिति : २०७८ पौष २५ गते, सोमबार
समय : दिउसो १२:०० बजे

आयोजक :
काठमाण्डौ उपत्यका खानेपानी लिमिटेड
आयोजना कार्यान्वयन निर्देशनालय
काठमाण्डौ उपत्यका फोहर पानी व्यवस्थापन आयोजना
अमानगंज, काठमाण्डौ

सूचना टाँस प्रमाणित गर्ने व्यक्तिको नाम :
मिति : २०७८/०९/२०
हस्ताक्षर :
पद/पेशा : प्रशासन अधिकृत
कार्यालयको नाम : नेपाल मेडिकल कलेज
कार्यालयको ठेगाना : आदरबेल
कार्यालयको छाप :

DOHWA ENGINEERING CO., LTD. ERMC TAEC In association with

मिति २०७८/०९/१९ गते सोमवारका दिन हिमालय टाइम्स नेपाली राष्ट्रिय दैनिकमा प्रकाशित गरिए बमोजिम निम्नानुसारको सार्वजनिक सूचना यस ..... कार्यालयको सूचना पाटीमा टाँस गरीएको व्यहोरा प्रमाणित गरीन्छ ।

काठमाण्डौ उपत्यका खानेपानी लिमिटेड
आयोजना कार्यान्वयन निर्देशनालय
काठमाण्डौ उपत्यका खानेपानी तथा ढल्सफाई आयोजना
बालाजु, काठमाण्डौ

गोकर्ण ढल सञ्जाल आयोजनाको संक्षिप्त वातावरणीय अध्ययनका लागि सार्वजनिक सुनुवाई गर्ने सम्बन्धी सूचना

प्रकाशित मिति : २०७८/०९/१९ गते सोमवार

बागमती प्रदेश, काठमाण्डौ जिल्ला, गोकर्णेश्वर नगरपालिका वडा नं ४ मा काठमाण्डौ उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय अन्तर्गत काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजनाबाट निम्न बमोजिमको प्रस्ताव कार्यान्वयन गर्न लागिएको छ ।

प्रस्तावकको नाम र ठेगाना	काठमाण्डौ उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय, काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजना, बालाजु, काठमाण्डौ
प्रस्तावको संक्षिप्त	गोकर्ण क्षेत्रबाट हुनको फोहर पानी सङ्कलन गरी फोहोर पानी प्रशोधन केन्द्र (गोकर्ण DONUS) सम्म पुर्याउने आयोजना
प्रस्ताव पर्ने गाउँ जिल्ला र क्षेत्रफल	गोकर्णेश्वर नगरपालिकाको वडा नं ४

प्रस्तावित प्रस्तावको संक्षिप्त वातावरणीय अध्ययन (Brief Environmental Study) प्रतिवेदन तयार गर्दा वातावरण संरक्षण नियमावली २०७७ को नियम ८) बमोजिम सार्वजनिक सुनुवाईको आयोजना गरी साथ पुर्याउन सङ्कलन गर्नुपर्ने सम्बन्धी निम्न विषय, स्थान र समयमा सम्बन्धित वडा तथा गाउँ विकास समिति, जागा समूह, शिक्षालय, अस्पताल, र सरोकारवालाबाट व्यक्ति वा संस्था वस्तुगतको लिखित रुपमा सहभागि भई आफ्नो राय सुझाव दिनुहुन अनुरोध गरिन्छ ।

स्थान : गोकर्णेश्वर नगरपालिका वडा नं ४ को बडा कार्यालय
मिति : २०७८ पौष २६ गते, सोमवार
समय : दिउसो १२:०० बजे
आयोजक :
काठमाण्डौ उपत्यका खानेपानी लिमिटेड
आयोजना कार्यान्वयन निर्देशनालय
काठमाण्डौ उपत्यका फोहर पानी व्यवस्थापन आयोजना
बालाजु, काठमाण्डौ

सूचना टाँस प्रमाणित गर्ने व्यक्तिको नाम सुरेश भण्डारी
मिति : २०७८/०९/२०
हस्ताक्षर :
पद/पेशा सूचना प्रविधी - अधिकृत
कार्यालयको नाम : गोकर्णेश्वर नगरपालिका
कार्यालयको ठेगाना गोकर्ण
कार्यालयको छाप

मिति २०७८/०९/१९ गते सोमवारका दिन हिमालय टाइम्स नेपाली राष्ट्रिय दैनिकमा प्रकाशित गरिए बमोजिम निम्नानुसारको सार्वजनिक सूचना यस गो न पा वडा नं ४ कार्यालयको सूचना पाटीमा टाँस गरीएको व्यहोरा प्रमाणित गरीन्छ ।

काठमाण्डौ उपत्यका खानेपानी लिमिटेड
आयोजना कार्यान्वयन निर्देशनालय
काठमाण्डौ उपत्यका खानेपानी तथा ढल्सफाई आयोजना
बालाजु, काठमाण्डौ

गोकर्ण ढल सञ्जाल आयोजनाको संक्षिप्त वातावरणीय अध्ययनका लागि सार्वजनिक सुनुवाई गर्ने सम्बन्धी सूचना

प्रकाशित मिति : २०७८/०९/१९ गते सोमवार

बागमती प्रदेश, काठमाण्डौ जिल्ला, गोकर्णेश्वर नगरपालिका वडा नं ४ मा काठमाण्डौ उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय अन्तर्गत काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजनाबाट निम्न बमोजिमको प्रस्ताव कार्यान्वयन गर्न लागिएको छ ।

प्रस्तावकको नाम र ठेगाना	काठमाण्डौ उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय, काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजना, बालाजु, काठमाण्डौ
प्रस्तावको संक्षिप्त	गोकर्ण क्षेत्रबाट हुनको फोहर पानी सङ्कलन गरी फोहोर पानी प्रशोधन केन्द्र (गोकर्ण DONUS) सम्म पुर्याउने आयोजना
प्रस्ताव पर्ने गाउँ जिल्ला र क्षेत्रफल	गोकर्णेश्वर नगरपालिकाको वडा नं ४

प्रस्तावित प्रस्तावको संक्षिप्त वातावरणीय अध्ययन (Brief Environmental Study) प्रतिवेदन तयार गर्दा वातावरण संरक्षण नियमावली २०७७ को नियम ८) बमोजिम सार्वजनिक सुनुवाईको आयोजना गरी साथ पुर्याउन सङ्कलन गर्नुपर्ने सम्बन्धी निम्न विषय, स्थान र समयमा सम्बन्धित वडा तथा गाउँ विकास समिति, जागा समूह, शिक्षालय, अस्पताल, र सरोकारवालाबाट व्यक्ति वा संस्था वस्तुगतको लिखित रुपमा सहभागि भई आफ्नो राय सुझाव दिनुहुन अनुरोध गरिन्छ ।

स्थान : गोकर्णेश्वर नगरपालिका वडा नं ४ को बडा कार्यालय
मिति : २०७८ पौष २६ गते, सोमवार
समय : दिउसो १२:०० बजे
आयोजक :
काठमाण्डौ उपत्यका खानेपानी लिमिटेड
आयोजना कार्यान्वयन निर्देशनालय
काठमाण्डौ उपत्यका फोहर पानी व्यवस्थापन आयोजना
बालाजु, काठमाण्डौ

सूचना टाँस प्रमाणित गर्ने व्यक्तिको नाम रमेश भेटवाल
मिति :
हस्ताक्षर :
पद/पेशा :
कार्यालयको नाम : गो न पा वडा नं ४
कार्यालयको ठेगाना गोकर्ण
कार्यालयको छाप :

विषय: मुचुल्का

काठमाण्डौ उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय अन्तर्गत काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजनाका लागि गोकर्णेश्वर नगरपालिका वडा नं ४मा गोकर्ण क्षेत्रबाट ढलको पानी सङ्कलन गरी फोहोर पानी प्रशोधन केन्द्र (गोकर्ण DEWATS) मा पुर्याउने आयोजनाबारे (गोकर्ण ढल सजाल आयोजना) संक्षिप्त वातावरणीय अध्ययन (Brief Environmental Study) प्रतिवेदन तयार गर्नका लागि २०७८/०९/१९ गते सोमवारका दिन हिमालय टाइम्स नेपाली राष्ट्रिय दैनिकमा प्रकाशित सार्वजनिक सूचना सम्बन्धी तपसिलका व्यक्तिहरुको रोहबरमा टोल भएकोले यो मुचुल्का आजको मिति २०७८/०९/२० मा तयार गरि सहि छाप गरि दियौं ।

तपसिल :

नाम	कार्यालय	फोन नं	हस्ताक्षर
[illegible]	[illegible]		
[illegible]	[illegible]		
[illegible]	[illegible]		
[illegible]	[illegible]		
[illegible]	[illegible]		
[illegible]	[illegible]		
[illegible]	[illegible]		
[illegible]	[illegible]	9818846819	
[illegible]	[illegible]	9849598258	
[illegible]	[illegible]	9851084338	
[illegible]	[illegible]	9851161550	
[illegible]	[illegible]	9851083362	
[illegible]	[illegible]	9851992899	
[illegible]	[illegible]	9851289997	

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Kathmandu Upatyaka Khanepani Limited ★ Project Implementation Directorate ★ Estd 2009

Appendix-V: Minute and Comments Received during Public Hearing

आज मिति २०७८ साल पौष २६ गते तदनुसार १० January 2022 का दिन काठमाण्डौं उपत्यका खानेपानी लिमिटेड आयोजना कार्यान्वयन निर्देशनालय अन्तर्गत काठमाण्डौं उपत्यका फोहरपानी व्यवस्थापन आयोजनाका लागि गोकर्णेश्वर नगरपालिका वडा नं ४ मा गोकर्ण ढल संजाल आयोजनाको संक्षिप्त वातावरणीय अध्ययन (Brief Environmental Study) प्रतिवेदन तयार गर्नका लागि निम्न उपस्थितिमा सार्वजनिक सुनुवाई (Public Hearing) गरियो ।

उपस्थिति

क्र.स.	नाम / थर	ठेगाना	हस्ताक्षर
१.	[illegible] श्रेष्ठ	गोकर्णेश्वर-४	
२.	सहदेव थापा	"	
३.	श्याम कुमार [illegible]	"	
४.	[illegible]	"	
५.	राजु तामाङ		
६.	गोविन्द श्रेष्ठ	गोकर्णेश्वर-४	
७.	[illegible] श्रेष्ठ	"	
८.	चन्द्रा शाह ठकुरी	"	
९.	[illegible]	"	
१०.	[illegible]	गोकर्ण स्वर ४	
११.	अनन्त [illegible] (वडा [illegible])		
१२.	[illegible] कु. [illegible]		
१३.	[illegible]	वडा कार्यालय	
१४.	[illegible]		
१५.	राज कुमार श्रेष्ठ		
१६.	कमल [illegible] गोकर्णेश्वर युवा उपकार क्लब अध्यक्ष		
१७.	कमल बहादुर [illegible]		
१८.	[illegible]	गोकर्णेश्वर-४	

क्र.सं.	नाम / थर	ठेगाना	हस्ताक्षर
१९.	शिव श्रेष्ठ	गोकर्ण ६	
२०.	राम प्रसाद श्रेष्ठ	गोकर्ण [illegible]	
२१.	निरुता [illegible]	गोकर्णेश्वर-४	
२२.	मिना [illegible]	"	
२३.	गोविन्द श्रेष्ठ	"	
२४.	[illegible]	"	
२५.	[illegible]		
२६.	[illegible] प्रसाद [illegible]	"	
२७.	[illegible]	"	
२८.	[illegible] श्रेष्ठ	"	
२९.	[illegible] श्रेष्ठ	"	
३०.	[illegible] प्र. अधिकारी	PID/DSC-6	
३१.	[illegible]	DSC/UP	
३२.	स्तुति शाक्य	PID/Env off.	
३३.	संगीताउज्वल कोइराला	PID/En.	
३४.	चन्द्र कुमार [illegible]	PID/Proj. manager	
३५.	सारीका घराना	DSC-06/EE	
३६.	[illegible]	DSC-06/Env. Engineer	
३७.	[illegible]	DSC-06	

DOHWA ENGINEERING CO., LTD. ... in association with ... TAEC

Project Implementation Directorate ★ Kathmandu Upatyaka Khanepani Limited ★ Estd 2009

काठमाण्डौं उपत्यका खानेपानी लिमिटेड आयोजना कार्यान्वयन निर्देशनालय अन्तर्गत काठमाण्डौं उपत्यका फोहर पानी व्यवस्थापन आयोजनाका लागि गोकर्णेश्वर नगरपालिका वडा नं ८ मा निर्माण हुने गोकर्ण ढल संजाल आयोजनाको संक्षिप्त वातावरणीय अध्ययन (Brief Environmental Study) प्रतिवेदन तयार गर्नका लागि उक्त ढल संजालको बारेमा जानकारि दिन गरिएको सार्वजनिक सुनुवाईमा (Public Hearing) निम्न अनुसारको राय सुझाव संकलन गरियो।

	नाम	राय / सुझाव
१.	[illegible] गोकर्णेश्वर न.पा.-८ [illegible]	(१) प्रशोधन गरि छोड्ने पानी [illegible] अगाडी [illegible] जमिन [illegible] लानु पर्ने। (२) प्रशोधन केन्द्र निर्माण भएपछि व्यवस्थित संचालन दिर्घकाल सम्म रहने गरि व्यवस्थापन पक्ष बलियो हुनुपर्ने। (३) ठेकेदार ~~[illegible]~~ को काम सम्पादन गर्दा कामको निरिक्षण कमिटि स्थानिय नागरिक बाट तयार हुनुपर्ने।
२.	[illegible] गोकर्णेश्वर न.पा.-८ [illegible]	प्रशोधित पानि खोला बाट [illegible] गरी [illegible] पर्ने। दुर्गन्धित वातावरण रहित हुनु पर्ने।
३.	कमल [illegible] [illegible]	आन्तरिक स्रोत [illegible] [illegible]
४.	[signature]	प्रशोधित पानी अन्डर ग्राउन्ड बाट पुरानो नदी सम्म लगेर खसाल्नु पर्ने
५.	विष्णु सुनाम	ढलको पाइप दुई पटि नै आदि सकेको छ। तर सडक लाइन र अरु सबै घरले वर्षातको पानी सबै त्यहि पानी मिसाइन्छ। त्यसैले अब त्यो पाइपले धान्दैन। पहिले सबैको घरमा Septic tank हुन्थ्यो तर बाटो बने पछि सरकारले मुआब्जा दिएन र जग्गा नभएपछि Septic tank घर भित्र बनाउन नसकेपछि सबैले त्यही ढलको पाइप मिसाइदियो।
६.	विदुर कुमार थापा	प्राइभेट जग्गा पर्छ कि पर्दैन, स्वीकृति पहिलै लिएर काम गर्नु होला। केलमतिमा आएको Sand washing ले खोला धेरै कोहोर भइ रहेको छ। त्यसलाई पनि केही गर्न सकिन्छ कि।
७.	शिव प्रसाद शर्मा गोकर्ण - ८	गोकर्ण मन्दिर छेउबाट बग्ने चन्द्रमति खोला किनारमा ढल संजाल निर्माण गरि प्लान्ट निर्माण हुने ढल प्रशोधन केन्द्रसम्म पुर्याउने व्यवस्थापन गरी दिनु होला।

Appendix-VI: Public Notice

A public notice of 7 days was published in Hinalaya Times, a national daily newspaper on 2078/10/24 B.S (7 February 2022 A.D) to collect feedbacks and suggestion of public people and other stakeholders


हिमालय टाइम्स

HIMALAYA TIMES Monday 7 Feb, 2022

काठमाण्डौ उपत्यका खानेपानी लिमिटेड
आयोजना कार्यान्वयन निर्देशनालय
काठमाण्डौ उपत्यका खानेपानी तथा सरसफाई आयोजना
अनामनगर, काठमाण्डौ

गोकर्ण ढल संजाल आयोजनाको संक्षिप्त वातावरणीय अध्ययनको लागि राय सुझाव पेश गर्ने सम्बन्धी सूचना

प्रकाशित मिति : २०७८/१०/२४ गते सोमबार

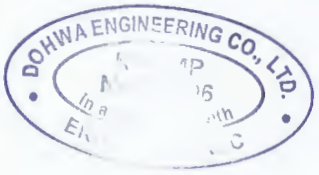
बागमती प्रदेश, काठमाण्डौ जिल्ला, गोकर्णेश्वर नगरपालिका वडा नं ४ मा काठमाण्डौ उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय अन्तर्गत काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजनाद्वारा निम्न बमोजिमको प्रस्ताव कार्यान्वयन गर्न लागिएको छ।

प्रस्तावकको नाम र ठेगाना	काठमाण्डौ उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय, काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजना, अनामनगर काठमाण्डौ
प्रस्तावको व्यहोरा	गोकर्ण क्षेत्रबाट ढलको पानी सङ्कलन गरी फोहोर पानी प्रशोधन केन्द्र (गोकर्ण DEWATS) मा पर्याउने आयोजना
प्रभाव पर्ने सक्ने जिल्ला/न.पा	गोकर्णेश्वर नगरपालिकाको वडा नं ४

उपरोक्त प्रस्तावको संक्षिप्त वातावरणीय अध्ययन (Brief Environmental Study) प्रतिवेदन तयार गर्ने क्रममा सो क्षेत्रको भौतिक, जैविक, सांस्कृतिक, सामाजिक एवं आर्थिक प्रणालीहरुमा के कस्तो प्रभाव पर्दछ भनि पहिचान गर्न प्रस्ताव कार्यान्वयन हुने स्थानीय तह तथा त्यस क्षेत्रका विद्यालय, अस्पताल, स्वास्थ्य चौकी तथा सरोकारवाला व्यक्ति वा संस्थाको लिखित राय सुझाव लिन आवश्यक भएकोले यो सार्वजनिक सूचना प्रकाशित भएको मितिले ७ (सात) दिनभित्र निम्न ठेगानामा आईपुग्ने गरी लिखित राय सुझाव उपलब्ध गराई दिनुहुन अनुरोध गरिन्छ।

राय सुझावका लागी पत्राचार गर्ने ठेगाना:

प्रस्तावकको नाम र ठेगाना	काठमाण्डौ उपत्यका खानेपानी लिमिटेड आयोजना कार्यान्वयन निर्देशनालय काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजना अनामनगर, काठमाण्डौ। फोन नं ०१-५७०५९१६/०१-५७०५१४८ फ्याक्स नं.०१-५७०५०५७ इमेल: pidmail@kuklpid.org.np
परामर्शदाताको नाम र ठेगाना	ERMC/TAEC को सहकार्यमा DOHWA इन्जिनियरिङ्ग को. लिमिटेड अनामनगर, काठमाण्डौ फोन नं ०१५७०५८८४ इमेल: dohwa2018@gmail.com



Appendix-VII: Muchulka / Deed of Enquiry of Public Notice

मिति २०७८/१०/२४ गते सोमबारका दिन हिमालय टाइम्स नेपाली राष्ट्रिय दैनिकमा प्रकाशित गरीए बमोजिम निम्नानुसारको सार्वजनिक सुचना यस ....गौकर्ण न. पा. वडा नं ४.... कार्यालयको सुचना पाटीमा टाँस गरिएको व्यहोरा प्रमाणित गरीन्छ ।

काठमाण्डौं उपत्यका खानेपानी लिमिटेड
आयोजना कार्यान्वयन निर्देशनालय
काठमाण्डौ उपत्यका खानेपानी तथा सरसफाई आयोजना
अनामनगर, काठमाण्डौ

गोकर्ण ढल संजाल आयोजनाको संक्षिप्त वातावरणीय अध्ययनको लागि राय सुझाव पेश गर्ने सम्बन्धी सुचना

प्रकाशित मिति : २०७८/१०/२४ गते सोमबार

[illegible]

प्रस्तावकको नाम र ठेगाना	[illegible]
प्रस्तावको व्यहोरा	[illegible] DEWATS [illegible]
प्रभाव पर्ने सक्ने जिल्ला/न.पा	[illegible]

[illegible] (Brief Environmental Study) [illegible]

राय सुझावका लागि पत्राचार गर्ने ठेगाना:

प्रस्तावकको नाम र ठेगाना	काठमाण्डौ उपत्यका खानेपानी लिमिटेड आयोजना कार्यान्वयन निर्देशनालय [illegible] अनामनगर, काठमाण्डौ । [illegible] ईमेल: [illegible]
परामर्शदाताको नाम र ठेगाना	ERMC/TAEC को संयुक्तमा DOHWA इन्जिनियरिङ को. लिमिटेड अनामनगर, काठमाण्डौ फोन नं [illegible] ईमेल: [illegible]@gmail.com

सुचना टाँस प्रमाणित गर्ने व्यक्तिको नाम : रमा श्रेष्ठ

मिति : २०७८/१०/२४

हस्ताक्षर : [signature]

पद/पेशा : का. सहायक पाँचौं

कार्यालयको नाम : गौ. न. पा. ४

कार्यालयको ठेगाना : गोकर्ण

कार्यालयको छाप :

मिति २०७८/१०/२४ गते सोमबारका दिन हिमालय टाइम्स नेपाली राष्ट्रिय दैनिकमा प्रकाशित गरीए बमोजिम निम्नानुसारको सार्वजनिक सुचना यस ....गोकर्णेश्वर न. पा. .... कार्यालयको सुचना पाटीमा टाँस गरीएको व्यहोरा प्रमाणित गरीन्छ ।

काठमाण्डौ उपत्यका खानेपानी लिमिटेड
आयोजना कार्यान्वयन निर्देशनालय
काठमाण्डौ उपत्यका खानेपानी तथा सरसफाई आयोजना
अनामनगर, काठमाण्डौ

गोकर्ण ढल संजाल आयोजनाको संक्षिप्त वातावरणीय अध्ययनको लागि राय सुझाव पेश गर्ने सम्बन्धी सुचना

प्रकाशित मिति : २०७८/१०/२४ गते सोमबार

[illegible]

प्रस्तावकको नाम र ठेगाना	[illegible]
प्रस्तावको व्यहोरा	[illegible] DEWATS [illegible]
प्रभाव पर्ने सक्ने जिल्ला/न.पा	[illegible]

[illegible] (Brief Environmental Study) [illegible]

राय सुझावका लागि पत्राचार गर्ने ठेगाना:

प्रस्तावकको नाम र ठेगाना	काठमाण्डौ उपत्यका खानेपानी लिमिटेड आयोजना कार्यान्वयन निर्देशनालय [illegible] अनामनगर, काठमाण्डौ । [illegible] ईमेल: [illegible]
परामर्शदाताको नाम र ठेगाना	ERMC/TAEC को संयुक्तमा DOHWA इन्जिनियरिङ को. लिमिटेड अनामनगर, काठमाण्डौ फोन नं [illegible] ईमेल: dohwa2018@gmail.com

सुचना टाँस प्रमाणित गर्ने व्यक्तिको नाम : कुन्सा श्रेष्ठ

मिति : २०७८/१०/२४

हस्ताक्षर : [signature]

पद/पेशा : सुचना प्रविधि अधिकृत

कार्यालयको नाम : गोकर्णेश्वर न. पा.

कार्यालयको ठेगाना : नेलेगाउँ, जोरपाटी

कार्यालयको छाप :

DOHWA ENGINEERING CO., LTD. KVWMP N[illegible]SC06 in association with ERME • TAEC

Kathmandu Upatyaka Khanepani Limited Estd 2009

मिति २०७८/१०/२४ गते सोमबारका दिन हिमालय टाइम्स नेपाली राष्ट्रिय दैनिकमा प्रकाशित गरीए बमोजिम निम्नानुसारको सार्वजनिक सूचना यस ....गोकर्ण प्राथमिक अस्पताल.... कार्यालयको सूचना पाटीमा टाँस गरीएको व्यहोरा प्रमाणित गरीन्छ।

काठमाण्डौं उपत्यका खानेपानी लिमिटेड
आयोजना कार्यान्वयन निर्देशनालय
काठमाण्डौं उपत्यका खानेपानी तथा सरसफाई आयोजना
अनामनगर, काठमाण्डौं

गोकर्ण ढल संजाल आयोजनाको संक्षिप्त वातावरणीय अध्ययनको लागि राय सुझाव पेश गर्ने सम्बन्धी सूचना

प्रकाशित मिति : २०७८/१०/२४ गते सोमबार

बागमती प्रदेश, काठमाण्डौं जिल्ला, गोकर्णेश्वर नगरपालिका वडा नं ४ मा काठमाण्डौं उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय अन्तर्गत काठमाण्डौं उपत्यका फोहरपानी व्यवस्थापन आयोजनाद्वारा [illegible] प्रस्ताव कार्यान्वयन गर्न लागिएको छ।

प्रस्तावकको नाम र ठेगाना	काठमाण्डौं उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय, काठमाण्डौं उपत्यका फोहरपानी व्यवस्थापन आयोजना, अनामनगर काठमाण्डौं
प्रस्तावको व्यहोरा	[illegible] (DEWATS) मा [illegible]
प्रभाव पर्ने सक्ने जिल्ला/न.पा	गोकर्णेश्वर नगरपालिकाको वडा नं ४

उपरोक्त प्रस्तावको संक्षिप्त वातावरणीय अध्ययन (Brief Environmental Study) प्रतिवेदन तयार गर्ने क्रममा सो क्षेत्रको भौतिक, जैविक, सांस्कृतिक, सामाजिक एवं आर्थिक पक्षहरूमा के कस्तो प्रभाव पर्दछ [illegible] विद्यालय, अस्पताल, [illegible] सूचना प्रकाशित भएको मितिले ७ (सात) दिनभित्र निम्न ठेगानामा [illegible] राय सुझाव उपलब्ध गराई दिनुहुन अनुरोध गरिन्छ।

राय सुझावका लागि पत्राचार गर्ने ठेगाना:

प्रस्तावकको नाम र ठेगाना	काठमाण्डौं उपत्यका खानेपानी लिमिटेड आयोजना कार्यान्वयन निर्देशनालय काठमाण्डौं उपत्यका फोहरपानी व्यवस्थापन आयोजना अनामनगर, काठमाण्डौं। फोन नं. [illegible] फ्याक्स नं. [illegible] ईमेल: [illegible]@kuklpid.org.np
परामर्शदाताको नाम र ठेगाना	ERMC/TAEC को सहकार्यमा DOHWA ईन्जिनियरिङ कं. लिमिटेड अनामनगर, काठमाण्डौं फोन नं. [illegible] ईमेल: dohwa2018@gmail.com

सूचना टाँस प्रमाणित गर्ने व्यक्तिको नाम : मिरा गुभाजु

मिति : २०७८/१०/२५

हस्ताक्षर : (signature)

पद/पेशा : कम्प्युटर अपरेटर

कार्यालयको नाम : गोकर्णेश्वर नगर अस्पताल

कार्यालयको ठेगाना : गोकर्णेश्वर -४

कार्यालयको छाप : (stamp: गोकर्णेश्वर नगरपालिका, गोकर्ण प्राथमिक अस्पताल, गोकर्णेश्वर वडा नं. ४, काठमाडौं, बागमती प्रदेश, नेपाल)

मिति २०७८/१०/२४ गते सोमबारका दिन हिमालय टाइम्स नेपाली राष्ट्रिय दैनिकमा प्रकाशित गरीए बमोजिम निम्नानुसारको सार्वजनिक सूचना यस ....गोकर्ण प्रहरी प्रभाग.... कार्यालयको सूचना पाटीमा टाँस गरीएको व्यहोरा प्रमाणित गरीन्छ।

काठमाण्डौं उपत्यका खानेपानी लिमिटेड
आयोजना कार्यान्वयन निर्देशनालय
काठमाण्डौं उपत्यका खानेपानी तथा सरसफाई आयोजना
अनामनगर, काठमाण्डौं

गोकर्ण ढल संजाल आयोजनाको संक्षिप्त वातावरणीय अध्ययनको लागि राय सुझाव पेश गर्ने सम्बन्धी सूचना

प्रकाशित मिति : २०७८/१०/२४ गते सोमबार

[illegible]

सूचना टाँस प्रमाणित गर्ने व्यक्तिको नाम : दिव्या स्याङ्क

मिति : २०७८/१०/२५ गते

हस्ताक्षर : (signature)

पद/पेशा : प्रहरी जवान

कार्यालयको नाम : गोकर्ण प्रहरी प्रभाग

कार्यालयको ठेगाना : का.जि. गो.न.पा. [illegible] -४

कार्यालयको छाप : (stamp: नेपाल प्रहरी ... गोकर्ण)

मिति २०७८/१०/२४ गते सोमबारका दिन हिमालय टाइम्स नेपाली राष्ट्रिय दैनिकमा प्रकाशित गरिए बमोजिम निम्नानुसारको सार्वजनिक सूचना यस सहयोगी मा विद्यालय कार्यालयको सूचना पाटीमा टाँस गरिएको व्यहोरा प्रमाणित गरिन्छ।

काठमाण्डौ उपत्यका खानेपानी लिमिटेड
आयोजना कार्यान्वयन निर्देशनालय
काठमाण्डौ उपत्यका खानेपानी तथा सरसफाई आयोजना
अनामनगर, काठमाण्डौ

गोकर्ण ढल संजाल आयोजनाको संक्षिप्त वातावरणीय अध्ययनको लागि राय सुझाव पेश गर्ने सम्बन्धी सूचना

प्रकाशित मिति : २०७८/१०/२४ गते सोमबार

[illegible]

प्रस्तावकको नाम र ठेगाना	[illegible]
प्रस्तावको व्यहोरा	[illegible] DEWATS [illegible]
सुझाव गर्ने सकिने जिल्ला/न.पा.	[illegible]

[illegible] (Brief Environmental Study) [illegible]

राय सुझावका लागि पत्राचार गर्ने ठेगाना:

प्रस्तावकको नाम र ठेगाना	काठमाण्डौ उपत्यका खानेपानी लिमिटेड आयोजना कार्यान्वयन निर्देशनालय काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजना अनामनगर, काठमाण्डौ। फोन नं. [illegible] ईमेल: pidmail@kuklpid.org.np
परामर्शदाताको नाम र ठेगाना	ERMC/TAEC को सहकार्यमा DOHWA ईन्जिनियरिङ को लिमिटेड अनामनगर, काठमाण्डौ फोन नं. [illegible] ईमेल: dohwa2018@gmail.com

सूचना टाँस प्रमाणित गर्ने व्यक्तिको नाम :

मिति : २०७८/१०/२४

हस्ताक्षर : [signature]

पद/पेशा : शिक्षक

कार्यालयको नाम : सहयोगी मा वि

कार्यालयको ठेगाना : गो न पा - ४

कार्यालयको छाप :

मिति २०७८/१०/२४ गते सोमबारका दिन हिमालय टाइम्स नेपाली राष्ट्रिय दैनिकमा प्रकाशित गरिए बमोजिम निम्नानुसारको सार्वजनिक सूचना यस शान्ति टिप कार्पेट कार्यालयको सूचना पाटीमा टाँस गरिएको व्यहोरा प्रमाणित गरिन्छ।

काठमाण्डौ उपत्यका खानेपानी लिमिटेड
आयोजना कार्यान्वयन निर्देशनालय
काठमाण्डौ उपत्यका खानेपानी तथा सरसफाई आयोजना
अनामनगर, काठमाण्डौ

गोकर्ण ढल संजाल आयोजनाको संक्षिप्त वातावरणीय अध्ययनको लागि राय सुझाव पेश गर्ने सम्बन्धी सूचना

प्रकाशित मिति : २०७८/१०/२४ गते सोमबार

[illegible]

प्रस्तावकको नाम र ठेगाना	[illegible]
प्रस्तावको व्यहोरा	[illegible] DEWATS [illegible]
प्रभाव पर्ने सक्ने जिल्ला/न.पा.	[illegible]

[illegible] (Brief Environmental Study) [illegible]

राय सुझावका लागि पत्राचार गर्ने ठेगाना:

प्रस्तावकको नाम र ठेगाना	काठमाण्डौ उपत्यका खानेपानी लिमिटेड आयोजना कार्यान्वयन निर्देशनालय काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजना अनामनगर, काठमाण्डौ। फोन नं. [illegible] ईमेल: pidmail@kuklpid.org.np
परामर्शदाताको नाम र ठेगाना	ERMC/TAEC को सहकार्यमा DOHWA ईन्जिनियरिङ को लिमिटेड अनामनगर, काठमाण्डौ फोन नं. [illegible] ईमेल: dohwa2018@gmail.com

सूचना टाँस प्रमाणित गर्ने व्यक्तिको नाम : मनोज कुमार थापा क्षेत्री

मिति : २०७८/१०/२४

हस्ताक्षर : [signature]

पद/पेशा : [illegible]

कार्यालयको नाम : शान्ति टिप कार्पेट इन्डस्ट्रीज

कार्यालयको ठेगाना : गोकर्ण [illegible]

कार्यालयको छाप :

DOHWA ENGINEERING CO., LTD. In association with ERMC • TAEC

Project Implementation Directorate ★ Kathmandu Upatyaka Khanepani Limited ★ Estd 2009

विषय: मुचुल्का

काठमाण्डौ उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय अन्तर्गत काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजनाका लागि गोकर्णेश्वर नगरपालिका वडा नं ४मा गोकर्ण क्षेत्रबाट ढलको पानी सङ्कलन गरी फोहोर पानी प्रशोधन केन्द्र (गोकर्ण DEWATS) मा पुर्याउने आयोजनाको (गोकर्ण ढल संजाल आयोजना) संक्षिप्त वातावरणीय अध्ययन (Brief Environmental Study) प्रतिवेदन तयार गर्नका लागि २०७८/१०/२४ गते सोमबारका दिन हिमालय टाइम्स नेपाली राष्ट्रिय दैनिकमा प्रकाशित सार्वजनिक सुचना हामी तपसिलका व्यक्तिहरुको रोहवरमा टाँस भएकोले यो मुचुल्का आजको मिति २०७८/१०/२५ मा तयार गरि सहि छाप गरि दियौं।

तपसिल :

नाम	कार्यालय	फोन नं.	हस्ताक्षर
रमा श्रेष्ठ	गो. न. पा. ४	9842746608	
प्रेम कुमारी कार्की	,, ,,	९८६०८८६८३८	
विशाल खतिवडा	,, ,,	९८४३२२८८६२	
कृष्ण न्यौपाने	सहयोगी म्या० वि०	9841472311	
शिव गुरुङ	गोकर्ण नगर अस्पताल	9841075683	
[illegible]	,, ,,		
उद्धव [illegible]	[illegible]	9841490840	
[illegible]	[illegible]	9860604164	
पुर्णा [illegible]	[illegible]	9818876819	
Lobsang Tsering		9818599193	
Kiran Shrestha	Gokarna Mart	9851129953	
[illegible]	[illegible]	9851289997	
[illegible]	गोकर्णेश्वर [illegible]	98[illegible]115	

★ Project Implementation Directorate ★ Kathmandu Upatyaka Khanepani Limited
KATHMANDU WATER
Estd 2009

DOHWA ENGINEERING CO., LTD.
KV[illegible]P
No. DSC06
In association with
ERMC • TAEC

Appendix-VIII: Recommendation Letter

गोकर्णेश्वर नगरपालिका
.....वडा कार्यालय
.....काठमाडौं

पत्र संख्या ०७८।०७३
चलानी नं. २२६४

मिति : २०७८/११/०६

श्री काठमाण्डौ उपत्यका खानेपानी लिमिटेड,
आयोजना कार्यान्वयन निर्देशनालय,
अनामनगर, काठमाण्डौ ।

विषयःराय सुझाव सहित सिफारिस गरिएको बारे ।

प्रस्तुत विषयमा काठमाण्डौ उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय अन्तर्गत काठमाण्डौ उपत्यका फोहरपानी व्यवस्थापन आयोजनाका लागि गोकर्णेश्वर नगरपालिका वडा नं ४ मा गोकर्ण ढल संजाल आयोजनाको प्रस्ताव गरिएको छ उक्त आयोजनाको बारेमा मिति २०७८/०९/२६ गते सार्वजनिक सुनुवाई गरिएको र मिति २०७८/१०/२४ गते नेपाली राष्ट्रिय दैनिक, हिमालय टाइम्समा प्रकाशित गरीएको संक्षिप्त वातावरणीय अध्ययनको लागि राय सुझाव पेश गर्ने सम्बन्धि सार्वजनिक सूचना यस कार्यालयको सूचना पाटीमा टाँस गरिएको कुरा अवगत भयो उक्त आयोजनाको निर्माण गर्दा भौतिक, जैविक, रासायनिक, सांस्कृतिक, आर्थिक तथा सामाजिक वातावरणमा पर्न जाने सकारात्मक प्रभावहरुको बढोत्तरी तथा नकारात्मक प्रभावहरुको न्यूनिकरण गरी कार्य गर्न सिफारिसका साथ अनुरोध गरिन्छ ।

वडा अध्यक्ष
गोकर्णेश्वर नगरपालिका, वडा नं. ४

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Appendix-IX: Minutes (Public Consultation, Focal Group Discussion)

Minutes of Meeting of public consultation at Gokarneshwor ward no 4

आज मिति 2066 चैत्र १९ गते तदनुसार 2011 April 1 शुक्रबार दिन काठमाडौं उपत्यका खानेपानी लिमिटेड, आयोजना कार्यान्वयन निर्देशनालय द्वारा काठमाडौं उपत्यका फोहोर पानी व्यवस्थापन आयोजना अन्तर्गत निर्माण गर्न लागेको Gokarna DEWATS तथा हल संचालन को लागी गोकर्ण नगरपालिका वडा नं ४ का वडा अध्यक्ष श्रीकुमार श्रेष्ठको अध्यक्षतामा वडा कार्यालयमा गरिएको सार्वजनिक सुनुवाई (Public hearing) कार्यक्रममा देहायबमोजिमको उपस्थिति रह्यो।

क्र.सं.	नाम/थर	ठेगाना	फोन नं.	हस्ताक्षर
1	श्रीकुमार श्रेष्ठ	अध्यक्ष	[illegible]	
2	[illegible]	[illegible]	[illegible]	
3	चन्द्रकुमार [illegible]	आ.ई., PID	9841401400	
4	[illegible]	CMS DSC6	9841758966	
5	प्रमिला अधिकारी	PID	9843691222	
6	रामलाल [illegible]	गोकर्णेश्वर-४	[illegible]	
7	[illegible] श्रेष्ठ	गोकर्णेश्वर-४	9860630254	
8	[illegible] श्रेष्ठ	गोकर्णेश्वर-४	9861505441	
9	सुजन पौडेल	गोकर्णेश्वर-४	9860611880	
10	[illegible] श्रेष्ठ	"	9841417055	
11	कल्पना थापा	गोकर्णेश्वर ४	9849591459	
12	मिना [illegible]	गोकर्णेश्वर ४	9841315745	
13	[illegible] कुमारी [illegible]	स्वास्थ्य समाज [illegible]	[illegible]	
14	[illegible]	"	" 98413582[illegible]	
15	[illegible]	गोकर्णेश्वर ४	[illegible]	
16				
17	कमल परियार	गो.न.पा.-४	[illegible]	
18	बाल कृष्ण [illegible]	गोकर्णेश्वर ४ [illegible]	9801247252	
19	[illegible]	गोकर्णेश्वर ४	[illegible]	
20	[illegible]	गोकर्णेश्वर [illegible]	9803148768	
21	[illegible]	गोकर्णेश्वर-४	98[illegible]51781562	

क्र.स	नाम/थर	ठेगाना	फोन नं	हस्ताक्षर
23	[illegible]	गोकर्णेश्वर-४	[illegible]	[signature]
24	D. साइली लामा			[signature]
24	टिका राम खड्का			[signature]
25	राज कुमार श्रेष्ठ	गोकर्णेश्वर ९३१-५	9851114073	[signature]
26	सह देव थापा	" "	9849235035	[signature]
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28	बिमल लामिछाने	[illegible]	9841176796	[signature]
29	ईशान पुयाल	काठमाडौं-2,	9851090702	[signature]
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33	देवधाम [illegible]			
34	[illegible] श्रेष्ठ		9843223492	
35	[illegible]	गोकर्ण - ४	9841482726	[signature]
36	कप्तान चन्द्र श्रेष्ठ	गोकर्ण-४	9848918992	[signature]
37	[illegible]	[illegible]	9849998503	[signature]
38	विजय कुमार श्रेष्ठ	वडा नं. ४	9810894531	[signature]
39	[illegible]	वडा नं.-४	9841943996	
40	कान्छा श्रेष्ठ	वडा नं. ४	9849984688	[signature]
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42	[illegible]		9860886434	
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45	[illegible]	वडा [illegible]		[signature]
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48	[illegible]	"		[signature]
49	[illegible]	"		[signature]
50	[illegible]	"		[signature]

क्र.सं.	नाम/थर	ठेगाना	फोन नं.	हस्ताक्षर
51	रमा श्रेष्ठ	गोकर्ण	9841766608	[signature]
52	[illegible]	[illegible]		[signature]
53	[illegible] श्रेष्ठ			
54	साजन [illegible]	"		
55	[illegible]	"		
56	[illegible]	"	9841229416	[signature]
57	[illegible]	गोकर्ण ४	9860042325	[signature]
58	जय प्रकाश राय	"	"	[signature]
59	[illegible]	"	9818343485	[signature]
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62	[illegible] लामा	"	982305603४	[signature]
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64	[illegible]	"		[signature]
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80	[illegible]	DSC-06	9841335542	[signature]

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Focal Group Discussion at Gokarna (Shopkeeper's Group)

आज मिति २०७८ साल माघ २५ गते तदनुसार 8 February 2022 का दिन गोकर्ण क्षेत्रमा ढल संजाल (Sewer Network at Gokarna) आयोजनाको संक्षिप्त वातावरणीय अध्ययन (Brief Environmental Study) को लागि यो अन्तरक्रिया गरिएको छ। अन्तरक्रियाबाट प्राप्त राय।सुझाव तल टिपोट गरिएको छ।

१. नाम : रविन्द्र कुमार तामाङ
काम गर्ने बेलामा छिटो छिटो काम होस। नराम्रो नहोस। त्यहि सुझाव छ मेरो।

नाम : मंगलि तामाङ (लामा चिया पसल)
ढल खन्न सुरु गरेपछि लगा लगा नरोकि गई रखौस। गाडी गुड्न धेरै समस्या नपरोस। आयोजना सबैका लागि भएकोले, यो गर्नु पर्ने काम हो।

२. नाम : उद्धव गुरुङ
(शान्ति ठिम कार्पेट)
हाम्रो कारखानाको ढल पनि हाल्न। यहाँ चाहि हामीले बनाउने हो। Dying, Washing हरुको काम यहाँ हुँदैन। कार्पेट निर्माण बनाउने काम मात्र हुन्छ। तर यहाँ १०० जना जति कर्मचारीहरु यहि बस्नु हुन्छ। त्यसैले यहाँको ढल पनि हाल्न पाए हुन्थ्यो।

४. नाम : फुर्बा योन्जन (योन्जन किराना पसल)
हाम्रो लागि बन्न आँटेको छ। बाटो चाहिँ भत्केर बसेको छ। ढलको पाइप हाले पछि पनि पिच गरिदिनु होला।

नाम : लोप सार्गो (जग्गा धनि) टहरा व्यक्ति
बाटो बनेपछि फेरि खन्न नहुने तर फेरि पिच गर्ने भए ठिकै छ। धुलो धुलो उड्यो भने त केहि हुँदैन, मलाई खनेर काम गर्दा हुन्छ।

नाम : मञ्जु लामा (किराना पसल)
यो बाटोमा तल पनि पाइप हाल्नु पर्ने यता माथि भन्दा तल बस्ती धेरै छ। माथि त बस्ती पनि छैन अनि रोड पनि भर्खर पिच भएको छ।

नाम : पेमा डोर्जे (खाना पसल)
आयोजना। बन्न लागेको त राम्रै होला। बाग्मती नदि सफा हुने हो भने राम्रै आयोजना होला। यसमा मेरो कुनै आपत्ती छैन।

Focal Group Discussion at Gokarna (Women's Group)

आज मिति २०७८ साल फागुन ६ गते तदनुसार 18 march 2022 का दिन गोकर्ण क्षेत्रका ढल संजाल (sewer network at Gokarna आयोजनाको संक्षिप्त वातावरणीय अध्ययन (Brief Environmental Study) को लागि यो अन्तरक्रिया गरिएको छ । अन्तरक्रियाबाट प्राप्त राय / सुझाव तल टिपोट गरिएका छ ।

१. नाम : अनिता राणा (होटल वाला)
काम त गर्न पर्छ होला । चिच गर्नु पर्यो, ढल हाले पछि । बाटोमा भएका सुधार गर्नु पर्यो । फोहोर जथाभावि फाल्नु भएन ।

२. नाम : ज्योति तामाङ (टेलर्स पसल)
यो काम हुन त हाम्रो लागि नै हो । तेहि पनि ढलको काम गरिसकेपछि बाटो बिग्रिने हुनाले ढलको काम सकेपछि ~~चिच~~ पिच गर्दिनु होला ।

३. नाम : रञ्जु तामाङ
यो आयोजना हाम्रो लागि नै राम्रो हो । तर पनि ढलको काम गर्दा सकेसम्म छिटो छिटो काम ~~छ~~ गर्नु होला ।

४. नाम : अंशु गौतम (बासिन्दा)
अवरोध धेरै हुन्छ होला । धुलो धेरै उड्छ होला । धुलोले स्वास्थ्य लाई हानी गर्ने हुनाले यति हेरेर काम गर्दिनु होला ।

५. नाम : शान्ति गौतम (किराना पसल, बासिन्दा)
ढल हाल्ने खाल्डोहरु खनेपछि पुरिदिनु होला । बाटो पिच गरिदिनु होला । काम सुरु गरे पछि छिटो छिटो सकाइदिनु होला । अनि बनि सके पछि पनि राम्रो सङ्ग सञ्चालन गरि दिनु होला ।

६. नाम : कान्छि गिरि (घर धनि)
ढलको पाइप त अस्तिन पनि हालेको थियो । अब केरि अहिले हाल्दा ढल लैजान पुग्ने ठूलो पाइप हाल्नु होला ताकि केरि खन्न नपरोस् ।

७. नाम : मिरा तामाङ (कस्मेटिक पसल)
काम छिटो छिटो गरिदिनु पर्यो । ढलको पाइप हाल्ने ठाउँ मेरो पसलको अगाडि भएको हुनाले ढलको काम गर्दा धुलो नउडाई काम गर्नु होला ।

८. नाम : बिना (चटपटे ठेला)
ढलको पाइप हाल्ने क्रममा हाम्रो व्यापार पनि चलि रहोस् । सबै ठाउँमा एकै चोटि नखनेर, खन्दै / पुर्दै गर्ने गरि काम गर्नु होला । धुलो धेरै नउडाइ काम गरि दिनु होला ।

Appendix-X: Photographs

Figure: Public consultation being done at Gokarna (1 April 2021)

Figure: Public consultation being done at Gokarna (1 April 2021)

Figure: Public notice of public hearing pasted at public place (4 Jan 2022)

Figure: Public notice of public hearing pasted at Gokarneshwor ward no 4 office (4 Jan 2022)

Figure: Public notice of public hearing pasted at Gokarneshwor municipality (4 Jan 2022)

Figure: Public notice of public hearing pasted at public place (4 Jan 2022)

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Figure: Public hearing being done at Gokarna (10 January 2022)

Figure: Public hearing being done at Gokarna (10 January 2022)

Figure: Public notice pasted at public place (8 Feb 2022)

Figure: Public notice pasted at public place (8 Feb 2022)

Figure: Public notice pasted at public place (8 Feb 2022)

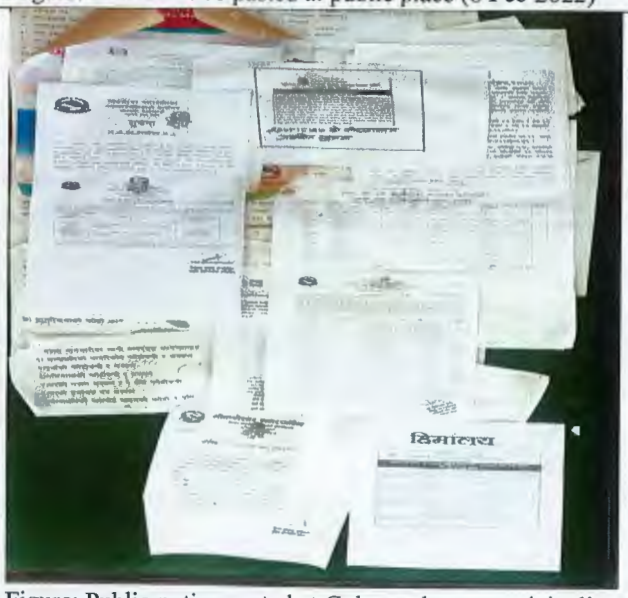

Figure: Public notice pasted at Gokarneshwor municipality (8 Feb 2022)

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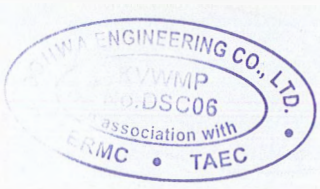
Appendix-XI: Standards

XI.1 Water Quality Standards

Tolerance limits for wastewater to be discharged into inland surface waters from combined wastewater treatment plant (generic standards)

Characteristics	Tolerance Limit
Total Suspended solids, mg/L, Max	50
Particle size of total suspended particles	Shall pass 850-micron Sieve.
pH	5.5 to 9.0
Temperature	Shall not exceed 40 degree C in any section of the stream within 15 meters down-stream from the effluent outlet.
Biochemical oxygen demand (BOD) for 5 days at 20 degree C, mg/L, Max	50
Oils and grease, mg/L, Max	10
Phenolic compounds, mg/L, Max	1
Cyanides (as CN), mg/L, Max	0.2
Sulphides (as S), mg/L, Max	2
Radioactive materials:	
a. Alpha emitters, c/ml, Max	7-Oct
b. Beta emitters, c/ml, Max	8-Oct
Insecticides	Absent
Total residual chlorine, mg/L	1
Fluorides (as F), mg/L, Max	2
Arsenic (as As), mg/L, Max	0.2
Cadmium (as, Cd), mg/L, Max	2
Hexavalent chromium (as Cr), mg/L,	0.1
Copper (as Cu), mg/L, Max	3
Lead (as Pb), mg/L, Max	0.1
Mercury (as Hg), mg/L, Max	0.01
Nickel (as Ni), mg/L, Max	3
Selenium (as Se), mg/L, Max	0.05
Zinc (as Zn), mg/L, Max	5
Ammonia nitrogen, mg/L, Max	50
Chemical Oxygen Demand, mg/L, Max	250
Silver, mg/L, Max	0.1
Source: Urban Environment Management Framework 2068 (2011), GON	

Note:
This generic standard applies to discharge of wastewater into inland surface waters from combined wastewater treatment plants. The municipal wastewater treatment plants in the proposed project will collect and treat only domestic wastewater from Kathmandu Valley. Therefore, in the absence of generic standards for domestic wastewater to be discharged into inland surface water from municipal wastewater treatment plants, this standard will only be applied as a guide. The project will assist in the development and implementation of domestic sewage discharge standards.



XI.2 Air Quality Standards

National Ambient Air Quality Standard, 2012 for Nepal

Parameters	Units	Averaging Time	Concentration in Ambient Air, maximum	Test Methods
TSP (Total Suspended Particulates)	$\mu g/m^3$	Annual	-	
		24-hours*	230	High Volume Sampling
PM10	$\mu g/m^3$	Annual	-	
		24-hours*	120	Low Volume Sampling
Sulphur Dioxide	$\mu g/m^3$	Annual	50	Diffusive sampling based on weekly averages
		24-hours**	70	To be determined before 2005.
Nitrogen Dioxide	$\mu g/m^3$	Annual	40	Diffusive sampling based on weekly averages
		24-hours**	80	To be determined before 2005.
Carbon Monoxide	$\mu g/m^3$	8 hours**	10,000	To be determined before 2005.
		15 minute	100,000	Indicative samplers ***
Lead	$\mu g/m^3$	Annual	0.5	Atomic Absorption Spectrometry, analysis of PM_{10} samples****
		24-hours	-	
Benzene	$\mu g/m^3$	Annual	20	Diffusive sampling based on weekly averages
		24-hours	-	
PM10	$\mu g/m^3$	24-hours	40	
Ozone	$\mu g/m^3$	8-hours	157	

***Note:** 24 hourly values shall be met 95% of the time in a year. 18 days per calendar year the standard may be exceeded but not on two consecutive days

****Note:** 24 hourly standards for NO_2 and SO_2 and 8 hours standard for CO are not to be controlled before MOPE has recommended appropriate test methodologies. This will be done before 2005

*****Note:** Control by spot sampling at roadside locations: Minimum one sample per week taken over 15 minutes during peak traffic hours, i.e. in the period 8am - 10am or 3pm - 6pm on a workday. This test method will be re-evaluated by 2005

******Note:** If representativeness can be proven, yearly averages can be calculated from PM10 samples from selected weekdays from each month of the year.

XI.3 Noise Exposure Limit

Recommended noise exposure limits for the work environment (adopted from Occupational Safety and Health Administration (OSHA)

S.No	Noise Exposure(dBA)	Permissible exposure (Hours and Minutes)
1.	85	16 hrs.
2.	87	12 hrs. -18 min.
3.	90	8 hrs.
4.	93	5 hrs - 18 min.
5.	96	3 hrs.-30 min.
6.	99	2 hrs. - 18 min.
7.	102	1 hr. - 30 min.
8.	105	1 hr.
9.	108	40 min.
10.	111	26 min.
11.	114	17 min.
12.	115	15 min.
13.	118	10 min.
14.	121	6.6 min.
15.	124	4 min.
16.	127	3 min.
17.	130	1 min.

Source: Marsh, 1991

Recommended Average Equivalent Sound Levels for Protecting the Public Health and Welfare

S.No	Land Use	Measure	To Protect Against Activity Interference and Hearing Loss
1.	Residential including farm residences	Leq (24)	55
2.	Commercial	Leq (24)	70
3.	Hospitals	Leq (24)	55
4.	Industrial	Leq (24)	70
5.	Educational	Leq (24)	55
6.	Recreational Areas	Leq (24)	70
7.	Farmland and general unpopulated land	Leq (24)	70

Source: U.S Environmental Protection Agency, 1974

Note: Leq (24) = Equivalent Sound Level in decibels for 24 hours.

XI.4 Vibration Level Standards

Recommended Standards for Vibration from Construction Sites

Type of Restriction	Area Classified	
Standard Value	I & II	85 dBA
Work Prohibited Time	I	7.00 P.M. - 7.00 A.M.
	II	10.00 P.M. - 6.00 A.M.
Maximum Working Duration	I	10.00 hrs. per Day
	II	14 hrs. per Day
Maximum Consecutive Working Days	I & II	6 Days
Working Prohibited Days	I & II	Saturdays & Holidays

Source: Vibration Regulation Law 64 of 1976, Japan

Notes:

1. Area I, stands for areas to which one of the following descriptions applies:
   - Areas where maintenance of quiet is particularly needed to preserve the residential environment.
   - Areas which require maintenance of quiet since they are need for residential purposes.
   - Areas need for commercial and industrial as well as residential propose which are in need of measures to prevent vibration pollution since a considerable number of houses are located.
   - The neighbourhood of schools, hospitals and the like.
   - Area II stands for areas where there is a need to preserve the living environment of in habitants and other than Area I.
2. Vibration level shall be measured at the boundary line of the specified construction work site.

Recommended Limits for Road Traffic Vibration

Area	Day time	Night time	Applicable areas
I	65 dB	60 dB	Areas where maintenance of quiet is particularly needed to preserve a good living environment and where quiet is called for us as they are used for residential purpose.
II	70 dB	65 dB	Areas need for commercial and industrial as well as residential purposes where there is a need to preserve the living environment of local inhabitants and areas mainly serving industrial proposes which are in need of measures to prevent the living environment of local residents from deteriorating.

Source: Vibration Regulation Law 64 of 1976, Japan

Note: Vibration level shall be measured at the boundary line of the road.

Appendix-XIII: Procurement Plan

4.4.1 Goods and Works Contracts Estimated to Cost $1 Million or More

Following table lists goods and works contracts for which the procurement activity is either ongoing or expected to commence.

Package Number	General Description	Estimated Value in Million USD	Procurement Method	Review (Prior/ Post)	Bidding Procedure	Advertisement Date (quarter/year)	Comments
KUKL/WW/ DEWATS	DEWATS (Hanumangh at and Gokarna)	7	ICB	Prior	1S2E	Q2/2020	Prequalification of Bidders: **N** Domestic Preference Applicable: **N** Bidding Document: DBO/ADB
KUKL/WW/ SN-04	Gokarna Sewer Network	3.0	OCB	Prior	1S2E	Q2/2020	Prequalification of Bidders: **N** Domestic Preference Applicable: **N** Bidding Document: Small Works/ADB
KUKL/WW/ FSM-01	Fecal Sludge Management	1.0	OCB	Prior	1S2E	Q2/2020	Prequalification of Bidders: **N** Domestic Preference Applicable: **N** Bidding Document: Small Works/ADB
KUKL/WW/ SN-03	Sewerage Network Cleaning and Rehabilitation in Core Area of LMC	4.50	ICB	Prior	1S2E	Q2/2020	Prequalification of Bidders: **N** Domestic Preference Applicable: **N** Bidding Document: Small Works/ADB

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Appendix-XII: Individuals Involved While Preparing the Report

No.	Position	Name	Mobile No.	Email	Signature
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3	Environmental Engineer	Dikshya Dhakal	9849333842	dikshyadhakal842@gmail.com	
4	Social Development Expert	Krishna Prasad Adhikari	9841572151	krishnap.adhikari@gmail.com	
5	Network Planner	Bharat Maharjan	9841404166	bmaharjan302@gmail.com	
6	Civil Engineer	Manish Pratap Singh	9863695103	shmanish60@gmail.com	
7	Contract/Procurement Engineer	Basu Dev Joshi	9867940779	basudevjoshi12@gmail.com	

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Comments/Suggestions Sheet of
"BES Report of Sewer Network Development in Gokarneshwor Municipality"

S.N	Description	Response
A.	**सिर्जना शाह, वन तथा वातवारण मन्त्रालय**	
१.	रिपोर्टको कभर पेजमा प्रदेश, जिल्ला उल्लेख गर्ने ।	Revised accordingly; Please refer the cover page.
२.	आयोजना निर्माणमा वैदेशिक सहायता रहेको कागजात पनि राख्नुपर्ने ।	The Gokarna Sewer Network Project was included in the Procurement Plan. The sheet that shows the procurement activity is attached in Appendix. Please refer Appendix-XIII: Procurement Plan.
३.	पेज नं. ५ मा contributing area को तालिकामा २ नं. वडा को बढी क्षेत्र देखिएको हुँदा सो को पनि सिफारिस पत्र राख्दा उपयुक्त हुने ।	The contributing area lies in three wards of Gokarna Municipality but construction of sewer network is only in ward no 4. Hence, recommendation letter from ward no 4 is only collected and attached in the report.
४.	पेज नं. १९ को Land use pattern तालिकामा देखाउदा उपयुक्त हुने ।	The land use data was not available at the municipality and also such data was not found through other secondary sources so the land use data has been provided based on the interaction with the ward chairman and the local people. Land use pattern data was not available so it is not shown in the table.
५.	निर्माण सामग्री के कति परिमाणमा चाहिने हो र कहाँबाट ल्याउने हो स्रोत खुलाउनुपर्ने ।	Information is added in the report. Please refer as incorporated in Ch 2, section I, pg 18 of the report.
६.	Waste water treatment plant कास्तो र कति क्षमताको राख्ने हो सो flow chart or diagram मा देखाउँदा अझै प्रष्ट हुने ।	Information of Waste water treatment plant is added in the report. Please refer as incorporated in Ch 2, section A, pg 2 , of the report.
७.	Methodology मा Biological Environment को पहिचान को लागि review गारिएका सन्दर्भ सामाग्रीको नामहरु प्रकाशन वर्ष सहित खुलाउनुपर्ने । Aquatic fauna नरहेको आधार के उल्लेख गर्ने ।	Added accordingly. Please refer as incorporated in Ch 3, section C, pg 31 and reference of the report.
८.	Methods मा Questionnaires प्रयोग गरिएको भए सो को नमुना पनि Annex मा राक्नु पर्ने ।	Please refer as attached in Appendix-I (ToR Appendix 2: Checklist and Questionnaire to be used in BES study) of the report.
९.	कति परिमाणमा musk निस्कने हो सो calculate गरेर राख्दा उपयुक्त हुने ।	The information is added in the report. Please refer as incorporated in Ch 2, section G, sub-section "Disposal of Surplus Material" pg 17 of the report.

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१०.	नक्सा तथा तालिकाहरुको स्रोत खुलाउनु पर्ने ।	Revised accordingly; Corrected in the whole report.
११.	वातवारणीय अध्ययन प्रतिवेदन तयार पार्ने विज्ञहरुको CV राख्नु पर्ने।	Individuals involved while preparing the report has been mentioned in Appendix-XII. The individuals are from the consultant team of PID for Kathmandu Valley Wastewater Management. Each individual's CV has been approved by PID.
१२.	सबै स्रोतहरु Reference मा नरहेकाले थप गर्नुपर्ने ।	Revised accordingly; Please refer as incorporated in Reference section, pg 74
१३.	Soil test गरेको भए report include गर्ने ।	Soil test was not carried out. Design criteria and consideration source is Detailed Design Report of Sewer Network Development in Gokarneshwor Municipality: KUKL/WW/SN-04.
१४.	Field survey गरेको मिति पनि खुलाउनु ।	Date of field survey is added in the report. Please refer as incorporated in Ch 3, section C, pg 31 of the report.
१५.	Waste water generation को २०३८, २०५३ सम्म (पुरानो) data रहेकाले available भए नँया data राख्नु पर्ने।	Revised accordingly; Please refer as incorporated in Ch 2, section F, sub section "Wastewater Quantity" pg 8, of the report.

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S.N	Section /Page	Issue	Comments	Response
B.	**Rajan Raj Pandey**			
1.	Table 2.3 pg. 6	Discharge for 2038 BS $6MLD_{avd}$ and $13.2MLD_{pcak}$ Discharge for 2053 BS $13.7MLD_{avd}$ and $30.7MLD_{pcak}$	IEE for over 5 MLD	Please refer as incorporated in Ch 2, section C, pg 3, of the report. Total discharge will be more than 5 MLD but in this project sewer line are selected in different route and are connect to the treatment plant from different point.
2.	Pg .8	The minimum soil cover provided above the crests of the sewer pipe is 1.0 m	1.0m below the rods may not be enough	As per code and load calculation, the minimum soil cover for DWC pipe for heavy traffic is 1.0 m. Hence the soil cover provided is enough for the selected pipes. Please refer as incorporated in Ch 2, section F, sub-section "Pipe Materials and Joints", pg 13, of the report.
3.	Pg.9	Altogether 158 numbers of manholes have been proposed. Brick manholes are 69 and precast ACC manholes are 83.	Figures do not match	Revised accordingly. Please refer as revised in Ch 2, section F, sub-section "Manholes", pg 13, of the report.
4.	Pg.10	In case of Area 2;i) especially small JCBs for excavation	Back hoe or excavator	Revised accordingly. Please refer as revised in Ch 2, section G, sub-section "Excavation and Stacking Materials", pg 15, of the report.
5.	Pg.16	TSP value is 50.176 ug/m^3, PM10 value is 43.237 ug/m^3 source: http//pollution.gov.np/,Feb 15 2021	The ratios between PM 10 and TSP were found to be between 0.6 and 0.75 should you measure it??	The data is taken from a secondary source. The values are instantaneous values of a particular time of the day. The information has been added in the report. Please refer as incorporated in Ch 3, section B, sub-section "Physical Environment/Ambient Air", pg 23, of the report.
6.	Pg.17	Minimum about 53 dab	Is it measured	Noise level data has been

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		and max. 77 dab		measured. The values are instantaneous values of a particular time of the day. The information has been added in the report. Please refer as incorporated in Ch 3, section B, sub-section "Physical Environment/Noise Level", pg 23, of the report.
7.	Table 3.1 pg 18	Population data	Is data for recent census available? OR during survey you must have collected exact data	During the design the recent census data (2021 preliminary data) was available. Please refer as incorporated in Ch 3, section B, sub-section "Socio Economic and Cultural Environment/Demographic Composition", pg 24, of the report.
8.	Pg.24	Data collection.....FGD	FGD for what??	Focus Group Discussions was done with the women's group and shopkeeper's group to collect their suggestions/ opinions for the construction period of the project.
9.	Pg.28	Env. Impact: physical: change in soil quality	I don't foresee	Revised accordingly; Deleted form the report.
10.		Soil erosion, land pollution and water pollution	Soil erosion may not be there	Please refer as incorporated in Ch 3, section E, sub-section "Construction Phase/Physical Environment/Soil erosion and slope instability", pg 35, of the report.
11.		Air pollution, land pollution and water pollution	Add gaseous pollution in description	Revised accordingly; Please refer as incorporated in Ch 3, section E, sub-section "Construction Phase/Physical Environment/Air pollution", pg 35, of the report.
12.		Land and water pollution	Repeated. pls. separate it from above.	Revised accordingly; Please refer as incorporated in Ch 3, section E, sub-section "Construction Phase/Physical Environment", pg 35-36, of the report.
13.	Page.29	Land and water and pollution	All repeated. Pls. separate land, water and air in three	Revised accordingly; Please refer as incorporated in Ch 3, section E, sub-section "Construction

			different heading	Phase/Physical Environment", pg 35-36, of the report.
14.		Air pollution noise pollution, and vibrations Air pollution	" "	Revised accordingly; Please refer as incorporated in Ch 3, section E, sub-section "Construction Phase/Physical Environment", pg 35-36, of the report.
15.		Air pollution	" "	Revised accordingly; Please refer as incorporated in Ch 3, section E, sub-section "Construction Phase/Physical Environment", pg 35-36, of the report.
16.	Page.35 -36	EMP table monitoring by Gokarneshwar municipality ward/ DSC/ CASSC	Pls. remove Gokarneshwar municipality ward	Gokarneshwor Municipality will bear 10% and PID will bear 90% of the total cost, so monitoring will also done by municipality.
17		Mitigation:- Designate Disposal site,-Transport excavated earthwork to the disposal site	Should have been- reinstate the top soil in the agro- fields.	Excavation will be done on existing road so it cannot be used directly on the agro-field. Please refer as incorporated in Ch 3, section F, Table 3-9, pg 41-42, of the report.
18		OVERALL COMMENT for EMP table	Columns "what Activity" and "how" should have been merged in to a single columns.	EMP table is in the format given in EPR 2020.
	Pg 39-40	Generation of waste	Cost needs to be mentioned	Please refer as incorporated in Ch 3, section F, Table 3-9, pg 46-47, of the report.
	Pg: 40	Last column site visit consultation with the public	Pls. delete this as is action not M&E.	Revised accordingly; Deleted from the table. Please refer as incorporated in Ch 3, section F, Table 3-9, pg 41-55, of the report.
	Pg :41	Last column site visit Records	Same as above.	Revised accordingly; Deleted from the table. Please refer as incorporated in Ch 3, section F, Table 3-9, pg 41-55, of the report.
	Pg.42	Last column	same	Revised accordingly; Deleted from the table. Please refer as incorporated in Ch

				3, section F, Table 3-9, pg 41-55, of the report.
	Pg.43	Last column	Same	Revised accordingly; Deleted from the table. Please refer as incorporated in Ch 3, section F, Table 3-9, pg 41-55, of the report.
		OVERALL COMMENT for EMP table	Mitigation and monitoring should be separated under 2 headings (columns)	EMP table is in the format given in EPR 2020.
	Pg. 44	Last column	Same as in pgs. 41, 42 etc.	EMP table is in the format given in EPR 2020.
	Pg.45and 46	Last column	Same	EMP table is in the format given in EPR 2020.
	Pg.48	Roles of both- municipality and word: monitoring, supervision, coordination with PID ard supervision consultant; monitoring of the EMP implementation/ mitigation effectiveness.	Undesirable	Revised accordingly ; Deleted from the table. Please refer as incorporated in Ch 3, section F, sub-section "Institutional Arrangement", Table 3-10, pg 57 of the report.
	Pg.53	Review of Relevant policy, Acts, Rule Regulation and Guideline	Rule and Regulation is same. Pls. use word- rules	Revised accordingly; Please refer as incorporated in Ch 3, section G, sub-section "Review of Relevant Policy, Acts, Rule and Guideline", pg 63, of the report.
		OVERALL COMMENT	Nothing is mentioned about the DWATS but, only sewer lines. Is not DWATS part of this construction??	DEWATS is not a part of construction of the sewer network. Hence detail information is not provided. However the information that "The DEWATS at Gokarna is a separate project" is mentioned in Ch 2, section A, pg 1 of the report.

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S.N		Description	Response
C.	**Kamal Adhikari** **Senior Sociologist** **Ministry of Urban Development**		
1.	Page iv	सारांसको साटो सारांश लेख्ने.	Revised accordingly; Please refer "कार्यकारी सारांश", pg v, of the report
2.	Page iv	यस खण्डमा वातवारण, वाटर ईकोसिस्टम्\ रिवर हेल्थ, पर्यटन सांस्कृतिक वातवारण एवम् जनस्वास्थ्यको महत्व दर्शाउने. बागमाती नदिको हालको पानीको गुणस्तर उल्लेख गर्ने. मेलम्चीको पानीको सन्दर्भ खुलाउने।	Revised accordingly; Please refer "कार्यकारी सारांश", pg v and Ch 2, section A & B , pg 2-3, of the report.
3.	Page iv	अध्ययन प्रक्रियाको साटो अध्ययन विधि तथा फोकस ग्रुप छलफल साटो फोकस ग्रुप डिस्कसन उल्लेख गर्ने.	Revised accordingly; Please refer page vi, of the report.
4.	Page vi:	निष्कार्ष पुगेन. यस खण्डमा अध्ययनको नतिजा सहित ठोस सुझाव प्रस्तुत गर्ने	Revised accordingly; Please refer as incorporated in "कार्यकारी सारांश", page vii and Ch 3, section H, pg 73, of the report.
5.	Page 1-2;	Mention relevance\ rationale	Relevancy of the Proposal and Rationality of Brief Environmental Study is mentioned in Ch 2, section B and C; pg 2 and 3, of the report.
6.	Page 11:	Where will the surplus excavated materials will be disposed? - indicate the site.	The information about the disposal site and the map showing the disposal site is mentioned in Ch 2, section G, sub-section "Disposal of Surplus Material", pg 17, of the report.
7.	Page 11:	Onsite GRM will be arranged- what is the mechanism?	Please refer as mentioned in Ch 3, section F, sub-section "Grievance Redress Mechanism (GRM)", page 60-62 of the report.
8.	Page 13:	Maintenance of personal Hygiene of workers.	Revised accordingly; Please refer as incorporated in Ch 3, section E, sub-section "Construction Phase/ Socio-economic and Cultural Environment", pg 37, and Table 3-9, pg 50, of the report.
9.	Page 17:	Mention latest census data.	Please refer as mentioned in Ch 3, section B, sub-section "Socio Economic and Cultural Environment/Demographic Composition", page 24 of the report.
10.	Page 18:	Impact of the population growth rate TREADS (2001- 2011: 3.6% AND 2011-2018: 0.7%)	Please refer as mentioned in Ch 3, section B, sub-section "Socio Economic and Cultural Environment/Demographic Composition", page 24 of the report.

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			Total growth rate percentage is not so different.
11.	Page20:	Clearly spell out load for sewer system.	Load for sewer system was not carried out. Design criteria and consideration source is Detailed Design Report of Sewer Network Development in Gokarneshwor Municipality: KUKL/WW/SN-04.
12.	Page 25-26:	Ensure if public opinion\ suggestion are in EMP.	Public opinion\ suggestions are ensured in EMP as well as the design. For example: the effluent pipe of the DEWATS is extended 150 m downstream of the Gokarneshwor temple.
13.	Page 27:	Beneficial impacts of project (employment\entrepreneurship\ skill- clearly spell out who will be benefited and how).	Added in the report. Please refer as incorporated in Ch 3, section D, sub-section "Employment generation", pg 34, and Table 3-9, pg 39, of the report.
14.	Page32-46 (Table 3-9):	Elaborate about contents of on the job training	Revised accordingly; Job training is not given so deleted from the report.
15.	Page 47	Mention the role of DOR, ward, municipality, Traffic office, etc.	Revised accordingly; Please refer as mentioned in Ch 3, section F, sub-section "Institutional Arrangement", Table 3-10, pg 59, of the report.
16.	Page 55:	Mention Draft of national water supply and sanitation policy 2014.	Revised accordingly; Please refer as incorporated in Ch 3, section G, sub-section "Review of Relevant Policy, Acts, Rule and Guideline", Table 3-11, pg 65, of the report.
17	Page 63:	Conclusion section should include context of the study, methodology, key field findings, impacts and recommendations. Further elaboration is needed.	Revised accordingly; Please refer as incorporated in Ch 3, section H, pg 73, of the report.
18		15%od:?? 9what about 15% HHS practicing OD lacking toilet?) its environmental implication	Please refer as incorporated in Ch 3, section B, sub-section "Socio Economic and Cultural Environment/ Health and Sanitation", pg 26, of the report.

S.N	Description	Response
D.	**Mr. B. R. Manandhar, Environmental Engineer & Freelancer Expert on physical environment, EIA/IEE/BES Report Suggestion Committee, MoWS,**	
1.	Features/ description of WWTP is missing.	Information of Waste water treatment plant is added in the report. Please refer as incorporated in Ch 2, section A, pg 2 , of the report
2.	As shown in fig. 2-3, it's not clear as to why\ how service wards are different from service area.	Revised Accordingly; Please refer as incorporated in Ch 2, section F, sub-section "Design Horizon", Figure 2-3, pg 8 , of the report.
3.	On Fig. 2-4, location of WWTP is not shown.	Revised Accordingly; Please refer as incorporated in Ch 2, section F, sub-section "Design Horizon", Figure 2-4, pg 10 , of the report.
4.	Drilling and stockpiling of construction materials seem to be missing from the list of construction activities.	Revised Accordingly; Please refer as incorporated in Ch 2, section J, pg 18, of the report.
5.	Operation phase activities are missing.	Revised accordingly; Please refer as incorporated in Ch 2, section J, sub-section "Operation and Maintenance Phase", pg 18, of the report.
6.	What are included as temporary facilities is not clear.	Revised Accordingly; Please refer as incorporated in Ch 2, section J, pg 18, of the report.
7.	It'd be better to give a brief description of impact area delineation comprising core impact area and surrounding impact area.	Revised Accordingly; Please refer as incorporated in Ch 2, section K, pg 19, of the report.
8.	It's not clear as to whether the values of ambient concentration of TSP, PM10 and PM2.5 are of a particular day or those averaged over a certain period of time.	The values are 24 hr average data of a particular day. The information has been added in the report. Please refer as incorporated in Ch 3, section B, sub-section "Physical Environment/Ambient Air", pg 23, of the report.
9.	It's not clear as to whether the measured noise levels are in instantaneous values of a particular time of the day/ night or equivalent levels of a certain period of time.	The values are instantaneous values of a particular time of the day. The information has been added in the report. Please refer as incorporated in Ch 3, section B, sub-section "Physical Environment/Noise Level "pg 23, of the report.
10.	Baseline information on current land- use pattern is missing.	The land use data was not available at the municipality and also such data was not found through other secondary sources so the land use data has been provided based on the interaction

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		with the ward chairman and the local people.
11.	Dates of field study are missing.	Revised Accordingly; Please refer as incorporated in Ch 3, section C, sub-section "Field Study" pg 30, of the report.
12.	The water body of which the water quality test was carried out needs to be specified.	Water quality test was not performed.
13.	The water body on which pollution impact is anticipated needs to be specified.	Revised accordingly. Please refer as revised in Ch 3, section D, sub-section "Improvement of water quality in the river/streams", pg 34, of the report.
14.	Adverse impacts of odor from WWTP, haphazard disposal of WWTP sludge and debris of dismantled temporary facilities seem to be missing.	The scope of this project is only sewer network. Hence the impacts of WWTP are not stated in the report.
15.	Impact-wise mitigation measures are completely missing.	Please refer as incorporated in Ch 3, section D & E, pg 34 -37 and Table 3-9, pg 39-55, of the report.
16.	The EMP should be consistent with the identified impacts and respective mitigation measures.	Revised accordingly. Please refer as revised in Ch 3, Table 3-9, pg 39-55, of the report.

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