

# **ENVIRONMENT, SOCIAL, HEALTH AND SAFETY MANAGEMENT STRATEGIES AND IMPLEMENTATION PLAN FOR**

## **CONTINUOUS WATER SUPPLY SCHEME HUBBALLI DHARWAD, KARNATAKA**



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## List of Abbreviations

BIS	Bureau of Indian Standard
BOCW	Building and other construction workers act
BOD	Biological Oxygen Demand
BU	Business Unit
HDMC	Hubli Dharwad Municipal Corporation
CDP	City Development Plan
CGWA	Central Ground Water Authority
CMPC	Construction Method Planning Center
CWRM	Clear Water Rising Main
CWPH	Clear Water Pump House
CPCB	Central Pollution Control Board
CPHEEO	Central Public Health Environmental Engineering Organization
CSIS	Communication and Stakeholders Intermediation Strategy
CSIU	Communication and Social Intermediation Unit
CWT	Contractor workmen training
DB	Design Build
DBOM	Design Build Operate Manage
DBOM&T	Design Build Operate Manage & Transfer
DPR	Detailed Project Report
DMA	District Metering Area
ELSR	Elevated Level Storage Reservoir
ECOP	Environmental Code of Practice
EHS	Environment Health & Safety
EHSD	Environment Health Safety Department
RW	Raw Water Pump House
WTP	Water Treatment Plant
IS	International Organization for Standardization

## 1. INTRODUCTION

### 1.1 Purpose of this ESHS-MSIP

- The Environmental, Social, Health and Safety Management Strategies & Implementation Plan (MSIP) is the document that specifies all activities and requirements for the promotion, development, and implementation of a comprehensive EHS Management System, applicable to the project.
- The Plan's main objective is to ensure that all operations, that affect or may potentially affect occupational health and safety, and/or which have or may potentially have an impact on the environment, are managed in compliance with the regulatory and legislative framework and the requirements set forth by international standards.
- The Plan's scope applies to all project phases, from mobilization through construction to closeout, and all work areas and Operation and Maintenance phases of the project based on the contract period

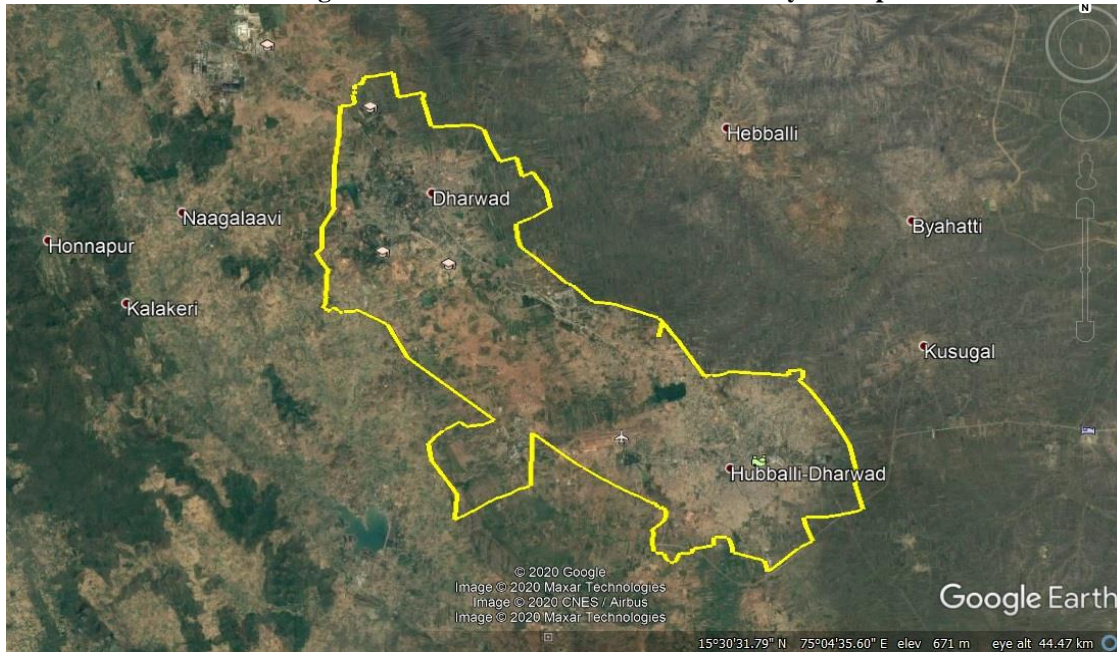
Since the ESHS-MSIP Plan is a “living document”, it will be reviewed and updated regularly by the DBOT, for the duration of the project, to address unforeseen hazards, cater to site-specific EHS needs and, if applicable, ensure compliance with changes to the regulatory and legislative framework.

## 2. PROJECT DESCRIPTION

Sl. No	Particulars	Description
1	Contract for	Design, Build, Operate Maintain and Transfer Water Supply System in Hubballi Dharwad System in Hubballi-Dharwad City of Karnataka State for cost effective and sustainable up-scaling to continuous 24X7 Pressurized Water Supply.
2	Date of Agreement /Effective date/Date of Commencement of Work	12.06.2020
3	Contract Start Date	12.06.2020
4	Employer	KUIDFC
5	Client	Hubballi-Dharwad Municipal Corporation
6	Operator	M/S Larsen and Toubro Construction
7	DBOE	M/S SMEC International Pty Ltd, Gurgaon
8	Expert Reviewer	SGI Studio Galli Ingeneria S.R.L Italy
9	Adjudicator	Mr. Tallur
10	Funding	67%-World Bank, 26%-HDMC, 7%- GoK
11	Contract Type	DBOT Contract
12	Duration	Design Build Duration 60 Months. O&M -4.5 Years (during DB) + 7 years.
13	Contract Value	1206.9 Crores

14	Project objective	To ensure Cost effective and Sustainable Continuous Pressurized 24x7 water supply to Hubli Dharwad city
15	Benefits	<ul style="list-style-type: none"> <li>To ensure and maintain water quality as per IS:10500</li> <li>Equitable service to the all the classes of people.</li> </ul>

Figure No-1 Location of Hubli Dharwad city in Map



## 2.1 Objective of the Project:

- The Project Development Objective is to improve the water service quality from an intermittent supply to a continuous supply across the project city of Hubli-Dharwad, through the establishment of sustainable service delivery arrangements at the ULB level.
- 24x7 supply is achieved when water is delivered continuously to every consumer of the service 24 hours a day, every day of the year, through a transmission and distribution system that is continuously full and under positive pressure.

## 2.2 Benefits of the Continuous water supply (24x7) Project:

The benefits of Continuous water supply (24x7) are:

- To deliver better quality water to the public.
- It gives significantly better service to all consumers.
- It revolutionizes service to the poor.
- It delivers effective 'supply management' and 'demand management'.

## 2.3 Project Components

### COLOR CODE KEY

	To be de-commissioned		Pre-existing, to be retained		New Construction
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Table No-1 List of permissions required component wise.

Sl. No.	Scheme Component	Location	Pre-existing / New Construction	Mention Statutory Permission(s) required, if applicable	Authority	Status	Remarks
1.	Intake-1	Jackwell Savdatti	Pre-existing	CEIG approval for switch yard	HESCOM	Granted	
				TPI of EOT -10 T Capacity	State Govt. Authorized person	Granted	
2.	Intake well	Saundatti	New Construction	-	-	-	Decision on Hold
3.	WTP	Amminbhavi	New Construction	Factory license	The Dept. of factories & boilers	-	Will be initiated after construction
				CEIG approval	HESCOM	-	
				Peso license for handling chlorine	Petroleum & Explosive Safety Organization	-	
4.	WTP-1, WTP-2 & WTP -3	Amminbhavi	Pre-existing	• Factory License Renewal	The Dept. of factories & boilers	Applied	
				CEIG approval for switch yard.	HESCOM	Applied	
				PESO license	Petroleum & Explosive Safety Organization	Applied	
5.	Clearwater pumphouse Dharwad	Amminbhavi	Pre-existing	TPI of HOT -10 T Capacity	State Govt. Authorized person	Granted	
6.	Clearwater pumphouse Hubli	Amminbhavi	Pre-existing	TPI of EOT -10 T Capacity	State Govt. Authorized person	Granted	
7.	Raw Water Pumping Station-1 for Dharwad	Savdatti	Pre-existing	Not Applicable			
8.	Raw water pumping station 2 for Hubli	Savdatti	Pre-existing	Not Applicable			



Sl. No.	Scheme Component	Location	Pre-existing / New Construction	Mention Statutory Permission(s) required, if applicable	Authority	Status	Remarks
9.	Raw Water Transmission Main (RWTM)	Savdatti to Amminbhavi Ch-0 to Ch-29510	New Construction	<ul style="list-style-type: none"><li>For Construction of Intake well, Coffor Dam and laying of Intake Pipes.</li><li>Pipe laying from approach bridge to pipe support bridge.</li><li>Construction of PCB at Malaprabha reservoir basin</li><li>Pipe laying from back waters of dam to private land.</li></ul>	KNNL (Karnataka Neeravari Nigam Limited)	Granted	Annexure Report 42 – Permission required details.
10.	Clearwater transmission main	Amminbhavi to Raipur Ch-0 to Ch-17712	New Construction	MS 1219 mm dia crossing at Rayapur (60 m)	SWR (South-Western Railway)	Applied	Report 42 - Details of permissions required.
				MS 864 mm dia, NR Betta GLSR to Desai Cross passing through SWR Golf Course (650 m)	SWR	Applied	
				MS 1219mm dia crossing BRTS Road at Rayaur (60 m)	BRTS	Applied	
				MS 762 mm dia passing through KIADB industrial area at Gamanagatti (3500 m)	KIADB (Karnataka Industrial Area Development Board)	Granted	
				MS 864 mm dia crossing forest at Rayapur (250 m)	Karnataka Forest Department	Granted	
				MS 762 mm dia passing through Forest at Rayapur (206 m)			
11.	DI pipe laying of 102 KM	Hubli &Dharwad	New Construction	DI 400 mm dia crossing of existing bridge at Ayodhya Nagar (358 m)	NHAI (National Highway Authority of India) of	Granted	Report 42 - Details of permissions required.
				DI 150 mm dia crossing Ittagatti Underpass (120 m)			
				DI 250 mm dia at service road beside Kelgeri Toll for a distance of 632 m towards Bangalore on			



Sl. No.	Scheme Component	Location	Pre-existing / New Construction	Mention Statutory Permission(s) required, if applicable	Authority	Status	Remarks
				NH 48			
				DI 250 mm dia crossing at Tejasvi Nagar, Dharwad (60 m)	SWR	Applied	
				DI 250 mm dia BRTS crossing at APMC 2 <sup>nd</sup> Gate Hubballi (60 m)	BRTS	Applied	
				DI 400 mm dia SH road at Dasankoppa (600 m)	PWD Dharwad	Applied	
				DI 250 mm SH road at Tejasvi Nagar, Kalagatti Road (220 m)			
				DI 600 mm dia from President Hotel to NR Betta (550 m)	PWD Hubballi	Granted	
				DI 500 mm dia from Desai Cross to Tabibland ELSR – along Smart city (HDMC) road at tabibland, Hubli (2000 m)	Smart City (HDMC)	Applied	
				DI 400 mm dia pipelaying from FCI Bommapur – along smart city (HDMC) road at Tabibland, Hubballi (1800 m)			
				DI 250 mm dia from gulganjikoppa jn to Kelgeri Topovan ELSR along KRDCL road from sub-urban police station Dharwad to kelgeri Topovan (3500 m)	KRDCL (Karnataka Road Development Cooperation Limited)	Applied	
12.	HDPE pipelaying of 2493 KM	Hubli &Dharwad	New Construction				Approved, waiting for permission to go ahead.
13.	House service connection of 145700 No’s	Hubli &Dharwad	New Construction				Approved, waiting for permission to go ahead.
14.	GLSR 1 (D-P1P1)	DC Compound	Pre-existing	Not Applicable			
15.	GLSR 2	DC Compound	Pre-existing	Not Applicable			

Sl. No.	Scheme Component	Location	Pre-existing / New Construction	Mention Statutory Permission(s) required, if applicable	Authority	Status	Remarks
16.	GLSR 3 (D-PIP1)	DC Compound	Pre-existing	Not Applicable			
17.	ELSR (D-PIP1)	DC compound	New Construction	Not Applicable			
18.	ELSR (D-PIP2)	Gulganjikop pa	Pre-existing	Not Applicable			
19.	GLSR (D-PIP2)	Gulganjikop pa	Pre-existing	Not Applicable			
20.	ELSR	IIIT Dharward Ext.	Pre-existing	Not Applicable			
21.	ELSR	Kalyan Nagar	Pre-existing	Not Applicable			
22.	ELSR (D-PIP2)	KC Park	Pre-existing	Not Applicable			
23.	ELSR (D-Demo)	Maddarmad di	Pre-existing	Not Applicable			
24.	GLSR (D-Demo)	Maddarmad di	Pre-existing	Not Applicable			
25.	ELSR	Mrityunjaya Nagar	Pre-existing	Not Applicable			
26.	ELSR	Navalur Ext	Pre-existing	Not Applicable			
27.	ELSR	Niduvani Layout	Pre-existing	Not Applicable			
28.	ELSR	Police headquarters	Pre-existing	Not Applicable			
29.	ELSR	Gulganjikop pa	New Construction	Not Applicable			
30.	GLSR	Navulur	New Construction	Not Applicable			
31.	GLSR	Udaigiri	New Construction	Not Applicable			
32.	GLSR	Yettingudda	New Construction	Not Applicable			
33.	ELSR	Kelgiri Tapovan	New Construction	Not Applicable			
34.	ELSR	Karnataka University	New Construction	Not Applicable			
35.	ELSR	Lakhamanahalli	New Construction	Not Applicable			
36.	ELSR	Rajaji Nagar Ext.	Pre-existing	Not Applicable			
37.	GLSR	Rajathgiri	Pre-existing	Not Applicable			
38.	ELSR	Sanmathinagar	Pre-existing	Not Applicable			
39.	ELSR (D-PIP2)	Saraswathpu ra	New Construction	Not Applicable			

Sl. No.	Scheme Component	Location	Pre-existing / New Construction	Mention Statutory Permission(s) required, if applicable	Authority	Status	Remarks
40.	ELSR (D-PIP2)	Saraswathpu ra	Pre-existing	Not Applicable	To be de-commissioned		
41.	GLSR (D-PIP2)	Saraswathpu ra	Pre-existing	Not Applicable			
42.	ELSR	Shambhavin agar	Pre-existing	Not Applicable			
43.	ELSR	Tadsin Koppa 1	Pre-existing	Not Applicable			
44.	ELSR	Tadsin Koppa 2	Pre-existing	Not Applicable			
45.	GLSR	Tarihal	New construction	Not Applicable			
46.	GLSR	Tejasvi Nagar	Pre-existing	Not Applicable			
47.	ELSR	Vanashree Nagar 1(HDUDA)	Pre-existing	Not Applicable			
48.	ELSR	Vanashree Nagar 2(Temple Premises)	Pre-existing	Not Applicable			
49.	ELSR	Vanashree Nagar 3(Mother Teresa School)	Pre-existing	Not Applicable			
50.	GLSR	Yettingudda (AU) Ext.	Pre-existing	Not Applicable			
51.	GLSR	Ayodhya Nagar Ext.	Pre-existing	Not Applicable			
52.	ELSR (H-PIP1)	Balaji Nagar	Pre-existing	Not Applicable			
53.	ELSR (H-PIP1)	Balaji Nagar additional	New Construction	Not Applicable			
54.	ELSR	Buddha Vihar	New Construction	Not Applicable			
55.	GLSR	Keshwapur Ext.	Pre-existing	Not Applicable			
56.	ELSR	Soniagandhi Ext.	Pre-existing	Not Applicable			
57.	ELSR	Bidnal Prop.	New Construction	Not Applicable			
58.	ELSR	FCI Bhommapur	New Construction	Not Applicable			
59.	ELSR (H-PIP2)	Gabbur	Pre-existing	Not Applicable			
60.	ELSR	Gokul Village	New Construction	Not Applicable			
61.	GLSR	Gowrishank ar	New Construction	Not Applicable			
62.	GLSR (H-	HDMC	New	Not Applicable			

Sl. No.	Scheme Component	Location	Pre-existing / New Construction	Mention Statutory Permission(s) required, if applicable	Authority	Status	Remarks
	PIP1)	additional	Construction				
63.	ELSR 1	HDMC	Pre-existing	Not Applicable			
64.	ELSR 2	HDMC	Pre-existing	Not Applicable			
65.	GLSR (H-PIP1)	HDMC	Pre-existing	Not Applicable			
66.	GLSR	Karwar Road Ext	Pre-existing	Not Applicable			
67.	ELSR	Karwar Road Ext	Pre-existing	Not Applicable			
68.	ELSR	Karwar Road	New Construction	Not Applicable			
69.	ELSR (H-PIP2)	Keshwapur Ext.	Pre-existing	Not Applicable			
70.	ELSR	FCI Location (Keshwapur)	New Construction	Not Applicable			
71.	GLSR	Krishnapur Ext.	Pre-existing	Not Applicable			
72.	ELSR (H-PIP2)	Mahadevi layout	Pre-existing	Not Applicable			
73.	ELSR	Murarji Nagar Ext	Pre-existing	Not Applicable			
74.	ELSR	Nehru Nagar Ext.	Pre-existing	Not Applicable			
75.	ELSR	Nekar Nagar Ext.	Pre-existing	Not Applicable			
76.	GLSR (H-PIP2)	NR Betta Circular	Pre-existing	Not Applicable			
77.	GLSR (H-Demo)	NR Betta Demo	Pre-existing	Not Applicable			
78.	GLSR	NR Betta OLD	Pre-existing	Not Applicable			
79.	ELSR	SM Krishna Nagar Ext.	Pre-existing	Not Applicable			
80.	ELSR	Sun City Ext.	Pre-existing	Not Applicable			
81.	ELSR	Sun City	New Construction	Not Applicable			
82.	ELSR (H-PIP1)	Tabibland 1	Pre-existing	Not Applicable			
83.	ELSR (H-PIP1)	Tabibland 2	Pre-existing	Not Applicable			
84.	ELSR	APMC	New Construction	Not Applicable			
85.	GLSR	APMC	New Construction	Not Applicable			
86.	GLSR	Navanagar	New Construction	Not Applicable			
87.	GLSR	Rayapur MBR	Pre-existing	Not Applicable			
88.	GLSR	Rayapur	Pre-existing	Not Applicable			

Sl. No.	Scheme Component	Location	Pre-existing / New Construction	Mention Statutory Permission(s) required, if applicable	Authority	Status	Remarks
		Village					
89.	ELSR	Bharati Nagar	Pre-existing	Not Applicable			
90.	Pipeline carrying bridge	Savdatti	Pre-existing	Not Applicable			
91.	Existing Pipelines (RWTM, CWTM, Distribution Network)	Entire Hubli & Dharwad	Pre-Existing	Not Applicable			

### 3. E&S Baseline

#### 3.1 Hubli Dharwad

Hubballi-Dharwad city is in Northern Karnataka and is an important educational, industrial, and commercial hub of the state of Karnataka. Hubballi is situated at 15° 20'N latitude and 75° 13'E longitude and Dharwad is situated at 15° 25'N latitude and 75° E longitude. The altitude of the twin cities varies from 764 m to 593 m with Dharwad being at a higher elevation. The twin city is located along National Highway No.4 which runs between Pune and Bengaluru cities and is at about 400 km from the State Capital, Bengaluru. The Project area is approximately 220 sq km.

It is imperative that the development plan of Hubballi-Dharwad has direct linkages with the water demand of the residents/consumers and distribution arrangements. The demographic growth of the twin cities has a direct bearing on the consumption of water in terms of quantity. Therefore, it is pertinent to understand the present and projected growth patterns across various economic sections of the societies in the project area. A study of the City Development Plan (CDP) reveals that Hubballi-Dharwad had land use planned to the extent of only 137.47 sq. km for the year 2021.

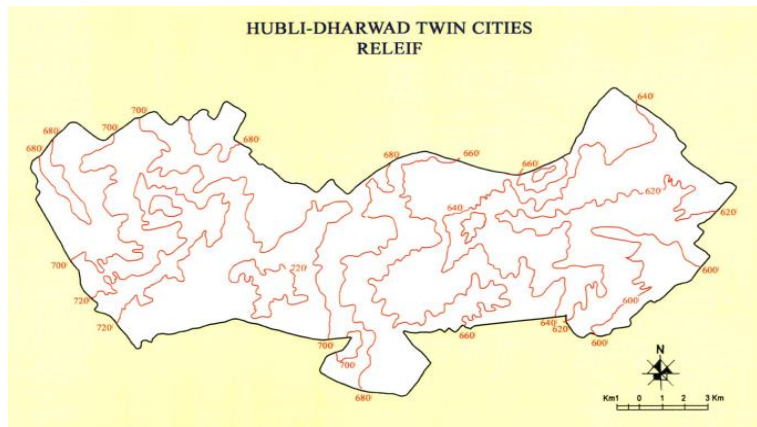
#### 3.2 Topography

Hubballi-Dharwad is situated at an altitude of 753 m (N-W Dharwad Tk) to 558 m. The twin city is on a beautiful site with strikingly picturesque surroundings, and excellent hillocks of half-hidden rising ground, the valleys, and the intervening flat ground along with ponds and tanks give a natural touch and air to the outlook of the town.

Topography is sloping towards the south and southeast. This region ranges from 591 to 752 meters towards the north, northeast and southeast, the area presents an open rolling type of topography with slow ups and

downs and is covered with black cotton soil. Towards the west and the southwest, the terrain slowly rises to meet the spurs of the Sahyadri hills and presents a typical Malnad topography.

Hubballi City is built on either side of the Unkal halla (stream) which happens to be the major drainage pattern for this region and merges into the Gangavali River. Hubballi-Dharwad stands on the watershed of the two drainage systems - one flowing to the east and draining into the Bay of Bengal and the other flowing to the west and draining into the Arabian Sea. Old Hubballi is situated on the Western bank and to the Eastern side, new extension of the old core has developed. Towards the North-West, the city is flanked by the Unkal hillock with a spot height of about 800m and then gently dips towards east and south. The altitudinal range is from 650 to 700 meters above sea level. The main core of the city is developed on the flat surface of the landscape.



**FIGURE 2: HUBBALLI-DHARWAD TWIN CITIES RELIEF**

Dharwad City, which is in the semi-Malnad tracks, has been built on hillocks which provide excellent scenic features. The city has many natural water bodies and flat spurs. On account of its beautiful topography and salubrious weather conditions, the Karnataka University Campus, which is built on hillocks, is called the 'Chota Mahabaleshwar'. Altitudinally it varies from 750 to 825 meters above mean sea level.

Comparatively, Dharwad is more undulated than Hubballi and has a higher elevation of 84 meters from the other. Especially in the Dharwad unit, we witness different geomorphological features like concave, convex, dome shape, hogbacks, escarpment hill with twin peaks, arete, and specific wind gap near Athikolla. The analysis of the slope and its representation is an important factor of relief expression. The roads and railways have generally followed the flat surfaces avoiding the higher slope which is more pronounced at Hubballi than at Dharwad. Earlier settlements were constructed mostly on flat surfaces, but the core of the town developed on plain surfaces, while modern extensions have developed on the hillocks with greater relative relief.

### 3.3 **Eco-sensitive Areas:** This Hubballi- Dharwad Project does not fall under the eco sensitive area.

#### 3.3.1 Monuments & Heritage:

List of monuments and heritage sites as per Archaeological Survey of India:

Name Of The Monument/Site	Location
Two Forts Gate (Inner & Outer)	Dharwad
Chandramouleswar Temple	Unkal
Basavannadevi Temple	Tambur

Chandramouleswar Temple is very near Unkal Circle and Unkal Lake (on Old NH4 between Hubballi and Dharwad). It is on the old Pune – Bangalore highway NH4, about 3 km north of Hubballi city center. A fort that was built in 1904 over an area of about 76 acres is located on Highway NH4, about 15km from Hubballi city center. The famous Durgadevi temple is also situated in this area. The project activities are not expected to impact these structures. However, necessary approval shall be obtained from National Monuments Authority, for carrying out construction within 300 m of the monument. In addition, construction activities need to consider precautionary measures to avoid damage to archaeological structures during excavation works and clearances from the National Monuments Authority.

Famous temples of cities are Shri Siddharoudha Math, Mourusavir Math Hubli, Durgadevi Temple Maratha Colony Dharwad & Shri Someshwara Temple Dharwad.

Educational institutions: KCD college, boys & girls Teachers training college, Vidyavardhak Sangh, Poet D.R. Bendre house Dharwad are heritage buildings. Lamington School, Chandrakala Theatre and HDMC building in Hubli are also heritage buildings

#### 3.3.2 **Places of historical:**

A wide variety of historical sites, temples, and churches exist in and around the city, most notably the Dharwad Fort, Chandramouleswara temple at Unkal, Mailaralinga temple(Vidyagiri), Jama Masjid, Malapur Masjid, Unka Hill(Northern part), All Saints Church, Basel Mission Church, Azad Park, and others.

### 3.4 **Climate (summer-winter temperatures, rainfall, seasonal variations, etc.)**

Figure 3: Climate data of Hubli

Climate data for Hubli													
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average high °C (°F)	29.1 (84.4)	31.7 (89.1)	34.5 (94.1)	40.0 (104.0)	38.5 (101.3)	28.2 (82.8)	25.9 (78.6)	25.6 (78.1)	27.7 (81.9)	29.2 (84.6)	28.7 (83.7)	28.2 (82.8)	30.6 (87.1)
Average low °C (°F)	14.5 (58.1)	15.7 (60.3)	18.6 (65.5)	27.0 (80.6)	25.0 (77.0)	20.9 (69.6)	20.9 (69.6)	20.2 (68.4)	19.6 (67.3)	18.8 (65.8)	16.5 (61.7)	14.3 (57.7)	19.3 (66.8)
Average rainfall mm (inches)	0 (0)	0 (0)	10 (0.4)	40 (1.6)	60 (2.4)	150 (5.9)	210 (8.3)	200 (7.9)	110 (4.3)	60 (2.4)	30 (1.2)	0 (0)	870 (34.4)



Hubballi-Dharwad has a tropical wet and dry climate. Summers are hot and dry, lasting from late February to early June. They are followed by the monsoon season, with moderate temperatures and a large amount of precipitation. Temperatures are fairly moderate from late October to early February, with virtually no rainfall. Hubballi is 640 meters above sea level. The average yearly rainfall is 838 mm. During 2019, Dharwad district recorded 1224 mm of rainfall which is (+)53% more than its normal value of 798 mm and the district can be classified under Excess category. All 5 Taluks recorded Excess rainfall during 2019.

**Figure 4: Taluk-wise Annual Rainfall data during 2016-2019**

Region/State	Normal (mm)	2016		2017		2018		2019	
		Actual (mm)	% Dep	Actual (mm)	% Dep	Actual (mm)	% Dep	Actual (mm)	% Dep
<b>DHARWAD</b>	<b>798</b>	<b>485</b>	<b>-39</b>	<b>609</b>	<b>-24</b>	<b>721</b>	<b>-10</b>	<b>1224</b>	<b>53</b>
DHARWAD	904	636	-30	599	-34	869	-4	1446	60
HUBBALLI	725	473	-35	629	-13	628	-13	1287	78
KALGHATGI	1029	542	-47	679	-34	867	-16	1476	43
KUNDGOL	729	381	-48	583	-20	679	-7	1045	43
NAVALGUND	634	365	-42	578	-9	565	-11	898	42

#### **Seasonal Rainfall Pattern during 2019:**

**Pre-Monsoon Season:** During the Pre-Monsoon season the district recorded actual rainfall of 91 mm, which is 36% less than the normal of 141 mm and is classified under the Deficit category. In the Dharwad district rainfall during Pre-Monsoon was Normal rainfall in Hubballi taluks, and deficit rainfall in Dharwad, Kalghatgi, Kundgol, and Navalgund taluks.

**South-West Season:** During the South-West monsoon season the district recorded actual rainfall of 804 mm, which is 61% less than the normal of 498 mm and is classified under the Excess category. In Dharwad district rainfall during South-West monsoon was Excess in all taluks.

**North-East Season:** During the North-East monsoon season the district recorded actual rainfall of 329 mm, which is 107% more than the normal of 159 mm, and is classified under the Excess category. In the Dharwad district rainfall during the North-East monsoon was Excess in all taluks

### **3.5 Demography – population, break-up by economic strata, gender, literacy, etc.**

**Table no -2, Demographics of Hubli-Dharwad**

Sl. No.	Attributes	Unit of measurement
1.	Population 2011	9,43,788
2.	Total no. of households	2, 00,418
2.	Area of Hubballi-Dharwad Municipal Corporation	202.28 sq. km

3.	No. of Wards	67
4.	Population Decadal Growth rate (2001-2011)	20.07%
5.	Population Density (2011)	4666 person per sq.km
6.	Literacy Rate	77%
7.	Sex Ratio	989
8.	Economy	Small and medium industries hub with more than a lakh small and medium industries

(Source: Census 2011 and ULB records), The city is divided into 67 Municipal administrative wards, the area and population is presented in Annexure 4.

### 3.5.1 Hubli Dharwad Population

In 2011, the total population of HDMC was 9, 43,778. The city has experienced low population growth during the last three decades (22.99 percent from 1981 to 1991, 21.24 percent, from 1991 to 2001, and 20.07 percent, from 2001 to 2011), compared to 52.54 percent decadal growth rate in 1961-71, despite being the second largest urban center in the state and the largest center for trade and commerce in North Karnataka region.

In 2011, the total population of the city was 943788. Population ranged from 6051 (ward no. 49) to 31796 (ward no. 54). Analysis of population distribution (ward-wise) showed that ward numbers 54, 40, 43, 11, 51, 50, and 42, were the most populated, while ward number 60, 59, 44, 39 and 25 were least populated.

**Table no -3, Population growth of Hubli-Dharwad**

Year	Population	Growth Rate (decadal - %)
1951	196180	
1961	248561	26.70
1971	379166	52.54
1981	527108	39.02
1991	648298	22.99
2001	786018	21.24
2011	943788	20.07

(Source: Census of India, 2011)

## 3.6 Water Resources: Availability and current level of use (Surface as well as groundwater)

The existing water supply to Hubballi and Dharwad twin cities is from Renukasagar Reservoir. Thus main source of Hubballi & Dharwad twin cities is surface water. However, for some of the areas in the cities, the source of water is groundwater. Hubballi Dharwad Municipal Corporation owns many bore wells; either with hand pumps or with power pumps in the twin cities and about 8.0 MLD of water is extracted and supplied from these bore wells. In addition to these, several private bore wells and open wells also exist in the cities. Bulk water is also being supplied to villages (raw water) between Saundatti and Amminbhavi from Malaprabha Water Supply Scheme (MWSS) and Kundgol Town (treated water).

### **3.6.1 Malaprabha Water Supply Scheme (MWSS)**

Malaprabha water supply scheme source is Renukasagar reservoir, located on the Malaprabha River near Saundatti. It is about 53 km from Hubballi and 42 km from Dharwad. Raw water is pumped from the jackwell to the WTP, Amminbhavi at 30 kms. Most of the infrastructure presently being used under MWSS has been constructed in mid-2000 and completed by 2010.

### **3.6.2 Neersagar Water Supply Scheme (NWSS)**

The source of the Neersagar Water Supply Scheme is Neersagar Reservoir on Bedti Nala, located near Dhumwad Village. The Neersagar Reservoir is located towards the southwest of Hubballi - Dharwad at about 23 km from Hubballi and 17 km from Dharwad. This is the old scheme which has been in operation for more than 55 years.

The NWSS consists of a Neersagar reservoir, jack well / intake, raw water transmission (gravity) main, raw water pumping station at Dhumwad, raw water transmission (pumping) main, WTP at Kanvihonnapur, clear water transmission and distribution to Hubballi and Dharwad. The system is designed for 40.86 MLD (9 MGD) in 20 hrs. However, presently the scheme is being discarded due to the unreliability of the source.

### **3.6.3 Ground Water Source**

Some areas of the city are supplied with groundwater sources from bore wells. 1596 bore wells out of 1814 are functioning. 1047 out of 1596 are fitted with power pumps of capacity varying between 1 HP and 12 HP. The approximate yield/supply from these bore wells fitted with power pumps is 8 MLD.

Water from bore wells is supplied either through a separate distribution system or filled into a public stand post for further collection. The bore wells are operated and maintained by KUWSDB. The bore wells act as a source of water in areas where there is no network coverage (with a surface source) or during non-supply days of surface water. Also, most of the industrial areas promoted by KIADB are supplied through bore wells due to a shortage of treated surface water.

As indicated by the Authorities, the quality of groundwater in Hubballi-Dharwad meets the permissible CPHEEO standards for potable water. As per Ground Water Resource Assessment-2020 issued by Central Ground Water Board vide Public Notice No. 16/2021, dated 12th October 2021, assessment unit "Hubballi & Dharwad" is categorized as Safe category.

## **3.7 Socio-cultural profile : important customs, events, etc.**

The district is a place for people belonging to various religions like Hinduism, Islam, Jainism, and Christianity. Hindus are spread across rural and urban areas. The widely spoken language in the district is Kannada. The district receives special recognition on the cultural map of the state. It has enriched the cultural fields like music, literature, and art by producing famous and memorable names. The prestigious Jnanapeeta awardee Dr. D. R. Bendre of Dharwad, has contributed to the field of literature, to the extent of infinity.

Renowned classical Hindustani singers like Kumar Gandaharva, Smt Gangubai Hangal, Mallikarjun Mansur, Pt. Bhimasen Joshi, Basavaraj Rajguru, and Sangeeta Katti have not only contributed to the field of music but have also made the district proud. The well-known artist Halbhavi also belongs to Dharwad.

### **3.8 Important industries and other economic activities undertaken in the city.**

Hubballi-Dharwad, the second largest Municipal Corporation in Karnataka State, was established in year 1962. The twin cities Hubballi and Dharwad play a vital role in the development of the State by contributing majorly in educational, commercial, industrial and economic sectors. In the agrarian context, the twin cities Hubballi and Dharwad are rich in natural resources and provide a considerable harvest of commercial crops such as cotton, ground nut, jowar, oil seeds etc.

### **3.9 Current status of water supply in the city (before advent of this project)**

The population of the Hubballi-Dharwad cities and Kundgol town is expected to reach 13,54,085 by the year 2031 and 15,80,927 by the year 2041 as per population projections. The present treated water requirement for the twin cities and Kundgol town is 188 MLD. This demand is expected to reach 224 MLD by the year 2031 and 258 MLD by the year 2041. The present supply capacity is about 142 Mld (74 MLD + 68 Mld) from the surface source and about 8 Mld from the groundwater source. There is a need for augmentation of the present water supply system to take care of the immediate as well as future water demand of the city. Considering transmission and treatment plant losses of 5% the raw water requirement to meet the water demand by the year 2041 is 251 MLD (92 Mcum per year). In addition to city requirements, bulk raw water is also being supplied to the en route 12 villages between Saundatti and Amminbhavi from the existing Malaprabha Water Supply Scheme (MWSS). The en route villages' raw water requirement is 5.62 MLD. The total raw water requirement of the City, nearby Industrial areas, Kundgol town, and en route villages is 279 MLD (102 M cum per year) by the year 2041.

The project proposes to utilize the entire quality of water from Renukasagar reservoir to meet future water requirements of the city.

**Table No -4, No of households with water pipe connection (on 30/09/2022)**

Sl. No	Zone	Total No. of Households (Properties) as per consumer survey	Total No. of piped connections (as per records)	% of house holds with piped water Supply
1	Hubli Demo Zone	9710	10186	105 %
2	Dharwad Demo Zone	7805	6936	89 %
3	Hubli P1P1 & P1P2	24674	21155	86 %
4	Dharwad P1P1 & P1P2	27705	22699	82 %
5	Hubli Intermittent Zone	132382	115437	87%
6	Dharwad Intermittent Zone			

Table No -5, Details of Demo Zone

Supply tanks	Capacity(ML)	Wards covered	Sub Zones	No of HSC
<b>Dharwad Source</b>				
Madarmaddi GLSR	2.72`9P,16P	5P,6P,7P,8P,9F,14P	6 to 64	6456
Madarmaddi OHT	0.113	9P,16P	1,2,3,4,5	445
<b>Hubli Source</b>				
NR Betta GLSR	2.724	39P,40P,41F,42P,43P,46P	4 to 119	10117
NR Betta garden GLSR	0.016	39P	1,2,3	42

**Hubballi Dharwad Demo zone pipeline network details:**

Table No -6, Details of Demo Zone Pipeline Network

<b>Dharwad Pipeline Summary</b>			
Dia	Specification	UoM	Scope
63	PE100, PN10	Km	23.41
110	PE100, PN10	Km	7.25
160	PE100, PN10	Km	3.53
200	PE100, PN10	Km	0.63
315	PE100, PN10	Km	1.22
Total in Km			36.04
<b>Hubballi Pipeline Summary</b>			
Dia	Specification	UoM	Scope
63	PE100, PN10	Km	47.454
110	PE100, PN10	Km	18.716
160	PE100, PN10	Km	5.900
200	PE100, PN10	Km	1.300
315	PE100, PN10	Km	1.700
400	CI	Km	0.170
100	CI	Km	0.420
Total in Km			75.66

Table No -7, Quantity of water supplied in LPCD

<b>Quality of water supplied to the citizens in LPCD</b>							
Sl. No	Zone	Water supplied Qty.(m <sup>3</sup> ) (per month)		Water supplied Qty. (m <sup>3</sup> ) (Avg. per day)		Population (as per consumer survey)	Water Supplied (LPCD)
		Amminbhavi	Kanvihonnapur	Amminbhavi	Kanvihonnapur		
1	Hubli Demo zone	354904.91		11448.55		81332	140.76
2	Dharwad Demo zone	176382.2		5689.75		57493	98.96
3	Hubli P1P1 & P1P2	707425.32		22820.17		231160	98.72
4	Dharwad P1P1 & P1P2	856650.55		27633.89		308251	89.65
5	Hubli Intermittent supply zone	2551767.43	747818.43	82315.08	24123.18	1131077	132.56

6	Dharwad Intermittent Supply zone	1348315.67	0	43494.05	0		
Overall		6743264.51		217524.66		1809313	120.23

#### **4. ESA FOR HUBLI DHARWAD SCHEME AND REQUIREMENTS THERE OF**

The Environmental and Social Assessment (ESA) provides the road Map for managing adverse environmental impacts arising from the implementation of such a project. For this, a Resettlement Plan is to be prepared as per the Resettlement Policy Framework (RPF) and a Corrective Action Plan is to be prepared for paying Compensation. Accordingly, RP/CAP is prepared and the same is already approved by WB. The report on PAPs/Compensation events RP/CAP is enclosed in the Report 60 A&B.

The ESA has been carried out to integrate environmental and social concerns with project design, identify potential adverse environmental and social impacts during different phases of project implementation, and recommend mitigation measures to comply with environmental and social safeguard policies of the World Bank, Government of India and Government of Karnataka. ESA objectives are to:

- Identify key social and environmental issues associated with the proposed water supply augmentation (24x7 Water supply) such as rehabilitation works to be implemented at the pre-construction, construction, and operation phases of the project.
- Identify of positive and adverse impacts of sub-project activities on the physical and social environment.
- To propose suitable mitigation measures for potentially adverse environmental and social impacts and measures for enhancement of positive impacts. This will attained through the Environmental Code of Practice that will ensure sound environmental and social management in the project and preparing specific Environmental and Social Management Plans (ESMP).
- Detail the roles and responsibilities of various agencies involved in carrying out the proposed action plans.
- Review the experiences from the predecessor project in the demo zones.
- Socio-economic profiling and stakeholder consultations.
- Identify any indigenous people.
- Resettlement policy framework and preparing a Resettlement Action Plan(RAP).

There are project-affected people concerning the land and the dwellings for which there is a resettlement policy framework document that deals with the timely compensation for these affected people. Also, there may be environmental impacts like air and noise pollution during the construction activities for which the ambient air monitoring and noise are being monitored. The social assessment will be done as below:

- Understanding ground truth: Visit to entire pipe laying area of RWTM & CWTM. Checking the alignment, where the pipe is going through, and collecting the information regarding the ownership and other details.
- Comparison with socio-economic status: Comparing



- c. The information on the socio-economic status of the land owners, their income and expenses of the family, and how they are dependent on crops that they have grown.
- d. Preparing the list of PAPs: Collecting the information of all the land owners and preparing the list. Scrutinized whether they are coming under the category of PAP or not.
- e. Public Consultation meetings: Conduct the public consultation meetings at RWTM & CWTM PAPs separately before intimating the time date and venue.
- f. Preparation report on public consultation
- g. Need to prepare the report on public consultations with outcomes issues, & suggestions.
- h. Meeting with Line Departments: Visiting to Agriculture and Horticulture & APMC departments and had meetings with officials regarding the yield and rates of the crops and collected the details.
- i. Survey with Committee
- j. Visiting the field with committee members to check realistic data.
- k. Report approval from the committee
- l. After visiting the field, the committee will approve the PAPS report.
- m. Valuation of loss of assets as per committee: The committee will evaluate the loss of assets and crops and will suggest the rates for the loss.
- n. Determination of crop compensation: The committee will determine the crop compensation as per total loss of guntas in particular land and fix the rate as per Agriculture and Horticulture yield & APMC rates.
- o. Payment of Crop compensation: The mode of payment is followed by the committee suggestions by issue of Cheque or direct payment to the PAPs bank account and the compensation should be provided to the concerned farmers.

## 5. ESHS-MSIP

### General requirements

**Table No-8 – Generic Documents Applicable**

P-1	SCHEME COMPONENT →	Generical Documents applicable for Pre-Construction, Construction and Post Construction Phases.				
No.	ESHS Issues	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Stacking of construction materials.	<ul style="list-style-type: none"> <li>Ensure material suppliers have the necessary permits to source it from authorized sites</li> <li>Stacking the materials in the working premises by their size/length separately for handling easy and in a countable manner.</li> </ul>	Annexures Report No.1  Approval of Construction Materials	Ecop 1 Planning & Design	DBOT	DBOE/PIU



P-1	SCHEME COMPONENT →	Generical Documents applicable for Pre-Construction, Construction and Post Construction Phases.				
No.	ESHS Issues	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
2.	Site management plan	Implementation of Site Logistic Plan covering: <ul style="list-style-type: none"> <li>Construction Material stacking</li> <li>Site Security &amp; Access Control</li> <li>Electrical cable routing</li> <li>Site drainage /dewatering plan</li> <li>Labor Camps (including those of sub-contractors) etc.,</li> <li>Waste Management &amp; disposal</li> </ul>	Annexures <ul style="list-style-type: none"> <li>Picture No.1 -Site layout</li> <li>Report No.2 -SOP Waste Management Plan</li> </ul>	ECOP-2 Site Preparation	DBOT	DBOE/PIU
3.	Hazards at workplace.	First Aid Measures : <ul style="list-style-type: none"> <li>First aid center with first aid facilities with Paramedical First Aider, basic First-aid kit and 24*7 Ambulance Facility.</li> <li>MOU with nearby Hospitals and frequent Visits of Govt. certified Doctor is ensured.</li> <li>Monthly First Aid box inspection with tag.</li> <li>First Aid registers for recording the first aid cases.</li> <li>Arranged the Anti Venom at MOU Hospital.</li> </ul> Trained Snake catchers will be deployed in case of emergency with the help of Forest dept official's guidance only.	Annexures <ul style="list-style-type: none"> <li>Report No-3 - MoU with Hospital Report and Location Map between Hospitals and Sites</li> <li>Picture No 2 - First Aid Centre and Medical Facilities</li> </ul>	<ul style="list-style-type: none"> <li>Appendix-1, Schedule-2</li> <li>ESA Report.</li> <li>ECOP 3.0: Construction Camps Management</li> </ul>	DBOT	DBOE/PIU
4.	Fire Hazards	Fire Safety Measures: <ul style="list-style-type: none"> <li>The Stock of Fire extinguishers, fire buckets, and portable fire extinguishers are in fire hazard-prone areas.</li> <li>A list of Fire extinguishers is maintained.</li> <li>Monthly inspection of fire extinguishers and fire extinguisher tags is implemented.</li> <li>Fire drill for the employees and the workmen.</li> <li>Maintains the fire extinguisher in Vehicles and P&amp;M equipment.</li> <li>Displaying 'No Smoking' signage where flammable materials are in storage.</li> </ul>	Annexures <ul style="list-style-type: none"> <li>Reports No-4- Fire Extinguisher List and Inspection of Fire Extinguishers</li> <li>Pictures No-4 - Fire Safety Measures</li> </ul>	<ul style="list-style-type: none"> <li>Appendix-1, Schedule-2</li> <li>ESA Report.</li> <li>ECOP 3.0: Construction Camps Management</li> </ul>	DBOT	DBOE/PIU
5.	Emergency Response Arrangements	<ul style="list-style-type: none"> <li>Formation of the Emergency Response Committee and communication of the Emergency Response Plan</li> <li>Internal and other emergency contact numbers are displayed.</li> <li>Escape exits/ Evacuation routes are pre-marked.</li> <li>Monthly Emergency Mock drills are conducted.</li> </ul>	Annexures <ul style="list-style-type: none"> <li>Report No-5 Emergency Response Plan</li> <li>Pictures – 5 Emergency Response Measures</li> </ul>	<ul style="list-style-type: none"> <li>Appendix-1, Schedule-2</li> <li>ECOP: Table 10: Environmental Health and Safety Management Plan</li> </ul>	DBOT	DBOE/PIU

P-1	SCHEME COMPONENT →	Generical Documents applicable for Pre-Construction, Construction and Post Construction Phases.				
No.	ESHS Issues	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
6.	Traffic Management Plan when the material/ equipment/ vehicles spread to the road./during excavation along the road	<ul style="list-style-type: none"> <li>• Double-layer Hard Barricade with retro-reflective stickers.</li> <li>• Ensuring the Cautionary boards, signage boards, and Road diversion boards.</li> <li>• Deployment of Flagman.</li> <li>• During nighttime, button lights are provided to control the traffic.</li> <li>• The Excavator or Backhoe loader swinging area is cordoned off.</li> </ul>	Annexures <ul style="list-style-type: none"> <li>• Picture No-6 Traffic Management Measures</li> <li>• Report No-06, Traffic Management Plan</li> </ul>	<ul style="list-style-type: none"> <li>• Appendix-1, Schedule-2</li> <li>• ECop 11.0</li> </ul>	DBOT	DBOE/PIU
7.	Debris / Excavated Earth Management and Topsoil Conservation	<ul style="list-style-type: none"> <li>• Implementation of Excavated Earthwork Soil Storage and Disposal Management Plan.</li> <li>• Implement C&amp;D waste Management Plan.</li> </ul>	Annexures <ul style="list-style-type: none"> <li>• Report N0-7 &amp; 8 Approved Soil Dumping location and Map</li> <li>• Report No-2-C&amp;D waste Management plan</li> <li>• Report No-27 Topsoil management plan</li> </ul>	ECop 14.0: Soil Management	DBOT	DBOE/PIU
8.	Workers Safety	Welfare measures <ul style="list-style-type: none"> <li>• Medical screening</li> <li>• Medical Health Checkup</li> <li>• EHS Induction before engaging into the sites.</li> <li>• Provision of Workmen Habitat and Frequent Workmen Camp Inspection.</li> <li>• Security Services &amp; CCTV Maintenance</li> <li>• Drinking water –RO facility and maintained Drinking water Audit Checklist.</li> <li>• Enough potable water is being made available for drinking at all locations.</li> <li>• Sanitary Facilities and provision of soak pits and disposal through an agency.</li> <li>• Separate Designated Kitchen areas are provided at all labor camps.</li> <li>• Regular Pest and Insect control measures are ensured to avoid mosquito/pest breeding.</li> </ul>	Annexures <ul style="list-style-type: none"> <li>• Report No-10, Labour Management Plan</li> <li>• Picture No-08</li> </ul>	Management plan for public and workers safety (ECop 10.0)	DBOT	DBOE/PIU
9.	GRMs (Grievance redressal mechanism)	<ul style="list-style-type: none"> <li>• Operator DBOT has an overarching GRM in place</li> </ul>	Annexures <ul style="list-style-type: none"> <li>• Report No-12 - EHS Suggestion procedure.</li> <li>• Picture No-9 - Grievance redressal mechanism</li> </ul>	Management plan for public and workers safety (ECop 10.0)	DBOT	DBOE/PIU
10.	Anti-sexual harassment	The operator has put in place an anti-sexual harassment redressal mechanism as mandated by law.	Annexure <ul style="list-style-type: none"> <li>• Report No.13 - Anti Sexual Harassment</li> </ul>	Management plan for public and workers safety	DBOT	DBOE/PIU

P-1	SCHEME COMPONENT →	Generical Documents applicable for Pre-Construction, Construction and Post Construction Phases.				
No.	ESHS Issues	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
	mechanism		circular	(ECoP 10.0)		
11.	Community/ Stakeholder Engagement, Consultation and Outreach Mechanism	Undertake consultations as per the Communication Action Plan	Annexure <ul style="list-style-type: none"> <li>Report No.14 Communication Action Plan</li> </ul>	Vol-1, Part-3  Clause 9.3 Consultations Strategy and Participation Framework	DBOT	DBOE/PIU
12.	Accident and incident reporting arrangements	<ul style="list-style-type: none"> <li>Maintain accident/incident register at the site.</li> <li>Reporting of accidents and incidents and taking corrective action.</li> </ul>	Annexures <ul style="list-style-type: none"> <li>Reports No.15 - Incident Investigation report</li> <li>Picture No-10 , Incident Investigation Matrix</li> </ul>	<ul style="list-style-type: none"> <li>Appendix-1, Schedule-2</li> <li>ESA Document</li> </ul>	DBOT	DBOE/PIU
13.	Site Restoration	<ul style="list-style-type: none"> <li>Restore access road(s)</li> <li>Removal of temporary structures</li> <li>Removal of contaminated soil, waste material, etc.</li> <li>Plantation/landscaping if required</li> </ul>	Annexures <ul style="list-style-type: none"> <li>Report No.20 - Road Restoration</li> <li>Picture No-11- Road Restoration</li> </ul>	<ul style="list-style-type: none"> <li>Appendix-1, Schedule-2</li> <li>ECoP Table No 8</li> </ul>	DBOT	DBOE/PIU

Note: As in pre-construction stage, there are many activities which are common, hence we are providing generic documents applicable to the entire project phases.

## PRE-CONSTRUCTION STAGE

### 5.1 PRE-CONSTRUCTION STAGE

**Table No-9,  
COMPONENT WISE PRE-CONSTRUCTION (PLANNING AND DESIGN) STAGE IMPACTS**

SCHEME COMPONENT →		INTAKE WELL AT SAVDATTI (Pre-existing)- P- 1				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Wet condition due to Leakages.	Rectifying the leakages by waterproof treatment for the roof slab.	N/A	Volume 3 Clause 52. Schedule 10 B	DBOT	DBOE/PIU
2.	Damaged doors & windows	<ul style="list-style-type: none"> <li>Rectification of doors &amp; windows will take place in the near future.</li> <li>Replacement of windows by last quarter of 2023</li> </ul>	N/A	Volume 3 Clause 52. Schedule 10 B	DBOT	DBOE/PIU

SCHEME COMPONENT →		INTAKE WELL AT SAVDATTI (Pre-existing)- P- 1				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
3.	Absence of rainwater collection pipes in Hubli control room	Replacing rainwater collection pipes with new ones to provide safe disposal of water	N/A	Volume 3 Clause 52. Schedule 10 B	DBOT	DBOE/PIU
4.	Air cracks on walls of storeroom	Providing cement slurry & sealing the openings	N/A	Volume 3 Clause 52. Schedule 10 B	DBOT	DBOE/PIU
5.	Absence of exhaust fan	Installation of exhaust fan with all necessary electrical connection	N/A	Volume 3 Clause 52. Schedule 10 B	DBOT	DBOE/PIU
6.	Absence of supporting pillar for Dharwad Pump No-1	Providing supporting pillars with reinforcement for firm support.	N/A	Volume 3 Clause 52. Schedule 10 B	DBOT	DBOE/PIU
7.	Unauthorized access	Providing precast boundary wall (3M height) for the entire intake premises to make it a restricted premise as a part of water security with necessary steel gates wherever necessary.	Report No-22-SOP for WTP O&M	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT		WATER TREATMENT PLANT-AMMINBHAVI (New construction)—P3				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	The Construction site and Existing WTP are on the same premises, and safety measures to avoid any untoward incidents.	<ul style="list-style-type: none"> <li>Site Security &amp; Access Control.</li> <li>Hazardous Zone warning and other cautions signage display.</li> <li>Separate Office arrangement for Construction site team.</li> <li>Rest Shed separately is provided for the Construction Working Team.</li> <li>Adequate fencing/Boundary wall to be ensured.</li> <li>Restricted entry is ensured by security and entry register is available at entrance Gate</li> <li>CCTV facilities, Display of signage boards in vernacular language is ensured.</li> </ul>	Annexure  Report No-21 SOP for WTP civil activities from point 5.	ECoP 3.0: Construction Camps Management  ECoP 2.0: Site Preparation	DBOT	DBOE/PIU
2.	Electrical Overhead line within the construction area	<ul style="list-style-type: none"> <li>Providing goal post to avoid contact with an electrical line.</li> <li>Signages near the overhead electrical line.</li> </ul>	Annexure  Report No- 46 Shifting/Re-routing of existing electrical LT & HT lines along with poles.	ECoP 2.0: Site Preparation	DBOT	DBOE/PIU

3.	Accumulation of construction and Earth material waste.	<ul style="list-style-type: none"> <li>Soil is to be stacked near the WTP area for future backfilling.</li> <li>A designated location for soil shifting is identified. This will avoid space constraints during construction.</li> </ul>	Annexure Report No-7 & 8 Soil Dumping yard for excess soil	ECOP 14 Soil Management	PIU/ULB	DBOE/PM U
4.	Requirement of Water sources for construction works.	<ul style="list-style-type: none"> <li>Water Sources for Construction works: A) Water from approved sources like bore wells or ELSR/GLSR Structures. B) Water Source for Concreting works by RMC Vendors (Private agencies with their own source) Tanks Capacity 2000 to 2500 Liters Sintex Tank.</li> <li>Water quantity required – 2000 lit/day/structure</li> </ul>	Annexure Report No- 48 Temporary water source for construction works	ECOP 5.0 for Water for Construction	DBOT/PIU	DBOE/PM U

SCHEME COMPONENT →		WATER TREATMENT PLANT-1, 2 & 3 AMMINBHAVI (Pre-existing) P-4, P-5, P-6				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	The lifting Hoist arrangement for the PAC Bag is not available in the chemical dosing room.	<ul style="list-style-type: none"> <li>Considered in Infrastructure Improvement Plan (IIP).</li> <li>Arrange Hoisting Equipment to lift PAC bags in Chemical Room.</li> </ul>	N/A	ECOP 1.0: Planning and Design	DBOT	DBOE/PIU
2.	Inadequate fencing arrangement leading to trespasses of animals/Public.	<ul style="list-style-type: none"> <li>Proper fencing to be provided.</li> <li>Fencing is planned to be done at a height of around 6 feet with cement concrete pillars and will be covered by fencing mesh.</li> </ul>	N/A	ECOP: 10.0 Public and Worker's Health and Safety	DBOT	DBOE/PIU
3.	Absence of Handrails at the pathway to Filter bed houses and Flash Mixer Tank	<ul style="list-style-type: none"> <li>Handrails of GI Pipe DN40 for Aerator Surrounding, Chemical House, Clarifiers, Raw Water Channel to be provided</li> </ul>	Annexure Picture No. 38 Specifications of Handrails.	ECOP: 10.0 Public and Worker's Health and Safety	DBOT	DBOE/PIU
4.	Loading and Unloading Platform for Chlorine Tonners is not suitable condition	<ul style="list-style-type: none"> <li>Loading and Unloading Platform to be extended for safe unloading.</li> </ul>	Annexure Report No-23 Chlorine room drawing with space availability  Annexure Picture No.27 Chlorine Safety Measures	ECOP: 10.0 Public and Worker's Health and Safety	DBOT	DBOE/PIU
5.	<ul style="list-style-type: none"> <li>Absence of Lifting Hoisting mechanism for lifting and lowering of Chlorine Tonners.</li> <li>Absence of Tools and Tackles for lifting and lowering of Chlorine Tonners</li> </ul>	<ul style="list-style-type: none"> <li>Lifting Hoist Equipment to be planned for fixing in the Chlorination Storage shed.</li> <li>Spreader beam lifting tools &amp; tackles to be planned for arranging at the chlorine storage shed.</li> </ul>	Annexure Report no -47, Design drawing of Chlorine Tonner room. With Specifications – Electrically operated monorail 2 mt Hoist	ECOP: 10.0 Public and Worker's Health and Safety	DBOT	DBOE/PIU
6.	Absence of Scrubber System in chlorination	<ul style="list-style-type: none"> <li>Safety Valve to be provided on chlorine header line and it will be connected to caustic scrubber.</li> </ul>	Annexure	ECOP: 10.0 Public and Worker's Health and	DBOT	DBOE/PIU

WATER TREATMENT PLANT-1, 2 & 3 AMMINBHAVI (Pre-existing) P-4, P-5, P-6						
SCHEME COMPONENT →						
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
		<ul style="list-style-type: none"> <li>Plan for Scrubber unit.</li> </ul>	Picture No-36 Scrubber unit	Safety		
7.	The current Chlorine storage area doesn't have adequate safety measures.	<ul style="list-style-type: none"> <li>A new Chlorine Storage room is to be constructed as per safety measures. Details are submitted in IIP.</li> </ul>	Annexure Report No-23 Chlorine room drawing with space availability	ECoP: 10.0 Public and Worker's Health and Safety	DBOT	PIU
8.	<ul style="list-style-type: none"> <li>The gravity Gas Chlorinator unit was found in corroded condition. A manifold was not provided for cylinder in the unit.</li> <li>Absence of Guarding in Exhaust Fan at Chlorine Dosing Room</li> <li>Gauges are not working in the Chlorination unit.</li> <li>Only the Chlorine Dosing room is available, but the chlorinator is in bad condition.</li> <li>Storage room for chlorine toner is not available.</li> <li>No online measuring device for residual chlorine.</li> </ul>	<ul style="list-style-type: none"> <li>The chlorinator is to be changed on a Priority basis. Details are submitted in IIP, Till the infrastructure is developed Chlorine leak detector, Self-contained breathing apparatus, Chlorine suit, Emergency chlorine leak handling kit to arrest any leakages, trained competent workmen with emergency preparedness, Chlorine safety related mock drills are conducted frequently to create awareness are some of the safety measures are following.</li> <li>The Latest vacuum gas chlorinator or Gas chlorinator unit needs to be replaced.</li> <li>Common manifold with valve arrangement to be provided for safe operation and to avoid gas leakage.</li> <li>FRP Type Hood to be used on the tonner, Chlorine Hood with blower will be provided with scrubbing arrangement to avoid gas leakage.</li> <li>Gauges to be replaced</li> <li>Valve protection caps are to be used in the cylinder.</li> <li>Online chlorine measuring unit to be provided.</li> <li>3 eye wash fountains and 2 body wash stations with uninterrupted water supply are installed in the WTP chlorination unit.</li> </ul>		ECoP: 10.0 Public and Worker's Health and Safety	DBOT/DB OE	DBOE/PIU

WATER TREATMENT PLANT-1, 2 & 3 AMMINBHAVI (Pre-existing) P-4, P-5, P-6						
SCHEME COMPONENT →						
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
9.	Absence of chlorination Gas Leak Detectors with sensors	Chlorine Gas Leak Detectors with Sensors and Alarm to be planned for installation.	Annexure-  Picture No-28 Chlorine Leak Detectors  Report 47 – chlorine tonner room with neutralization pit  Report No-23 Chlorine room drawing with space availability	ECOP: 10.0 Public and Worker's Health and Safety	DBOT	DBOE/PIU
10.	Absence of Eye Wash and Shower station	Eye wash and body shower with uninterrupted water supply are to be installed.	Annexure-  Picture No-27 - Chlorine and Laboratory Safety Measures  Report 47 – chlorine tonner room with neutralization pit	ECOP: 10.0 Public and Worker's Health and Safety	DBOT	DBOE/PIU
11.	Absence of Emergency Chlorine Leak Handling Kit	An emergency Chlorine Leak Handling Kit is procured and placed in the chlorination room.	Annexure- Picture No-27& 28  Chlorine and Laboratory Safety Measures	ECOP: 10.0 Public and Worker's Health and Safety	DBOT	DBOE/PIU
12.	Absence of Personal Protective Equipment such as self-contained Breathing Apparatus with Oxygen Cylinders	Safety PPEs to be planned for procurement	Picture No-30  PPE Compliances -O&M	ECOP: 10.0 Public and Worker's Health and Safety	DBOT	DBOE/PIU
13.	Absence of Windssocks	Windssocks are provided.	Annexure-Picture No-33  Windssocks	ECOP: 10.0 Public and Worker's Health and Safety	DBOT	DBOE/PIU
14.	Absence of Insulated Rubber Mat at Electrical Panel	Insulated Rubber Mat to be planned for Procurement.	Annexure-Picture No 29  Electrical Compliances - O&M	Volume 3- Clause 52.	DBOT	DBOE/PIU
15.	Absence of Fire Extinguishers ABC, CO2, foam, Fire Buckets at required location	Provision for Fire Extinguishers, Fire Buckets	Annexure-  Report no – 4, list of fire extinguishers.  Report o -49, Existing WTP with ERP details.	Volume 3- Clause 52.18	DBOT	DBOE/PIU



WATER TREATMENT PLANT-1, 2 & 3 AMMINBHAVI (Pre-existing) P-4, P-5, P-6						
SCHEME COMPONENT →						
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
			Picture No 24  Fire Drill, Sprinklers system at HDPE stock			
16.	<ul style="list-style-type: none"> <li>Absence of Neutralization Pit &amp; Lifting Hoisting mechanism for lifting and lowering of Chlorine Tonners.</li> <li>Absence of Tools and Tackles for lifting and lowering of Chlorine Tonners</li> </ul>	<ul style="list-style-type: none"> <li>Construction of Neutralization pit</li> <li>EOT crane to be provided to handle the toner.</li> <li>Lifting Hoist Equipment to be planned for fixing in the Chlorination Storage shed.</li> <li>Spreader beam is to be arranged at the chlorine storage shed.</li> </ul>	Annexure  Report No-22 Sop for WTP O&M  Report 47 – chlorine tonner room with neutralization pit	ECoP: 10.0 Public and Worker's Health and Safety	DBOT	DBOE/PIU
17.	No Emergency Rescue Hook with insulation.	Already procured & provided at WTP site.	Annexure-  Picture No-29 Electrical safety compliances-O&M	ECoP: 10.0 Public and Worker's Health and Safety	DBOT	DBOE/PIU
18.	Absence of Clariflocculator sludge collecting sump.	Construction of sludge collecting sump & pumping system is planned in new WTP.	Annexure  Report 50 – 50.1 & 50.2 – Design drawings of piping system GA of Clariflocculator  Report 51 – sludge sump design drawing	ECoP-6.0 Waste Management	DBOT/DB OE	PIU
19.	Absence of backwash water collection tank & pumping system	Construction of a new backwash collection tank & pumping system is planned under new WTP.	Annexure  Report – 52 – Design drawing of back wash collecting sump	ECoP-6.0 Waste Management	DBOT/DB OE	PIU
20.	Absence of Sludge waste disposal and management	Construction of New sludge drying Bed and disposal of sludge as per PCB norms.  Sludge Outlet of existing 3 No's of WTP to be connected with the outlet of proposed 43 MLD WTP.  New WTP Construction is under progress which includes sludge drying beds.	Annexure  Report 67 – sludge drying bed design drawing	ECoP-6.0 Waste Management	DBOT/DB OE	PIU
SCHEME COMPONENT →		CLEAR WATER PUMPHOUSE FOR DHARWAD-AMMINBHAVI (Pre-existing) CLEAR WATER PUMPHOUSE FOR HUBLI-AMMINBHAVI (Pre-existing) P-7 to P-8				
N	Environmental / Social	Suggested Mitigation	Details in Annex-No.	Contract	Responsibility	

o.	Issue	Measure(s)		clause ref	Execution	Monitoring
1.	Insufficient no of Fire Extinguishers	<ul style="list-style-type: none"> <li>Provision for Fire extinguishers to improve fire safety at the site is to be ensured</li> </ul>	Annexure Report No-4 – List of Fire extinguisher available type & Inspection details	Volume 3 Clause 52.18 Schedule 10 B	DBOT	DBOE/PIU
2.	Opening at Floors without any Cover / Checker Plate	<ul style="list-style-type: none"> <li>Replacement of Items / Major Maintenance is considered in IIP</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
3.	Electrical Safety procedures like safety rubber mats, first-aid box, gloves, fire extinguishers, shock treatment charts & danger boards are not provided.	<ul style="list-style-type: none"> <li>PPEs like Red safety helmets, insulated safety shoes, electrical gloves, Usage of MCCB, RCCB, etc. are to be provided.</li> <li>List is as per Annexure.</li> </ul>	Annexure Report 53 – List of PPEs provided. Report 53.A - PPE stock at Project site	Volume 3 Clause 52. Schedule 10 B	DBOT	DBOE/PIU

SCHEME COMPONENT →		Raw Water Pumping Station-1 for Dharwad, SAVDATTI (Pre-existing) RAW WATER PUMPING STATION 2 FOR HUBLI-SAVDATTI (Pre-existing) P-9 to P-10				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Emergency Lights are not available in Raw water pumping stations.	Fixing of Lights, Details are submitted in IIP.	Annexure Report 54 - IIP	Volume 3 Clause 52. 16 Schedule 10 B	DBOT	DBOE/PIU
2.	Fire extinguishers are in damaged Condition	Replacement of Fire Extinguisher	Annexure- Picture No-4 Fire safety measures Report No-4 Type of fire extinguishers & Checklist.	Volume 3 Clause 52. 18 Schedule 10 B	DBOT	DBOE/PIU
3.	Absence of guard room, lockers, drinking water, and toilet facilities for staff (6 per shift)	Provide guard room with toilet, and lockers and make drinking water arrangements  The design of the guard room with the above-mentioned facilities is yet to be finalized.	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
4.	EOT Cranes/ Over Head Hoisting Equipment not having valid Third-Party Inspection Report and without proper maintenance	Every month there is an EHS inspection of EOT cranes. Once a year Third-Party Inspection is to be carried Out.	Annexure Report 55 – SOP for EOT crane	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

5.	No Cover slabs in the valve chambers	Cover slabs are to be provided, and details are submitted in IIP	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
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	SCHEME COMPONENT ➔	RAW WATER TRANSMISSION MAIN, SAVADATTI TO AMMINBHAVI WTP(CHAINAGE 0 TO CHAINAGE 29510) (NEW CONSTRUCTION) P-11				
No.	ESHS Issues	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
CH 0-29510 (Total Length 29KM, Dia.: 1219 mm)						
1.	Alignment running through villages Hireulligeri, Ennamongala, Harobelavadi, and Amminbhavi creating temporary disturbance to villagers & Farmers	Stakeholder consultation & community meetings. Crop compensation before starting the activity.	Annexure Report 14, Consultation & outreach action plan. Report-43, MOM Corporator orientation program Report 6 – SOP for traffic management	ECoP 13 : Consultation Framework	DBOT	DBOE
2.	Pollution due to improper management of excavated earth  Quantity of excavated earth: 130660.3 Cum  Quantity of backfill: 96215.54 Cum  Quantity of Surplus: 34444.73 Cum	<ul style="list-style-type: none"><li>• Prepare Excavated Earthwork Soil Storage and Disposal Management Plan.</li><li>• Prepare Topsoil Management Plan.</li><li>• Surplus soil will be deposited at designated locations.</li><li>• Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li></ul>	Annexure  Report - 27, Topsoil Management  Report -7, Dumping yard location for surplus soil	ECoP-14.0 Soil Management  ECoP. 11.0 Road, Transport and Road Traffic Management.	DBOT	DBOE/PIU
3.	Monitoring of Environmental Parameters (air, noise, etc.)	Establishing a baseline for every working location.	Annexures  Report – 29, Environmental Monitoring  Report No-31 Baseline Report.	ESA Report  8.4.1 Monitoring Indicators  Table 8.2: Environmental Monitoring Indicator	DBOT	DBOE/PIU
4.	Rest area required for labor gangs	Rest area to be provided at all the locations.	Annexure  Picture No-37 Rest shelters  Report 56 –WTP site layout  Report 58 - workforce management Centre plan	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
5.	ROW for the work site	ULB/KUIDFC ensures encumbrance-free work site	Annexure  Report 57, ROW details		PIU/DBOE	
6.	While Existing utility services such as Electricity, Telephone, water, and other service utilities may unfortunately be damaged &	<ul style="list-style-type: none"><li>• Prior intimation to the service providers</li><li>• Joint Inspection to be done</li></ul>	Annexure Report 61 – 61A & 61B – Utilities along the alignment of CWTM and RWTM respectively.	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

	rectification of damaged utilities would be completed by the end of the same day.					
7.	Temporary Disruption of traffic flow in the areas especially Harobelavadi, Hireulligere, Ennamongal & Amminbhavi villages	<ul style="list-style-type: none"> <li>• Prior intimation to the concerned Gram Panchayats, Roadside Shops, and Residents</li> <li>• Traffic Management Plan and implementation.</li> <li>• Letter to concerned Dept.</li> </ul>	Annexure-  Report No-6, SOP for Traffic Management Plan  Report 59 - Sample of Approved traffic diversion and management plan	ECoP- 11.0 Road, Transport and Road Traffic Management	SO/DBOT	DBOE/PIU
8.	Temporary Impact on livelihood during implementation	<ul style="list-style-type: none"> <li>• Conducting consultations with street vendors and shop owners.</li> <li>• Prior intimation to the street vendors and shop owners</li> <li>• Distribution of EHS templates</li> </ul>	Annexure- Report-14, Consultation & outreach action plan,  Annexure-Report-43, MOM Corporator orientation program	ECoP 13 : Consultation Framework	DBOT	DBOE/PIU
9.	Disruption of Fertile Topsoil of the Agriculture Land along the alignment	<ul style="list-style-type: none"> <li>• Proper plan for stacking of topsoil to be done</li> <li>• Proper restoration of topsoil to be done after pipe laying</li> </ul>	Annexure-  Report No-27, Topsoil Management Plan	ECoP-14.0 Soil Management	DBOT	DBOE/PIU
10.	Loss of standing crops during pipe laying and breakdown of the transmission main.	<ul style="list-style-type: none"> <li>• Prior intimation to the farmers</li> <li>• Conducting consultations with farmers</li> <li>• RP to be prepared as per RPF for the Compensation.</li> <li>• Corrective Action Plan to be prepared.</li> </ul>	N/A	ESA-Document  8.3 Environmental Management Plan	PIU	PMU
11.	Temporary Disruption of approach roads to agricultural land during implementation	<ul style="list-style-type: none"> <li>• Proper road restoration plan to be prepared and implement</li> </ul>	Annexure  Report No-20, Road Restoration.	Volume-1, Schedule-2, Obligation of the Operator	DBOT	DBOE/PIU
12.	Village encroachment at hireulligere, amminbhavi, ennamongal & harobelavadi	<ul style="list-style-type: none"> <li>• Prior intimation to encroachers</li> </ul>	Annexure Report 61 – 61A & 61B – Utilities along the alignment of CWTM and RWTM respectively		PIU/DBOT	DBOE

SCHEME COMPONENT →		CLEAR WATER TRANSMISSION MAIN, AMMINBHAVI WTP TO RAYAPUR(CHAINAGE 0 TO CHAINAGE 17712-1219mm Dia.) (864mm dia.-4749Rm)(762 mm dia.-10749Rmtr.).-(NEW CONSTRUCTION) P-12				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	<ul style="list-style-type: none"> <li>• Space constraint during pipelaying.</li> <li>• Laying of pipelines in city areas etc.</li> <li>• It will cause Limited access to shops, and street vendors, and temporary disturbances for the public.</li> </ul>	<ul style="list-style-type: none"> <li>• Alternative road diversion to be provided.</li> <li>• Prior Intimation of Work execution to Shops and Street Vendors.</li> <li>• Adequate provision for space shall be left so that the pedestrians have access to shops and Street Vendors.</li> <li>• Pedestrian walkway to be provided.</li> </ul>	Annexure  Report No-14 Consultation & outreach action plan.  Report-43, MOM Corporator orientation program  Report 59 – Approved	ECoP 13 : Consultation Framework	DBOT	DBOE/PIU

			traffic diversion and management plan			
2.	<ul style="list-style-type: none"> <li>Project alignment falls in forest area Chainage 17380-17620(1219mm MS Dia.-0.0535 Hectares)</li> <li>Chainage 0 to 520(864 mm MS Dia.-0.0919 Hectares)</li> <li>(762mm MS dia.-0.0343 Hectares)</li> </ul>	<ul style="list-style-type: none"> <li>Obtain Forest Clearance/NOC</li> <li>Comply with Forest Department conditions</li> </ul>	<p>Annexure</p> <p>Report No- 17&amp; 17A Tree compensation plan &amp; Forest clearance request letter</p> <p>Report 60 –Progress under Resettlement plan for CWTM and RWTM respectively.</p> <p>Report 64 – Forest permission for stage 1</p>	<p>ESA Report 3.7- Legal Approvals / Clearances Required</p> <p>ECOP 2.0: Site Preparation</p>	PIU/CCB	PMU
3.	<ul style="list-style-type: none"> <li>Disruption of Utilities such as electricity, telephone, and other services.</li> <li>It will cause disturbance to service providers and the Public.</li> </ul>	<ul style="list-style-type: none"> <li>Pre-communicate to concerned Service Providers, Joint Inspections/Visits,</li> <li>Finding UG utilities by using UG utility Detectors and or Trial Pits.</li> </ul>	N/A	ECOP-2 Site Preparation	DBOT	DBOE/PIU
4.	<ul style="list-style-type: none"> <li>Temporary Disruption of traffic flow during Pipe-laying activity</li> </ul>	<ul style="list-style-type: none"> <li>Traffic Permission from the Police Department.</li> <li>Traffic Management Plan.</li> <li>Prior intimation of the construction schedule to the people in the areas of construction</li> </ul>	<p>Annexure-</p> <p>Report No-6,SOP for Traffic Management Plan</p> <p>Report 59 Approved traffic diversion and management plan</p>	ECOP 11.0 Road Transport and Road Traffic Management	PIU/DBOT	DBOE/PM U
5.	<ul style="list-style-type: none"> <li>Laying of Pipelines in Sensitive Locations like Schools, Hospitals &amp; Temples, etc.</li> <li>There will be Temporary disruption to the movement of vehicles and students / Teachers.</li> <li>The medical services will face problems in terms of transportation of patients, visits by patient parties, and handling emergencies.</li> <li>Disruption of water supply to hospitals during implementation</li> </ul>	<ul style="list-style-type: none"> <li>Communication Protocol to be prepared and implemented for creating awareness, in Schools, Colleges, Hospitals, and Other Institutions.</li> <li>Limit hours of operation in sensitive zones during peak service hours.</li> <li>Alternate supply arrangements through supply through tankers should be provided if Leak, Contamination, and shortage of Water.</li> <li>Barricades and signboards intimating the temporary nature of inconvenience.</li> <li>Night works to be practiced to avoid inconvenience to the public.</li> </ul>	<p>Annexure-Report No-14,</p> <p>Consultation &amp; outreach action plan</p> <p>Annexure-Report-43, MOM Corporator orientation program</p> <p>Report 60 – 60A &amp; 60B – Resettlement plan for CWTM and RWTM respectively</p>	ECOP 3.0: Construction Camps Management	DBOT	DBOE/PIU
6.	<ul style="list-style-type: none"> <li>ROW for the work site</li> </ul>	The project authority to provide an encumbrance-free work site	<p>Annexure</p> <p>Report 57, ROW details</p>		PIU	DBOE
7.	<ul style="list-style-type: none"> <li>Failure to do Road Restoration, and uneven dug surface/ settlement area will have the possibility of accidents for Road users.</li> </ul>	<ul style="list-style-type: none"> <li>Road Restoration Plan to be prepared</li> </ul>	<p>Annexure-</p> <p>Report-20 Road Restoration Plan</p>	Volume-1, Schedule-2, Obligation of the Operator	DBOT	DBOE/PM U

8.	<ul style="list-style-type: none"> <li>Damage of Structures or Utilities during Implementation</li> </ul>	<ul style="list-style-type: none"> <li>RP is prepared as per RPF for the Compensation.</li> <li>Corrective Action Plan is prepared. Details are given separately as an annexure.</li> </ul>	<p>Annexure- Report No-14, Consultation &amp; outreach action plan</p> <p>Report No .65 Crop Compensation Beneficiary Details at CWTM and RWTM</p> <p>Report 60 – Report 60 – Progress under Resettlement plan for CWTM and RWTM respectively.</p>	ECOP 13 : Consultation Framework	PIU/DBOT	DBOE/PMU
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SCHEME COMPONENT →		DI PIPELAYING OF 102 KM at HUBLI & DHARWAD (NEW CONSTRUCTION) & HDPE PIPELAYING OF 2493 KM at HUBLI & DHARWAD (NEW CONSTRUCTION) P-13 & P-14				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	<ul style="list-style-type: none"> <li>Project alignment falls in forest area</li> <li>DI-250 mm dia. (0.0151 hectares)</li> </ul>	<ul style="list-style-type: none"> <li>Obtain Forest Clearance/NOC</li> <li>Comply with Forest Department conditions</li> </ul>	<p>Annexure</p> <p>Report No- 17 &amp; 17A Tree compensation plan &amp; Forest clearance request letter</p> <p>Report no.64 – Forest Permission for stage 1</p>	<p>ESA Report 3.7- Legal Approvals / Clearances Required</p> <p>ECOP 2.0: Site Preparation</p>	PIU/CCB	PMU
2.	Temporary Impact on existing utility services such as Electricity, Telephone, and other services.	<ul style="list-style-type: none"> <li>Prior intimation to the service providers</li> <li>Joint Inspection to be planned</li> <li>Avoiding/Shifting of Utilities</li> </ul>	<p>Annexure</p> <p>Report No 30, SOP for HDPE Pipelines laying.</p>	ECOP 10.0 Public and Workers Health and Safety	PIU/DBOT	DBOE
3.	Temporary disruption of traffic flow in the city especially in Commercial and High-Density areas.	<ul style="list-style-type: none"> <li>Prior intimation to the Traffic Police Station and obtaining permission</li> <li>Prior intimation to the Street Vendors, Shops owners, and Residents</li> <li>Traffic Management Plan to be prepared and implement</li> <li>Distribution of EHS templates</li> </ul>	Annexure- Report No- 6, Traffic Management Plan	ECOP 11.0 Road Transport and Road Traffic Management	PIU/DBOT	DBOE
4.	Temporary Impact on livelihood during implementation	<ul style="list-style-type: none"> <li>Conducting consultations with street vendors and shop owners.</li> <li>Prior intimation of work schedule to the street vendors and shop owners</li> <li>Distribution of EHS templates</li> </ul>	<p>Annexure-Report No-14, Consultation &amp; Outreach action plan</p> <p>Annexure-Report-43, MOM Corporator orientation program</p>	ECOP 13 : Consultation Framework	PIU/DBOT	DBOE
5.	ROW for the work site	The project authority to provide an encumbrance-free work site	N/A		PIU	DBOE
6.	Temporary disruption of water supply to the consumers during implementation	<ul style="list-style-type: none"> <li>Prior intimation to the public on the disruption of water supply through print and electronic media</li> <li>Alternative water supply arrangement plans to be prepared and implement</li> </ul>	N/A	ECOP 13 : Consultation Framework	DBOT	DBOE/PIU

7.	Damage of Structures or Utilities during Implementation	<ul style="list-style-type: none"> <li>• RP has been approved.</li> </ul>	Annexure Report 60 – 60A & 60B –Progress under Resettlement plan for CWTM and RWTM respectively.	ECOP 13 : Consultation Framework	DBOT	DBOE/PIU
8.	Temporary disruption to the movement of vehicles in sensitive areas such as Schools, Hospitals, Institutions, Religious Places	<ul style="list-style-type: none"> <li>• Prior intimation to the School, Hospital, Institutions, Religious Places</li> <li>• Conducting consultations with Schools, Hospital, Institutions, Religious Places</li> <li>• Priority work planning in a sensitive location</li> <li>• Limit hours of operation in sensitive areas</li> <li>• Install signage's</li> <li>• Hoardings and signboards intimating the temporary nature of the inconvenience</li> <li>• Barricades, temporary noise control measures, and dust suppression measures through watering</li> <li>• Proper road restoration plan to be prepared and implement</li> </ul>	<p>Annexure- Report-14, Communication Action Plan.</p> <p>Report No-28, Alternate arrangement for water supply disruption.</p>	ECOP 13: Consultation Framework	PIU/DBOT	DBOE
9.	Disturbing the Public access during Pipe Laying cause slip trip and Fall	<ul style="list-style-type: none"> <li>• Provide safe access and Egress.</li> <li>• Providing Walking ways with Handrails</li> <li>• Barricades and safety Signage</li> </ul>	Annexure- Report No-35,SOP For Excavation & MS Pipe Laying Works- Picture -39	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
10.	Excavated Earth stack distrub to Public and pollution	<ul style="list-style-type: none"> <li>• Soil is to be backfilled after being laid at pipe the end of the day.</li> <li>• Excess soils are to be shifted to an Identified location</li> </ul>	Annexure – Report No-7 & 8,Soil dumping in approved location	ECOP-14.0 Soil Management	DBOT	DBOE/PIU
11.	Non-Identifying tools & tackles for Manual excavation & Unplanned material handling may cause issues for workers & public	<ul style="list-style-type: none"> <li>• Providing insulated crow bars &amp; spades to digging workmen.</li> <li>• Inspection of Tools &amp; tackles before taking them into use.</li> </ul>	Annexure- Report No-35,SOP For Excavation & MS Pipe Laying Works	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
12.	Rolling of pipes on the road	<ul style="list-style-type: none"> <li>• Providing stoppers for every pipe</li> <li>• Pipe should be stacked nearby pipe yards for easy handling</li> <li>• Avoid stacking of pipes near roads as much as possible to avoid such incidents.</li> </ul>	<p>Annexure- Report No-35,SOP For Excavation &amp; MS Pipe Laying Works</p> <p>Report no.33 SOP for DI pipe laying</p>	ECOP 10.0 Public and Workers Health and Safety		
<b>SCHEME COMPONENT → HOUSE SERVICE CONNECTION OF 145700 No's (NEW CONSTRUCTION) P-15</b>						
No.	Environmental /	Suggested Mitigation	Details in Annex-No.	Contract clause ref	Responsibility	



	Social Issue	Measure(s)			Execution	Monitoring
1.	Damage to underground utilities	<ul style="list-style-type: none"> <li>Prior Intimation to concerned service providers such as Mega Gas, BSNL, Airtel, Telephone Department, Drainage, and Site Inspection.</li> <li>Using UG detector to detect equipment, Trial Pit.</li> <li>Excavation work permit.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBoE/PIU
2.	Disturbing the Public by making Road cutting activity	<p>Prior permission from a concerned authority such as Smart City, City Corporation, Hubli Dharwad Urban Development Authority, Cantonment</p> <p>Our NGO Representatives are continuously doing street-level awareness program sessions for the public (frequently).</p> <p>Palpate covering project info is distributed to the public</p>	<p>Annexure</p> <p>Report 59 – Approved traffic diversion and management plan</p>	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBoE/PIU
3.	Other service providers are damaging Water supply lines, due to this reason, disruption of water supply in that area	<ul style="list-style-type: none"> <li>Joint Inspection before work start.</li> <li>Fixing the problem by the concerned department on priority.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety		
4.	Inconvenience to the public, unsafe access because of the trenching activity	<ul style="list-style-type: none"> <li>Safe walkingway access.</li> <li>Barricades and signages</li> <li>Regular Site supervision by an engineer</li> </ul>	<p>Annexure</p> <p>Picture -6, Traffic management plan for barricades and signages</p> <p>Picture -39, walkway paths provided for temporary purpose for safe access and egress.</p>	Volume-1, Schedule-2, Obligation of the Operator	DBOT	DBoE/PIU
5.	Non-restoration of the road after the completion of works would cause inconvenience to the public.	<ul style="list-style-type: none"> <li>Road to be restored to its original condition immediately after laying of pipes/ valves etc., as per Restoration Plan/procedure.</li> </ul>	Annexure- Report No-20, Road Restoration Procedure	Volume-1, Schedule-2, Obligation of the Operator	DBOT	DBoE/PIU

## SCHEME COMPONENT →

GLSR 1 (D-PIP1) DC Compound (Pre-existing)  
 GLSR 2 DC Compound (Pre-existing)  
 GLSR 3 (D-PIP1) DC Compound (Pre-existing) P-16, P-17, P-18.

No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	<ul style="list-style-type: none"> <li>Snakebite</li> </ul>	<ul style="list-style-type: none"> <li>Bush/grass cutting in access pathways</li> <li>Leg guards for valve operators</li> <li>Rush the victim to hospital in case of snake bite.</li> </ul>	Picture No-3  Snake prevention measures.	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
2.	<ul style="list-style-type: none"> <li>Chambers (valve chambers/scour valve chambers) are not barricaded and covered by slab,</li> <li>Man, the entry point is not covered properly,</li> <li>Open chambers Exposed to trespassers like children are playing and have chances to climb in the case</li> <li>Lack of Lightings</li> <li>Increased vegetation</li> </ul>	<ul style="list-style-type: none"> <li>Valve chambers are to be covered with pre-cast blocks.</li> <li>Periodic maintenance of an entry point and signage boards are to be place near the entry point.</li> <li>Bush cutting machine to clear the dense bushes to avoid any animal/insect/snake hazards.</li> <li>Portable torches are to be provided to a workforce where the illumination level is less than required in the chambers.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		ELSR (D-P1P1) DC compound (New construction) P-19				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Accumulation of Construction and Earth material waste.	<ul style="list-style-type: none"> <li>Identification of designated locations of excess soil disposal.</li> <li>The soil Dumping yard identified is Navbharat, Education, plantation farmers society ,Shalmala nagar, kalhtagi road Dharwad&amp; unkal old WTP premises</li> </ul>	Annexure  Reports No- 7 & 8  Soil Dumping Location and Map	ECoP-Soil Management  ECoP-Waste Management	DBOT	DBOE/PIU
2.	Requirement of Water sources for construction works/Proper drainage for rainwater/Fencing	<ul style="list-style-type: none"> <li>Water Sources for Construction works: A) Water from approved sources like bore wells or ELSR/GLSR Structures. B) Water Source for Concreting works by RMC Vendors (Private agencies with their own source)</li> <li>will be planned and arranged from Private Agency.</li> <li>Tanks Capacity 2000 to 2500 Liters Sintex Tank.</li> <li>Water quantity required – 2000 lit/day/structure</li> </ul>	Annexure  Report 48 – temporary water source	ECOP 5.0: WATER RESOURCES MANAGEMENT	DBOT/PIU	DBOE/PMU
3.	Proper Siting and Location of construction camps	<ul style="list-style-type: none"> <li>Labour Camp/Rented house/bunker beds to be established as per Labour Management Plan.</li> </ul>	Annexure – Report-10  Labour Management Plan  Report 58 – workforce management center plan  Picture No-08, Labour	ECOP- Construction Camp Management	DBOT	DBOE/PIU

			Management Implementation			
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SCHEME COMPONENT →		ELSR (D-PIP2) Gulganjikoppa (Pre-existing), GLSR (D-P1P2) Gulganjikoppa (Pre-existing), ELSR IIIT Dharward Ext. (Pre-existing), ELSR Kalyan Nagar (Pre-existing), ELSR (D-Demo) Maddarmaddi (Pre-existing), GLSR (D-Demo) Maddarmaddi (Pre-existing), ELSR Mrityunjaya Nagar (Pre-existing), ELSR Navalur Ext (Pre-existing), ELSR Niduvani Layout (Pre-existing), ELSR Police headquarters (Pre-existing) P-20 to P-30				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	<b>All above-mentioned GLSR's except Maddarmaddi:</b> <ul style="list-style-type: none"> <li>Barricading - Chambers are not barricaded and covered by slabs,</li> <li>Man cover - Man, the entry point is not covered properly,</li> <li>Open chambers are left without barricading and the probability of trespassing like children playing in surrounding areas may be curious and chances to climb the staircase.</li> <li>Lack of ample amount of illumination</li> <li>Increased vegetation</li> </ul>	<ul style="list-style-type: none"> <li>Based on the NDT Test, Rehabilitation Plan / Major maintenance to be considered in IIP</li> <li>Valve chambers are to be covered with pre-cast blocks.</li> <li>Periodic maintenance of man entry point and signage boards are to be placed near the entry point.</li> <li>Bush cutting machine to clear the dense bushes to avoid any animal/insect/snake hazards.</li> <li>Portable torches are to be provided to a workforce where the illumination level is less than required in the chambers</li> </ul>	Annexure Report -62 Sop for demolition	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
2.	<b>For ELSR Structures mentioned:</b> <ul style="list-style-type: none"> <li>Unsafe Access &amp; egress - Absence of Handrails.</li> <li>The Cover slab of the valve chamber is missing.</li> <li>Landing Platforms are not in good conditions</li> <li>Unsafe electrical connections and without safety measures.</li> <li>Lack of Lightings</li> <li>Increased vegetation</li> </ul>	<ul style="list-style-type: none"> <li>Based on the NDT Test, Rehabilitation Plan / Major maintenance is to be considered in IIP.</li> <li>Bush cutting machine to be used to remove the weed growth, as dense bushes can be habitat to snakes/insects.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
3.	<b>Maddarmaddi GLSR</b>  Damaged slab	<ul style="list-style-type: none"> <li>Based on NDT Test, Rehabilitation Plan / Major maintenance to be proposed for demolition &amp; to be reconstructed.</li> <li>The Slab needs to be rectified immediately.</li> <li>Movement of workers nearby area to be avoided.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		ELSR Gulganjikoppa (New construction), GLSR Navalur (New construction), GLSR Udaigiri (New construction), GLSR Yettingudda (New construction), ELSR Kelgiri Tapovan (New construction), ELSR Karnataka University (New construction), ELSR Lakhamanahalli (New construction) P-31 to P-37				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	

					Execution	Monitoring
1	Proper Security at the site to avoid Trespassers.	<ul style="list-style-type: none"> <li>Site Fencing is to be planned to avoid any trespassers inside the site.</li> <li>Site Security and access control.</li> <li>Adequate fencing/Boundary wall to be ensured.</li> <li>Restricted entry is ensured by security and entry register is available at entrance Gate</li> <li>CCTV facilities, Display of signage boards in vernacular language is ensured.</li> </ul>	Annexure  Report No- 63 Fencing details design drawing	ECOP-Site Preparation	DBOT	DBOE/PIU
2	All above Sites are located in close vicinity to residential areas and during construction time, Traffic congestions will arise.	<p>Undertake consultations as per the Communication Protocol.</p> <p>The Traffic management plan is in place.</p>	<p>Annexure</p> <p>Report No-6 Traffic management plan</p> <p>Picture -40, Work in Residential areas, provided barricades.</p>	ECOP 13.0 Consultation Framework	DBOT	DBOE/PIU
3	Accumulation of construction and Earth material waste and its disposal to avoid inconvenience to the public.	<ul style="list-style-type: none"> <li>Identification of designated locations of excess soil disposal.</li> <li>The Soil Dumping yard identified is Navbharat, Education, plantation farmers society, Shalmala nagar, kalghtagi road Dharwad &amp; unkal old WTP premises</li> </ul>	<p>Annexure</p> <p>Reports No- 7 &amp; 8</p> <p>Soil Dumping Location and Map.</p>	ECOP-14 Soil Management	PIU	DBOE
4	Requirement of Water sources for construction works.	<ul style="list-style-type: none"> <li>Water Sources for Construction works: A) Water from approved sources like bore wells or ELSR/GLSR Structures. B) Water Source for Concreting works by RMC Vendors (Private agencies with their own source)</li> <li>will be planned and arranged from Private Agency.</li> <li>Tanks Capacity 2000 to 2500 Liters Sintex Tank.</li> <li>Water quantity required – 2000 lit/day/structure</li> </ul>	N/A	ECOP 5.0: Water for Construction	DBOT	DBOE/PIU

SCHEME COMPONENT →		ELSR Rajaji Nagar Ext. (Pre-existing), GLSR Rajathgiri (Pre-existing), ELSR Sanmathinagar (Pre-existing), P-38 To P-40				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	<p>GLSR Rajathgiri:</p> <ul style="list-style-type: none"> <li>Barricading - Chambers are not barricaded and covered by slab,</li> <li>Damaged Slabs</li> <li>Manhole cover - Man, the entry point is not covered properly,</li> <li>Open chambers Exposed to trespassers like children are playing and have chances to climb in staircase</li> <li>Lack of Lightings</li> <li>Increased vegetation</li> </ul>	<ul style="list-style-type: none"> <li>Replacement of Items / Major Maintenance to be considered in IIP</li> <li>Based on the NDT Test, Rehabilitation Plan / Major maintenance to be considered in IIP</li> <li>Bush cutting machine to be used to avoid dense bushes.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

2.	ELSR Rajaji nagar Ext. & Sanmathi nagar: a. Absence of Handrails. b. The Cover slab of the valve chamber is missing. c. Unsafe electrical connections and without safety measures. d. Lack of Lightings e. Increased vegetation	<ul style="list-style-type: none"> <li>Based on the NDT Test, Rehabilitation Plan / Major maintenance to be considered in IIP</li> <li>Bush cutting machine to be used to remove the grass to avoid animal/insects/ snake related mishappenings</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
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SCHEME COMPONENT →		ELSR (D-PIP2) Saraswathipura (New construction) P-41				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Accumulation of Construction and Earth material waste.	<ul style="list-style-type: none"> <li>Identification of designated locations of excess soil disposal &amp; immediate removal of excess earth.</li> <li>The Soil Dumping yard identified is Navbharat, Education, plantation farmers society, Shalmalanagar, kalghtagi road Dharwad &amp; unkal old WTP premises</li> </ul>	Annexure  Reports No- 7 & 8  Soil Dumping Location and Map	ECOP-Soil Management  ECOP-Waste Management	DBOT	DBOE/PIU
2.	Requirement of Water sources for construction works.	<ul style="list-style-type: none"> <li>Water Sources for Construction works: A) Water from approved sources like bore wells or ELSR/GLSR Structures. B) Water Source for Concreting works by RMC Vendors (Private agencies with their own source) will be planned and arranged from Private Agency.</li> <li>Tanks Capacity 2000 to 2500 Liters Sintex Tank.</li> <li>Water quantity required – 2000 lit/day/structure</li> </ul>	N/A	ECOP 5.0: WATER RESOURCES MANAGEMENT	DBOT/PIU	DBOE/PMU
3.	Proper Siting and Location of construction camps	<ul style="list-style-type: none"> <li>Labour Camp/Rented house to be established.</li> <li>Should follow Labour Management Plan.</li> </ul>	Annexure  Report-10- Labour Management Plan  Picture No-08, Labour Management Implementation  Report – 58 – workforce management centre plan.	ECOP- Construction Camp Management	DBOT	DBOE/PIU

SCHEME COMPONENT → ELSR (D-PIP2) Saraswathpura-Demolition (Pre-existing to be de-commissioned) P-42						
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Accumulation of Construction and Earth material waste.	<ul style="list-style-type: none"> <li>Identification of designated locations of excess soil disposal. This will avoid space constraints during construction.</li> <li>The Soil Dumping yard identified is Navbharat, Education, plantation farmers society, Shalmala nagar, kalghatagi road Dharwad &amp; unkal old WTP premises</li> </ul>	Annexure Report No-08, Soil Dumping Location	ECOP 3.0: Construction Camps Management	DBOT	DBOE/PIU
2.	Requirement of Water sources for construction works.	<ul style="list-style-type: none"> <li>Water Sources for Construction works: A) Water from approved sources like bore wells or ELSR/GLSR Structures. B) Water Source for Concreting works by RMC Vendors (Private agencies with their own source) will be planned and arranged from Private Agency.</li> <li>Tanks Capacity 2000 to 2500 Liters Sintex Tank.</li> <li>Water quantity required – 2000 lit/day/structure</li> </ul>	N/A	ECOP 14.0: Soil Management	DBOT	DBOE/PIU
3.	Proper Siting and Location of construction camps	<ul style="list-style-type: none"> <li>Labour Camp/Rented house/Bunkbeds to be provided as per Labour Management Plan.</li> </ul>	Annexure – Report No-10, Labour Management Plan	ECOP 3.0: Construction Camps Management	DBOT	DBOE/PIU
4.	Safe Demolition of ELSR	<ul style="list-style-type: none"> <li>Demolition methodology with safe precautionary measures is finalized.</li> </ul>	Annexure Report – 62, SOP for Demolition	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT → GLSR (D-PIP2) Saraswathpura (Pre-existing), ELSR Shambhavinagar (Pre-existing), ELSR Tadsin Koppa 1 (Pre-existing), ELSR Tadsin Koppa 2 (Pre-existing) P-43 To P-46						
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	GLSR Saraswathpur: <ul style="list-style-type: none"> <li>Damaged slab</li> <li>Barricading - Chambers are not barricaded and covered by slabs,</li> <li>Manhole covers - Man, the entry point is not covered properly,</li> <li>Open chambers Exposed to trespassers like children are playing and have chances to climb in staircase</li> <li>Lack of Lightings</li> <li>Increased vegetation</li> </ul>	<ul style="list-style-type: none"> <li>Based on NDT Test, Rehabilitation Plan / Major maintenance to be proposed for demolition &amp; to be reconstructed.</li> <li>The Slab needs to be rectified immediately.</li> <li>Movement of workers nearby area to be avoided.</li> <li>Bush cutting machine to be used.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

2.	ELSR Shambhavi nagar, Tadsinkoppa-1 & 2:	<ul style="list-style-type: none"> <li>Based on the NDT Test, the Rehabilitation Plan / Major maintenance to be considered in IIP</li> <li>Bush cutting machine to be used to remove the grass dense bushes to avoid animal/insects/snake mishappenings.</li> </ul>	N/	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
	<ul style="list-style-type: none"> <li>Absence of Handrails.</li> <li>The Cover slab of the valve chamber is missing.</li> <li>Unsafe electrical connections and without safety measures.</li> <li>Lack of Lightings</li> <li>Increased vegetation</li> </ul>					

SCHEME COMPONENT →		GLSR Tarihal (New construction) P-47				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Insufficient Fencing can cause public interference in the site working zone.	Sites are Completely Fenced, and Display of caution Boards is ensured.	Annexure Report No- 63 Fencing details design drawing	ECOP 3.0: Construction Camps Management	DBOT	DBOE/PIU
2.	The Site mainly consists of residential areas, and Narrow Roads. Traffic congestion on narrow roads will occur.	Undertake consultations as per the Communication Action Plan.  Should follow Traffic management plan	Annexure – Report No-14, Communication Action Plan  Report 6 - Traffic management	CoP 13 : Consultation Framework	DBOT	DBOE/PIU
3.	Proper Siting and Location of construction camps	Labor Camp at respective ELSR to be planned and established.	Annexure-Report No-10, Labour Management Plan  Picture No-08, Labour Camp Implementation	ECOP 3.0: Construction Camps Management	DBOT	DBOE/PIU

SCHEME COMPONENT →		GLSR Tejasvi Nagar (Pre-existing), ELSR Vanashree Nagar 1(HDUDA) (Pre-existing), ELSR Vanashree Nagar 2(Temple Premises) (Pre-existing), ELSR Vanashree Nagar 3(Mother Teresa School) (Pre-existing), GLSR Yettingudda (AU) Ext. (Pre-existing), GLSR Ayodhya Nagar Ext. (Pre-existing), ELSR (H-PIP1) Balaji Nagar (Pre-existing) P-48 To P-54				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	<b>Above mentioned GLSR Locations</b> <ul style="list-style-type: none"> <li>Barricading - Chambers are not barricaded and covered by slabs,</li> <li>Manhole cover - Man, the entry point is not covered properly,</li> <li>Open chambers Exposed to trespassers like children are playing and have chances to climb in staircase</li> <li>Lack of Lightings</li> <li>Increased vegetation</li> </ul>	<ul style="list-style-type: none"> <li>Based on the NDT Test, Rehabilitation Plan / Major maintenance to be considered in IIP</li> <li>Bush cutting machine to be used. to avoid dense bushes.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU



2.	<b>Above Mentioned ELSR locations</b> <ul style="list-style-type: none"> <li>Absence of Handrails.</li> <li>The Cover slab of the valve chamber is missing.</li> <li>Landing Platforms are not in good conditions</li> <li>Unsafe electrical connections and without safety measures.</li> <li>Lack of Lightings</li> <li>Increased vegetation</li> </ul>	<ul style="list-style-type: none"> <li>Based on the NDT Test, Rehabilitation Plan / Major maintenance is to be considered in IIP.</li> <li>Bush-cutting machine to be used to remove the grass/weeds.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
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SCHEME COMPONENT →		ELSR (H-P1P1) Balaji Nagar additional (New construction), ELSR Buddha Vihar (New construction) P-55 & P-56				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	The Absence of Fencing causes public interference in the site working zone.	Sites are Completely Fenced, and Display of caution Boards is ensured.	N/A	ECOP 3.0: Construction Camps Management	DBOT	DBOE/PIU
2.	The site mainly consists of residential areas, and Narrow Roads. Traffic congestion on narrow roads will occur.	Undertake consultations as per the Communication Action Plan.  Should follow Traffic management plan	Annexure – Report No-14, Communication Action Plan Report 6 - Traffic management plan	CoP 13 : Consultation Framework	DBOT	DBOE/PIU
3.	Accumulation of construction and Earth material waste disposal.	The Waste disposal site is identified at Balaji nagar & Budha vihar. The excess earth is being disposed of in designated location.	Annexure  Report No-7&8, Soil Dumping Location	ECOP-14.0 Soil Management	DBOT	DBOE/PIU
4.	Proper Siting and Location of construction camps	Labor Camp/bunk beds/Rented house at respective ELSR to be planned and established.	Annexure-Report No-10, Labour Management Plan  Picture No-08, Labour Camp Implementation	ECOP 3.0: Construction Camps Management	DBOT	DBOE/PIU

SCHEME COMPONENT →		GLSR Keshwapur Ext. (Pre-existing), ELSR Soniagandhi Ext. (Pre-existing) P-57 & P-58				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	<u>Keshavpur Ext. GLSR</u> <ul style="list-style-type: none"> <li>Barricading - Chambers are not barricaded and covered by slabs,</li> <li>Manhole cover - Man, the entry point is not covered properly,</li> <li>Open chambers Exposed to trespassers like children are playing and have</li> </ul>	<ul style="list-style-type: none"> <li>Based on the NDT Test, Rehabilitation Plan / Major maintenance to be considered in IIP</li> <li>Bush cutting machine to be used to remove unwanted weeds/bushes.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

	<ul style="list-style-type: none"> <li>chances to climb in staircase</li> <li>Lack of Lightings</li> <li>Increased vegetation</li> </ul>					
2.	<u>Soniagandhi ext. ELSR</u> <ul style="list-style-type: none"> <li>Unsafe access &amp; egress- Absence of Handrails.</li> <li>The Cover slab of the valve chamber is missing.</li> <li>Landing Platforms are not in good conditions</li> <li>Unsafe electrical connections and without safety measures.</li> <li>Lack of Lightings</li> <li>Increased vegetation</li> </ul>	<ul style="list-style-type: none"> <li>Based on the NDT Test, Rehabilitation Plan / Major maintenance is to be considered in IIP.</li> <li>Bush-cutting machine to be used to remove the grass.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		ELSR Bidnal Prop. (New construction), ELSR FCI Bhommapur (New construction) P-59&P-60				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	The Site is surrounded by Residential Areas and a Park located nearby, Construction activity will cause inconvenience to the public	Undertake consultations as per the Communication Action Plan.  Should follow Traffic management plan	Annexure, Report-14, Consultation & outreach Action plan. Annexure-Report-43, MOM Corporator orientation program	ECOP 13 : Consultation Framework	DBOT	DBOE/PIU
2.	Accumulation of construction and Earth material waste.	<ul style="list-style-type: none"> <li>The Waste dumping location is identified in Bidnal &amp; FCI bhommapur.</li> <li>The Soil Dumping yard identified is Navbharat, Education, plantation farmers society, Shalmala nagar, kalghtagi road Dharwad &amp; unkal old WTP premises.</li> </ul>	Annexure-Report 7 & 8, Soil Dumping Location.	ECOP-14.0 Soil Management	DBOT	DBOE/PIU
3.	Proper Siting and Location of construction camps	<ul style="list-style-type: none"> <li>Labor Camp to be planned at ELSR site premises as per Labour Management Plan.</li> </ul>	Annexure – Picture No-8,  Labour Camp Implementation  Report No-10, Labour Management Plan.	ECOP 3.0: Construction Camps Management	DBOT	DBOE/PIU

SCHEME COMPONENT →		ELSR (H-PIP2) Gabbur (Pre-existing) P-61				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	<ul style="list-style-type: none"> <li>Unsafe access &amp; egress- Absence of Handrails.</li> <li>The Cover slab of the valve chamber is missing.</li> </ul>	<ul style="list-style-type: none"> <li>Based on the NDT Test, Rehabilitation Plan / Major maintenance is to be considered in IIP.</li> </ul>	N/A	ECOP 10.0 Public and Workers	DBOT	DBOE/PIU

<ul style="list-style-type: none"> <li>Landing Platforms are not in good conditions</li> <li>Unsafe electrical connections and without safety measures.</li> <li>Lack of Lightings</li> <li>Increased vegetation</li> </ul>	<ul style="list-style-type: none"> <li>Bush-cutting machine to be used to remove the grass/ bushes.</li> </ul>		Health and Safety		
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SCHEME COMPONENT →		ELSR Gokul Village (New construction), GLSR Gowrishankar (New construction), GLSR (H-PIP1) HDMC additional (New construction) P-62 to P-64				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	The Site is surrounded by Residential Areas and Park located nearby, Construction activity will cause inconvenience to the public	Undertake consultations as per the Communication Action Plan.	Annexure, Report-14, Communication Plan	ECOP 13 : Consultation Framework	DBOT	DBoE/PIU
2.	Accumulation of construction and Earth material waste disposal.	<ul style="list-style-type: none"> <li>Approved Waste dumping location in Gokul village, Gowrishankar &amp; HDMC</li> <li>The Soil Dumping yard identified is Navbharat, Education, plantation farmers society, Shalmala nagar, kalghtagi road Dharwad &amp; unkal old WTP premises.</li> </ul>	Annexure-Report 7 & 8, Soil Dumping Location.	ECOP-14.0 Soil Management	DBOT	DBoE/PIU
3.	Proper Siting and Location of construction camps	<ul style="list-style-type: none"> <li>Labor Camp to be planned at Respective ELSR site premises.</li> <li>Labour Management Plan.</li> </ul>	Annexure – Picture No-8, Labour Camp Container.  Report No-10, Labour Management Plan.	ECOP 3.0: Construction Camps Management	DBOT	DBoE/PIU

SCHEME COMPONENT →		ELSR 1 HDMC (Pre-existing), ELSR 2 HDMC (Pre-existing), GLSR (H-PIP1) HDMC (Pre-existing), GLSR Karwar Road Ext (Pre-existing), ELSR Karwar Road Ext (Pre-existing) P-65 ToP-69				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	<ul style="list-style-type: none"> <li>Absence of Handrails.</li> <li>Cover slab of valve chamber is missing.</li> <li>Landing Platforms is not in good conditions</li> <li>Unsafe electrical connections and without safety measures.</li> <li>Lack of Lightings</li> <li>Increased vegetation</li> </ul>	<ul style="list-style-type: none"> <li>Replacement of Items / Major Maintenance to be considered in IIP</li> <li>Based on NDT Test, Rehabilitation Plan / Major maintenance to be considered in IIP.</li> <li>Bush cutting machine to be used to remove the grass/ bushes.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBoE/PIU

SCHEME COMPONENT →		ELSR Karwar Road(New construction) P-70				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring

1.	The Site is surrounded by Residential Areas and Park located nearby, Construction activity will cause inconvenience to public	Undertake consultations as per the Communication Action Plan.	Annexure, Report-14, Communication Plan	ECOP 13 : Consultation Framework	DBOT	DBOE/PIU
2.	Accumulation of construction and Earth material waste disposal.	<ul style="list-style-type: none"> <li>Approved Waste dumping location in Karwar road</li> <li>The Soil Dumping yard identified is Navbharat, Education, plantation farmers society, Shalmala nagar, kalghtagi road Dharwad &amp; unkal old WTP premises</li> </ul>	Annexure- Report 7 & 8, Soil Dumping Location.	ECOP-14.0 Soil Management	DBOT	DBOE/PIU
3.	Proper Siting and Location of construction camps	<ul style="list-style-type: none"> <li>Labor Camp to be planned at ELSR site premises.</li> <li>Labour Management Plan.</li> </ul>	Annexure – Picture No-8, Labour Management Implementations.  Report No-10, Labour Management Plan.	ECOP 3.0: Construction Camps Management	DBOT	DBOE/PIU

SCHEME COMPONENT →		ELSR (H-P1P2)Keshwapur Ext. (Pre-existing), GLSR Krishnapur Ext. (Pre-existing), ELSR (H-P1P2) Mahadevi layout (Pre-existing), ELSR Murarji Nagar Ext (Pre-existing), ELSR Nehru Nagar Ext. (pre-existing), ELSR- Nekar Nagar Ext.(Pre-existing), GLSR (H-P1P2)- NR Betta Circular (Pre-Existing), GLSR (H-Demo) NR Betta Demo (Pre-Existing), GLSR- NR Betta OLD (pre-existing), ELSR- SM Krishna Nagar Ext. (pre-existing), ELSR Sun City Ext.( pre-existing), ELSR (H-P1P1) Tabibland 1 (Pre-existing), ELSR (H-P1P1) Tabibland 2 (Pre-existing), ELSR Bharati Nagar (Pre-existing) (P-71, P-73, P-74, P-75, P-76, P-77, P-78, P-79, P-80, P-81, P-82, P-84, P-85, P-91)				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	<b>All above mentioned GLSR's</b> <ul style="list-style-type: none"> <li>Chambers are not barricaded and covered by slab,</li> <li>Man, entry point is not covered properly,</li> <li>Open chambers Exposed to trespassers like children are playing and have chances to climb in staircase</li> <li>Lack of Lightings</li> <li>Increased vegetation</li> </ul>	<ul style="list-style-type: none"> <li>Replacement of Items / Major Maintenance to be considered in IIP</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	
2.	<b>All above mentioned ELSR's</b> <ul style="list-style-type: none"> <li>Absence of Handrails.</li> <li>Cover slab of valve chamber is missing.</li> <li>Landing Platforms is not in good conditions</li> <li>Unsafe electrical connections and without safety measures.</li> <li>Lack of Lightings</li> <li>Increased vegetation</li> </ul>	<ul style="list-style-type: none"> <li>Replacement of Items / Major Maintenance to be considered in IIP</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		ELSR SUN CITY (NEW CONSTRUCTION) P-83			
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in	Contract	Responsibility

			Annex-No.	clause ref	Execution	Monitoring
1.	The Site is surrounded by Residential Areas and Park located nearby, Construction activity will cause inconvenience to public	Undertake consultations as per Communication Action Plan.	Annexure, Report-14, Communication Plan	ECOP 13 : Consultation Framework	DBOT	DBOE/PIU
2.	Accumulation of construction and Earth material waste and its disposal.	<ul style="list-style-type: none"> <li>Approved Waste dumping location in Sun city.</li> <li>Soil Dumping yard identified is Navbharat, Education, plantation farmers society, Shalmala nagar, kalghtagi road Dharwad &amp; unkal old WTP premises</li> </ul>	Annexure-Report 7 & 8, Soil Dumping Location.	ECOP-14.0 Soil Management	DBOT	DBOE/PIU
3.	Proper Siting and Location of construction camps	<ul style="list-style-type: none"> <li>Labor Camp to be planned at Sun city location site premises.</li> <li>Labour Management Plan.</li> </ul>	Annexure – Picture No-8, Labour Management Implementations. Report No-10, Labour Management Plan.	ECOP 3.0: Construction Camps Management	DBOT	DBOE/PIU

	SCHEME COMPONENT →	ELSR-APMC (NEW CONSTRUCTION), GLSR-APMC (New construction) & GLSR-Navanagar (New Construction) P-86 to P-88				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Site surrounded by Residential Areas and Park located nearby, Construction activity will cause inconvenience to public	Undertake consultations as per Communication Action Plan.	Annexure, Report-14, Communication Plan	ECOP 13 : Consultation Framework	DBOT	DBOE/PIU
2.	Accumulation of construction and Earth material waste and its disposal.	<ul style="list-style-type: none"> <li>Approved Waste dumping location in Bidnal &amp; FCI bhommapur</li> <li>Soil Dumping yard identified is Navbharat, Education, plantation farmers society, Shalmala nagar, kalghtagi road Dharwad &amp; unkal old WTP premises</li> </ul>	Annexure-Report 7 & 8, Soil Dumping Location.	ECOP-14.0 Soil Management	DBOT	DBOE/PIU
3.	Proper Siting and Location of construction camps	<ul style="list-style-type: none"> <li>Labor Camp/rented house/bunk beds to be planned at ELSR site premises.</li> <li>Labour Management Plan.</li> </ul>	Annexure – Picture No-8, Labour Management Implementations.  Report No-10, Labour Management Plan.	ECOP 3.0: Construction Camps Management	DBOT	DBOE/PIU

	SCHEME COMPONENT →	GLSR-RAYAPUR MBR (Pre-existing) & GLSR-RAYAPUR VILLAGE (Pre-existing) P-89 & P-90				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	<u>Rayapur MBR</u>	<ul style="list-style-type: none"> <li>Based on NDT Test, Rehabilitation Plan / Major maintenance to be</li> </ul>	N/A	ECOP 10.0 Public and	DBOT	DBOE/PIU

	Damaged slab	proposed for demolition & to be reconstructed. <ul style="list-style-type: none"> <li>Slab needs to be rectified immediately.</li> <li>Movement of workers nearby area to be avoided.</li> </ul>		Workers Health and Safety		
2.	<ul style="list-style-type: none"> <li>Chambers are not barricaded and covered by slab,</li> <li>Man, entry point is not covered properly,</li> <li>Open chambers Exposed to trespassers like children are playing and have chances to climb in staircase</li> <li>Lack of Lightings</li> <li>Increased vegetation</li> </ul>	<ul style="list-style-type: none"> <li>Replacement of Items / Major Maintenance to be considered in IIP</li> <li>Based on NDT Test, Rehabilitation Plan / Major maintenance to be considered in IIP</li> <li>Bush cutting machine to be used.</li> </ul>	N/A	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		Pipeline carrying bridge (Pre-existing) P-92				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Pipeline carrying Bridge:  No handrails in the Pipe carrying Bridge	NDT test to be carried out. Based on test report, Rehabilitation and Maintenance to be planned and implemented.	N/A	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
2.	No safe access and egress on the pipe carrying bridge	NDT test to be carried out. Based on test report, Rehabilitation and Maintenance to be planned and implemented	N/A	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

## CONSTRUCTION STAGE

### 5.2 CONSTRUCTION STAGE IMPACTS

**Table No-10,  
COMPONENT WISE CONSTRUCTION STAGE IMPACTS**

SCHEME COMPONENT →		WATER TREATMENT PLANT-AMMINBHAVI (New construction) - C-3				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex- No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increase in Dust levels due to earthwork and Vehicle movement inside the site.	<ul style="list-style-type: none"> <li>Air pollution control measures like water sprinkling are to be done.</li> <li>Vehicles' Tyres are washed regularly.</li> <li>Plants, machinery and equipment may be handled to minimize generation of dust.</li> </ul>	Annexures  Report – 29, Environmental Monitoring Plan  Report-31  Baseline Report	ECoP 9.0- Construction Plants and Equipment Management  ECoP-2 Site Preparation	DBOT	DBOE/PIU
2.	Debris, Excavated Earth Management and Topsoil Conservation. WTP all Structures Excavated Earth : 37736 CuM Backfilled/Area grading: 16847 CuM Surplus Soil : 20889 CuM.	Approved Soil Dumping Location by ULB. Murom to be used for bedding purpose at MS pipe laying activities. Surplus soil to be dumped at designated locations. <ul style="list-style-type: none"> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	Annexure- Report No 7 & 8 Soil Dumping Location	Disposal of excavated materials, Vol -2;  ECoP. 11.0 Road, Transport and Road Traffic Management.	DBOT	DBOE/PIU
3.	Increase noise levels due to Rock breaking work, movement of machinery, equipment, and vehicles	<ul style="list-style-type: none"> <li>Noise level monitoring Operators wearing Ear Plug while exposing high noise work.</li> </ul>	Annexures  Report – 29, Environmental Monitoring Plan  Report-31 Baseline Report.	ECoP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
4.	Labor Camp established in the construction site where labors exposed to Snake / Lizard /Reptiles/ Insects which affect health of workmen.	<ul style="list-style-type: none"> <li>Implementation of Labor Management Plan, Inspection of Labor Camp Inspection, Installing of snake repellent, Provision of Anti Venom from the Govt. Hospital, Regular Housekeeping</li> <li>Implementation of Emergency Response Plan.</li> </ul>	Annexure – Picture No.3  Snake Prevention Measures  Report No 5-ERP  Report No-3-MoU with Hospital	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
5.	Unauthorized Person entry	Adequate fencing/Boundary wall to be ensured.  Restricted entry is ensured by	Annexure picture No: 42	ECoP 10.0 Public and Workers	DBOT	DBOE/PIU



		security and entry register is available at entrance Gate.  CCTV facilities, Display of signage boards in vernacular language is ensured.		Health and Safety		
6.	<ul style="list-style-type: none"> <li>Rock/Boulders strata found at site, and it is to be removed using breaker fitted with excavator.</li> <li>If safety measures not followed, Operator and Equipment may get damage</li> </ul>	<ul style="list-style-type: none"> <li>Excavator with shield mesh to be engaged.</li> <li>Competent Operator to be allowed to operate equipment.</li> <li>Unauthorized person not allowed to site premises.</li> <li>Site supervision by site engineer</li> </ul>	<p>Annexure- Report No-21, SOP For WTP Civil Activities</p> <p>Picture No-16, Excavation Safety Measures</p>	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
7.	Fall of Boulders from edges around the deep excavation may cause safety hazard for workmen	<ul style="list-style-type: none"> <li>Remove the Boulders from excavation edges.</li> <li>Dump the boulders at approved dumping place.</li> <li>Provide safety Net/ Geonets arrangement to arrest free fall of Boulders around the deep excavation.</li> </ul>	<p>Annexure- Report No-21, SOP For WTP Civil Activities</p> <p>Picture No-16, Excavation Safety Measures</p> <p>Report No-7&amp;8, Soil Dumping Location</p>	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
8.	Fire and explosion during re-fueling for the Excavator or Earthmoving Equipment in the construction site.	<ul style="list-style-type: none"> <li>Refueling only to take place in well ventilated area.</li> <li>Remove all sources of ignition prior to refueling.</li> <li>Engine of the vehicles or earth moving, and other equipment shall be switched off prior to refueling.</li> <li>No smoking at any time while refueling or near fuel containers.</li> <li>Avoid spillage by using proper tools and equipment for refueling activity.</li> </ul>	Annexure- Report No-21, SOP For WTP Civil Activities	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
9.	Accident Prevention against Mechanical Material Handling	<ul style="list-style-type: none"> <li>Unloading of Rebars using spreader beam by mobile crane.</li> <li>Material Handling Permit system.</li> <li>Lifting Plan to be prepared</li> <li>Competent Riggers and Crane Operators to be deployed.</li> <li>Skill Pass and Specific Medical test for the Crane Operators and Riggers are followed.</li> <li>Safe Load Indicators and Load chart are available in crane to aware on safe load handling for operator.</li> <li>Tag lines to be used to avoid load oscillation</li> </ul>	<p>Annexure- Report No-21, SOP For WTP Civil Activities</p> <p>Picture No-15, Material Handling Safety Measures</p>	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

		<ul style="list-style-type: none"> <li>Tools and Tackles Inspection Register</li> <li>All the lifting and tackles, Lifting Equipment to be certified by the Govt. Approved Third Party/Competent Person.</li> </ul>				
10.	Accident Prevention against Electrical Hazard	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> </ul>	Annexure- Report No-21, SOP For WTP Civil Activities  Picture No -19, Electrical Safety Measure,	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
11.	Accident Prevention against Bar Bending / Bar Cutting works	<ul style="list-style-type: none"> <li>Only trained workmen shall be deployed for handling reinforcement</li> <li>Rebar bending, cutting, tying &amp; lifting works shall not be carried under the energized electric cables / lines.</li> <li>Rebar end caps or rebar strip to be provided for the elevated/protruding rebars.</li> <li>Ensure proper housekeeping at and around the Bar machines.</li> <li>Operator shall wear necessary PPE's while handling with machines</li> </ul>	Annexure- Report No-21, SOP For WTP Civil Activities	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
12.	Accident Prevention against Concreting Works	<ul style="list-style-type: none"> <li>Vehicles bringing the form work materials shall be parked at a safe distance from the excavation trench/pit.</li> <li>Pre-deployment Inspection to be carried out all machineries to use in concreting.</li> <li>All rotating part of mixer machine should be guarded.</li> <li>Authorized / trained person to operate</li> <li>While working with green concrete appropriate PPE's shall be used (Goggles, Rubber gloves and gumboot).</li> </ul>	Annexure- Report No-21, SOP For WTP Civil Activities	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
13.	Accident Prevention against Height works	<ul style="list-style-type: none"> <li>Appropriate Signage Boards</li> <li>Work Height Permits</li> <li>Work at Height Pass for workmen</li> <li>Scaffolding implementation</li> <li>Full Body Harness and Lifeline Rope.</li> <li>Mock Drill</li> </ul>	Annexure- Report No-21, 45 SOP For WTP Civil Activities	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

		<ul style="list-style-type: none"> <li>Emergency Response Management</li> <li>Safe Rescue Kit for working at height.</li> </ul>	Annexure- Picture No-20, , Height Works safety measures			
14.	Accident Prevention against Deep Excavation activity	<ul style="list-style-type: none"> <li>Hard Barricades around the Deep Excavation.</li> <li>Appropriate Signage Boards</li> <li>Safe access and egress with handrails to be provided.</li> <li>FRP Ladder to be used.</li> </ul>	Annexure- Report No-21, SOP For WTP Civil Activities  Annexure- Picture No-16, Excavation Safety Measures	ECoP 10.0 Public and Workers Health and Safety.  5.14.5 Public Safety, Vol-2, Part-3	DBOT	DBoE/PIU
15.	Accumulation of construction waste in the site causes land pollution / Soil Pollutions.	<ul style="list-style-type: none"> <li>Designated location for excess soil shifting is identified. This will avoid space constraint during construction.</li> <li>Should follow Waste Management Plan and Implementation.</li> </ul>	Annexure- Report No -02, Waste Management.	ECoP-14.0 Soil Management	DBOT	DBoE/PIU
16.	<ul style="list-style-type: none"> <li>Space Constraint for storage of Construction Materials.</li> <li>Placing the construction materials in and around the existing WTP location.</li> <li>It will disturb vehicles and labour movement, Obstructing the access of Chlorine unloading area and access of existing WTP</li> </ul>	<ul style="list-style-type: none"> <li>Arrange space for storage of Construction Materials in the way to avoid disturbance of vehicle movement.</li> <li>Access to Chlorine Tonners and GLSR to be maintained free of obstruction.</li> </ul>	Annexure Picture no -1 Site Layout	ECoP-2 Site Preparation	DBOT	DBoE/PIU
17.	<ul style="list-style-type: none"> <li>This will cause Safety issue of labours working in the site</li> <li>Accident prevention while working near by Earth moving equipment</li> </ul>	<ul style="list-style-type: none"> <li>Plan the main vehicle, plant/pedestrian access routes.</li> <li>Vehicle should be fitted with reverse horn, Mirrors in good condition. Provision of audible reversing alarms and light beacons.</li> <li>Trained banksman shall be deployed to guide the Driver/Operator while reversing.</li> <li>Signage / Caution boards to be displayed at Site.</li> <li>Vehicles not to be parked in Slope.</li> <li>Designated Vehicles Parking place to be identified.</li> <li>Using of Wheel Stoppers during Vehicle Parking.</li> </ul>	N/A	ECoP-2 Site Preparation	DBOT	DBoE/PIU
18.	<ul style="list-style-type: none"> <li>Handling of oil/diesel cause Contamination from accidental spills</li> </ul>	<ul style="list-style-type: none"> <li>Drip Tray to be provided for Spill Prevention in site.</li> </ul>	Annexure-Picture No 7 Environmental Parameter & monitoring	ECoP 12.0 Environmental Monitoring and Audit	DBOT	DBoE/PIU
19.	<ul style="list-style-type: none"> <li>Wastewater from labour camps cause unhygienic and health issues for workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Disposal of wastewater into soak pits.</li> </ul>	N/A	ECoP-6.0 Waste Management	DBOT	DBoE/PIU

SCHEME COMPONENT →		WATER TREATMENT PLANT-1, 2 & 3 Rehabilitation Works of AMMINBHAVI (Pre-existing) (C-4, C-5, C-6)				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Prevention of Fall during inspection / Sample collections across the tanks in WTP	<ul style="list-style-type: none"> <li>Handrails are to be provided as per IIP</li> <li>Periodical Inspection and Maintenance of Civil structures</li> <li>Slippery signage boards</li> <li>PPEs to be worn by all workmen in WTP</li> </ul>	Annexure Report No-22, SOP for Intake and WTP Operation & Maintenance	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
2.	Existing Chlorine storage room along with dosing area are in bad condition and without safety measures.	<ul style="list-style-type: none"> <li>New Chlorine Storage and Dosing Room to be constructed as per safety measures and in line with IIP.</li> <li>Chlorine Tonners Empty and Filled tonner to be stacked separately.</li> <li>Un authorized Person entry signage board in Chlorine tonner room.</li> </ul>	Annexure Report No-22, SOP for Intake and WTP Operation & Maintenance	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
3.	Absence of Lifting Equipment for Chlorine Tonners at storage room	<ul style="list-style-type: none"> <li>New Chlorine Storage and Dosing Room to be constructed as per safety measures and in line with IIP.</li> <li>Use Lifting Hoisting equipment for shifting of Tonners along with spreader beam/ Tools and Tackles.</li> </ul>	Annexure Report No-23, Proposed Drawing for Chlorine storage Room.	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
4.	Absence of Neutralization and Scrubber system	<ul style="list-style-type: none"> <li>Neutralization and Scrubber system to be implemented as per IIP.</li> <li>Ensure Neutralization pit filled with Caustic soda solution.</li> <li>Barricaded around the Neutralization Pit.</li> <li>Signage Board to be displayed</li> <li>Preventive maintenance of Scrubber unit.</li> </ul>	Annexure Report No-23, Proposed Drawing for Chlorine storage Room.	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
5.	Inspection and Maintenance of Electrical Equipment	<ul style="list-style-type: none"> <li>Safety Measures at all Electrical Panel Rooms to be installed as per IIP.</li> <li>Rubber Insulated Mat to be provided Infront of DB Panels.</li> <li>Preventive maintenance in Place</li> <li>Single line diagram to be displayed.</li> <li>Lock out and Tag out (LOTO) in Place</li> <li>Electrical Work Permit in Place</li> <li>Earth Discharge Rod and</li> <li>Electrical Safety Training to Team.</li> </ul>	Annexure- Report No-24, SOP for Pump Operation and Electrical works  Annexure- Pictures No-29 Electrical Safety Measures – O&M	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

6.	Inspection and Maintenance of Mechanical Equipment	<ul style="list-style-type: none"> <li>Preventive Maintenance to be planned and implemented.</li> <li>Rotating Parts are guarded.</li> </ul>	NA	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
7.	Working in Laboratory and handling of equipment	<ul style="list-style-type: none"> <li>Arrange the required Equipment at Laboratory.</li> <li>Ensure the containers are labelled in laboratory.</li> <li>Spill prevention Kit in place</li> <li>Safe Electrical Cable routing and plug points for laboratory equipment.</li> <li>Availability of MSDS for all chemicals.</li> <li>Necessary PPEs to be worn by Chemist.</li> <li>Work instructions must be readily available</li> </ul>	<p>Annexure- Report No-22, SOP for Intake and WTP Operation &amp; Maintenance</p> <p>Annexure- Pictures 30 PPE Compliances - O&amp;M</p>	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
8.	Waste handling and Disposal	<ul style="list-style-type: none"> <li>Waste Management Plan in place.</li> <li>Waste Collection Bins to be provided in Laboratory and other places in WTP.</li> <li>Segregate the wastes and dispose to authorized agency.</li> </ul>	Annexure- Report No-2, Waste Management Plan	ECoP-6.0 Waste Management	DBOT	DBOE/PIU
9.	Inspection and Maintenance of Water Reservoirs / Sumps	<ul style="list-style-type: none"> <li>Underground Sump/ GLSR are confined space,</li> <li>Confined space safety measures to be followed.</li> <li>Multi Gas Detector in place, Local Exhaust Ventilation/ Air Blower system to be arranged for ventilation during working in confined space.</li> <li>SCBA and Emergency handling Kit in place.</li> <li>Motion Scout / Motion sensor</li> <li>Confined Space Work Permit</li> <li>Confined Space SOP in place.</li> </ul>	<p>Report No-22, SOP for Intake and WTP Operation &amp; Maintenance</p> <p>Annexure – Picture No-32, Confined space Safety Measures</p>	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
10.	Building Maintenance and Working at Height works	<ul style="list-style-type: none"> <li>Working at more than 1.8 Meter consider as work at Height activity</li> <li>Height Work Permit</li> <li>Height Work SOP</li> <li>Mobile Scaffolding with Handrails / FRP Ladder in place</li> <li>Full Body Harness and Lifeline Rope in place.</li> <li>Skill Pass for workmen.</li> <li>Safety Net where required, it will be used.</li> </ul>	Annexure- Report No-22, 45 SOP for Intake and WTP Operation & Maintenance	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

11.	Increase in Dust levels due to earth work or Civil works	<ul style="list-style-type: none"> <li>Air pollution control measure like water sprinkling</li> <li>Use of barriers to reduce exposure, if required</li> <li>Plants, machinery, and equipment may be handled to minimize generation of dust</li> </ul>	Annexures Report – 29, Environmental Monitoring Report-31 Baseline Report.	ECoP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
12.	Increase noise levels due to movement of machinery, equipment and vehicles	<ul style="list-style-type: none"> <li>Increase noise levels due to movement of machinery, equipment and vehicles</li> </ul>	Report-29, Environmental Monitoring Plan.	ECoP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
13.	Temporary disruption of water supply to city	<ul style="list-style-type: none"> <li>Rehabilitation Work Plan to be implemented.</li> <li>Alternate water supply arrangement to be provided if required.</li> <li>Prior Intimation to Public through electronic and print media.</li> </ul>	Report No-28 Arrangement for Water Supply	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
14.	Accumulation of Construction waste	<ul style="list-style-type: none"> <li>Dumping the construction waste at approved location and reuse for the construction work.</li> </ul>	Annexure- Report No-7, 8 Soil Dumping Location and Map	ECoP-6.0 Waste Management; 5.13.5 Disposal of excavated materials, Vol-2;	DBOT	DBOE/PIU
15.	Working Nearby water / Tanks in WTP cause Drowning Risk	<ul style="list-style-type: none"> <li>Ensure tanks are provided with Handrails.</li> <li>Safety Personal Protective equipment</li> </ul>	Annexure- Report No-22, SOP for Intake and WTP Operation & Maintenance  Picture No-34, Drowning Hazard Safety Measures	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
SCHEME COMPONENT →		<b>CLEAR WATER PUMPHOUSE FOR DHARWAD-AMMINBHAVI (Pre-existing)</b> <b>CLEAR WATER PUMPHOUSE FOR HUBLI-AMMINBHAVI (Pre-existing)</b> <b>Raw Water Pumping Station-1 for Dharwad, SAVDATTI (Pre-existing)</b> <b>RAW WATER PUMPING STATION 2 FOR HUBLI-SAVDATTI (Pre-existing)</b> <b>Pipe carrying bridge (Pre-existing)</b> <b>(C-7, C-8, C-9, C-10, C-92)</b>				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	

					Execution	Monitoring
1.	Increase in Dust levels due to earth work or Civil works	<ul style="list-style-type: none"><li>Air pollution control measure like water sprinkling</li><li>Use of barriers to reduce exposure, if required</li><li>Plants, machinery, and equipment may be handled to minimize generation of dust</li></ul>	Annexure,  Report No 29  Environmental Monitoring	ECop 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Accumulation of Construction waste and excess earth disposal.	Dumping the construction waste at approved location and reuse for the construction work.	Annexure-  Report No-7 &8,  Soil Dumping Location	5.13.5 Disposal of excavated materials	DBOT	DBOE/PIU
3.	Working nearby water / nearby Dam/Pumphouse cause Drowning Risk	<ul style="list-style-type: none"><li>Ensure tanks are provided with Handrails.</li><li>Safety Personal Protective equipment</li></ul>	N/A	ECop 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
	SCHEME COMPONENT →	RAW WATER TRANSMISSION MAIN, SAVADATTI TO AMMINBHAVI WTP(CHAINAGE 0 TO CHAINAGE 29510) (NEW CONSTRUCTION) C-11				
No.	ESHS Issues	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
CHAINAGE 0 TO CHAINAGE 29000						
1.	Workmen working near by existing sewer line drainage work	<ul style="list-style-type: none"><li>Disinfection to be spread in the location.</li><li>PPEs 3m Type Respirator to be given.</li><li>Gas testing to be carried out before allowing nearby sewage working areas.</li></ul>	N/A	ECop 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
2.	Working in Trench cause electric risk if Underground utility presents	<ul style="list-style-type: none"><li>Before starting UG Utility will be detected by using UG detector / Trial Pit.</li><li>Shut down line if required.</li><li>Workmen using Insulated Crowbar for digging.</li></ul>	Annexure- Report -35 SOP MS Pipe Excavation and Laying  Picture No21,  MS Pipe laying Activities	ECop 10.0 Public and Workers Health and Safety  Clause 48.14.3, 10 B Particular specifications Document	DBOT	DBOE/PIU



3.	Stacked pipes in the alignment may cause Rolling of pipes due to non-providing the stoppers may cause issues to public.	<ul style="list-style-type: none"> <li>Rolling protection to be provided.</li> <li>All stacked MS pipes to be laid on daily to avoid public congestion.</li> <li>Pipes should be stacked Away from road shoulder wherever possible.</li> <li>Stick the Retroreflective sticker</li> </ul>	Annexure-Report No 38 SOP MS Pipe Transportati on Interccrating Unloading  Picture No-26,  Pipe Inter shifting Safety Measures	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
4.	Public Interference during MS Pipe unloading at roadside.	<ul style="list-style-type: none"> <li>Provide Barricades around the Trailer during unloading</li> <li>Positioning the Traffic Marshal to guide trespasser.</li> <li>Display signage Boards.</li> </ul>	Annexure-Report No 38, SOP MS Pipe Transportati on Interccrating Unloading;  Picture No-21,MS Pipe laying Activities	5.14.5 Public Safety, Vol-2, Part-3	DBOT	DBOE/PIU
5.	Improper stacking and transporting trailer loaded with MS Pipes cause workplace incident	<ul style="list-style-type: none"> <li>Trailer to be engaged at site after pre deployment inspection and verifying all legal documents</li> <li>Truck have reverse horn, sound mechanical condition</li> <li>Headboard arrangement and Side Vertical Pole arrangement to be implemented</li> <li>Ratchet Belt and MS Saddles to be implemented to avoid pipe rolling.</li> </ul>	Picture No-26,  Pipe Inter shifting Safety Measures	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
6.	Damaged slings / Defect Tools and Tackles used for pipe lifting and lowering in pipe yard cause fall of pipes and injury the workmen.	<ul style="list-style-type: none"> <li>Lifting Plan in place.</li> <li>Tools and Tackles Inspection and Colour coding.</li> <li>Competent Rigger and Crane Operator</li> <li>Using of Spreader Beam and C Clamps/ Required Lifting Hitches.</li> <li>Permit to work for Lifting and Lowering Operation.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

7.	<ul style="list-style-type: none"> <li>Health hazards from Grit blasting and polluting the environment.</li> <li>Handling of Abrasives, Inhalation of Dust</li> </ul>	<ul style="list-style-type: none"> <li>Copper slags used as Grits and grit blasting area to be identified and PCC to be provided.</li> <li>Reuse the used Grits three times and later it will be used as with murrum sand for back fill in the road</li> <li>Operator given airline breathing apparatus and PPEs to Operate.</li> </ul>	Report No 34 SOP for Grit Blasting	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
8.	Accidental fall of Blast Hose during operation and cause safety hazard to operator.	<ul style="list-style-type: none"> <li>Ensure the blast gun fitted with a 'hold-on-to-run' control / Dead Man switch control.</li> </ul>	Report No 34 SOP for Grit Blasting	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
9.	Accumulation of grits in workplace	<ul style="list-style-type: none"> <li>Abrasive blasting enclosure maintained properly</li> <li>The blasting area marked, and barriers erected to keep out personnel who are not involved in the job.</li> <li>The debris in the abrasive blasting area cleaned on daily basis/</li> <li>Surrounding is covered with Booth to avoid dust to nearby area.</li> <li>Weekly carry out the Housekeeping at workplace</li> </ul>	Report No 34 SOP for Grit Blasting	ECOP 10.0 Public and Workers Health and Safety	DBOT	Annexure SOP Grit Blasting  Picture Grit Blasting
10.	Occupational Health Hazards exposed to Concrete during ICML & Guniting	<ul style="list-style-type: none"> <li>Operators engaging in Guniting (Outer lining and Inner lining) are undergone LFT/PFT medical test.</li> <li>PPEs to be provided for concrete handling workmen.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
11.	Excavation activities without Excavation clearance permit from concerned in charge	<ul style="list-style-type: none"> <li>Excavation activity to be carried out as per Excavation safety SOP</li> <li>Excavation Permit to work</li> </ul>	Annexure-Report -35, SOP MS Pipe Excavation and Laying  Picture No21,  MS Pipe laying Activities	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
12.	Defect tools & tackles for Manual excavation & Unplanned material handling may cause issues to workers & public	<ul style="list-style-type: none"> <li>Providing insulated crow bars &amp; spades to digging workmen.</li> <li>Inspection of Tools &amp; tackles before taking into use.</li> </ul>	Picture No 21  MS Pipe laying Activities	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

13.	Using of Non-standard DG & Domestic Electrical boards	<ul style="list-style-type: none"> <li>Acoustic enclosure DG to be used</li> <li>IP-67/IP-55 Electrical distribution boards shall be used.</li> <li>All electrical joints to be provided with cable jointer/Male female IP sockets</li> </ul>	Picture No-19, Electrical Safety Measures	ECOP 9.0- Construction Plants and Equipment Management	DBOT	DBOE/PIU
14.	Damage of adjacent structures/Temporary structures near excavation lines	<ul style="list-style-type: none"> <li>Enough distance to be maintained from permanent civil structures.</li> <li>Compensation as per RFP and preparation of CAP</li> </ul>	N/A	ECOP 9.0- Construction Plants and Equipment Management	DBOT	DBOE/PIU
15.	Working during night hours in dense traffic areas.	<ul style="list-style-type: none"> <li>54 Lux illumination to be maintained.</li> <li>Night work permit to be taken before night work starts.</li> <li>Traffic Management Plan</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
16.	Hydrotesting activity in city areas for more than 2 days	<ul style="list-style-type: none"> <li>Hard barricading for excavated pit.</li> <li>Solar blinkers to alert the two wheelers &amp; four wheelers</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
17.	Not providing end plate may create Flooding during monsoon season.	<ul style="list-style-type: none"> <li>End plate shall be provided to avoid water entering inside the pipe (all type of Dia's.)</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
18.	Entanglement due to Hydrotesting machine rotating parts.	<ul style="list-style-type: none"> <li>All rotating parts of hydrotesting machine to be guarded.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
19.	Emergency communication system for Flooding due to Existing nearby MS pipe joint failures in village areas.	<ul style="list-style-type: none"> <li>Emergency response plan to be prepared for communicating with valve operators to close the valves as earliest possible</li> </ul>	Annexure-Report No-05 Emergency response Plan	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
20.	Trench settlement due to improper compaction	<ul style="list-style-type: none"> <li>Proper compaction with walk behind roller of 3T.</li> <li>Warning tapes in excavated stretch.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		CLEAR WATER TRANSMISSION MAIN, AMMINBHAVI WTP TO RAYAPUR(CHAINAGE 0 TO CHAINAGE 17712-1219mm Dia.) (864mm dia.-4749Rm)(762 mm dia.-10749Rmtr.)-(NEW CONSTRUCTION) C-12				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Workmen working near by existing sewer line drainage work	<ul style="list-style-type: none"> <li>Disinfection to be spread in the location.</li> <li>PPEs 3m Type Respirator to be given.</li> <li>Gas testing to be carried out before allowing nearby sewage working areas.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	N/A
2.	Working in Trench cause electric risk if Underground utility presents	<ul style="list-style-type: none"> <li>Before starting UG Utility will be detected by using UG detector / Trial Pit.</li> </ul>	N/A	ECOP 10.0 Public and Workers	DBOT	DBOE/PIU

		<ul style="list-style-type: none"> <li>Shut down line if required.</li> <li>Workmen using Insulated Crowbar for digging.</li> </ul>		Health and Safety  Clause 48.14.3, 10 B Particular specifications Document		
3.	Stacked pipes in the alignment may cause Rolling of pipes due to non-providing the stoppers may cause issues to public	<ul style="list-style-type: none"> <li>Rolling protection to be provided.</li> <li>All stacked MS pipes to be laid on daily to avoid public congestion.</li> <li>Pipes should be stacked Away from road shoulder wherever possible.</li> <li>Stick the Retroreflective sticker</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
4.	Public Interference during MS Pipe unloading at roadside.	<ul style="list-style-type: none"> <li>Provide Barricades around the Trailer during unloading</li> <li>Positioning the Traffic Marshal to guide trespasser.</li> <li>Display signage Boards.</li> </ul>	Report No 38 SOP MS Pipe Transportation Interacting Unloading  Picture No - 15 Material Handling Safety Measures	ECOP 10.0 Public and Workers Health and Safety;  5.14.5 Public Safety, Vol-2, Part-3	DBOT	DBOE/PIU
5.	Improper stacking and transporting trailer loaded with MS Pipes cause workplace incident	<ul style="list-style-type: none"> <li>Trailer to be engaged at site after pre deployment inspection and verifying all legal documents</li> <li>Truck have reverse horn, sound mechanical condition</li> <li>Headboard arrangement and Side Vertical Pole arrangement to be implemented</li> <li>Ratchet Belt and MS Saddles to be implemented to avoid pipe rolling.</li> </ul>	Report No 38 SOP MS Pipe Transportation Interacting Unloading  Picture No- 26,  Pipe Inter shifting Safety Measures	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
6.	Damaged slings / Defect Tools and Tackles used for pipe lifting and lowering in pipe yard cause fall of pipes and injury the workmen.	<ul style="list-style-type: none"> <li>Lifting Plan in place.</li> <li>Tools and Tackles Inspection and Colour coding.</li> <li>Competent Rigger and Crane Operator</li> <li>Using of Spreader Beam and C Clamps/ Required Lifting Hitches.</li> <li>Permit to work for Lifting and Lowering Operation.</li> </ul>	Report No 38, SOP MS Pipe Transportation Interacting Unloading	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"> <li>Health hazards from Grit blasting and polluting the environment.</li> <li>Handling of Abrasives, Inhalation of Dust</li> </ul>	<ul style="list-style-type: none"> <li>Copper slags used as Grits and grit blasting area to be identified and PCC to be provided.</li> <li>Reuse the used Grits three times and later it will be used as with murrum sand for back fill in the road</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

		<ul style="list-style-type: none"> <li>Operator given airline breathing apparatus and PPEs to Operate.</li> </ul>				
8.	Accidental fall of Blast Hose during operation and cause safety hazard to operator.	<ul style="list-style-type: none"> <li>Ensure the blast gun fitted with a 'hold-on-to-run' control / Dead Man switch control.</li> </ul>	Report No 34 SOP for Grit Blasting	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
9.	Accumulation of grits in workplace	<ul style="list-style-type: none"> <li>Abrasive blasting enclosure maintained properly</li> <li>The blasting area marked, and barriers erected to keep out personnel who are not involved in the job.</li> <li>The debris in the abrasive blasting area cleaned on daily basis/</li> <li>Surrounding is covered with Booth to avoid dust to nearby area.</li> <li>Weekly carry out the Housekeeping at workplace</li> </ul>	Report No 34 SOP for Grit Blasting	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
10.	Occupational Health Hazards exposed to Concrete during construction	<ul style="list-style-type: none"> <li>Operators engaging in Guniting (Outer lining and Inner lining) are undergone LFT/PFT medical test.</li> <li>PPEs to be provided for concrete handling workmen.</li> </ul>	Report No 34 SOP for Grit Blasting	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
11.	Excavation activities without Excavation clearance permit from concerned in charge	<ul style="list-style-type: none"> <li>Excavation activity to be carried out as per Excavation safety SOP</li> <li>Excavation Permit to work</li> </ul>	Annexure-Report -35 SOP MS Pipe Excavation and Laying	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
12.	Defect tools & tackles for Manual excavation & Unplanned material handling may cause issues to workers & public	<ul style="list-style-type: none"> <li>Providing insulated crow bars &amp; spades to digging workmen.</li> <li>Inspection of Tools &amp; tackles before taking into use.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
13.	Using of Non-standard DG & Domestic Electrical boards	<ul style="list-style-type: none"> <li>Acoustic enclosure DG to be used</li> <li>IP-67/IP-55 Electrical distribution boards shall be used.</li> <li>All electrical joints to be provided with cable jointer/Male female IP sockets</li> </ul>	Annexure report No- 66, Stack emission details	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
14.	Damage Septic tank crossing	<ul style="list-style-type: none"> <li>Safe distance to be maintained from septic tank while making holes to pass the HDPE pipes through septic tanks.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
15.	Damage of adjacent structures/Temporary structures near excavation lines	<ul style="list-style-type: none"> <li>Enough distance to be maintained from permanent civil structures.</li> <li>Compensation as per RFP and preparation of CAP</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

16.	Working during night hours in dense traffic areas.	<ul style="list-style-type: none"> <li>54 Lux illumination to be maintained.</li> <li>Night work permit to be taken before night work starts.</li> <li>Traffic Management Plan</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
17.	Delay in completion of Hydrotesting activity in city areas for more than 2 days	<ul style="list-style-type: none"> <li>Hard barricading for excavated pits is to be in place.</li> <li>Solar blinkers to alert the two wheelers &amp; four wheelers and public.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
18.	Not providing end plate may create Flooding during monsoon season.	End plate shall be provided to avoid water entering inside the pipe (all type of Dia.'s.)	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
19.	Entanglement due to Hydrotesting machine rotating parts.	All rotating parts of hydrotesting machine to be guarded.	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
20.	Emergency communication system for Flooding due to Nearby existing pipe joint failures in city areas.	Emergency response plan to be prepared for communicating with valve operators to close the valves as earliest possible	Annexure-Report No 5, Emergency Plan	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
21.	Trench settlement due to improper compaction	<ul style="list-style-type: none"> <li>Proper compaction with walk behind roller of 3T.</li> <li>Warning tapes in excavated stretch to be provided.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		DI PIPELAYING OF 102 KM at HUBLI & DHARWAD (NEW CONSTRUCTION) HDPE PIPELAYING OF 2493 KM at HUBLI & DHARWAD (NEW CONSTRUCTION) C-13 & C-14				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Workmen working near by existing sewer line drainage work	<ul style="list-style-type: none"> <li>Disinfection to be spread in the location.</li> <li>PPEs 3m Type Respirator to be given.</li> <li>Gas testing to be carried out before allowing nearby sewage working areas.</li> </ul>		ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
2.	Working in Trench causes electrical risk and hazard if underground utilities are present	<ul style="list-style-type: none"> <li>Before starting UG Utility will be detected by using UG detector / Trial Pit.</li> <li>Shut down the line if required.</li> <li>Workmen using Insulated Crow-bar for digging is to be ensured.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
3.	Stacked pipes in the alignment may cause Rolling	<ul style="list-style-type: none"> <li>Rolling protection to be provided.</li> <li>All Dumped HDPE pipes to be</li> </ul>	N/A	ECOP 10.0 Public and	DBOT	DBOE/PIU

	of pipes due to non-providing the stoppers may cause issues to public	<ul style="list-style-type: none"> <li>laid on daily to avoid public congestion.</li> <li>Pipes should be stacked Away from road shoulder wherever possible.</li> </ul>		Workers Health and Safety		
4.	Excavation activities without Excavation clearance permit from concerned in charge.	<ul style="list-style-type: none"> <li>Excavation activity to be carried out as per Excavation safety SOP</li> <li>Excavation Permit to work</li> </ul>	N/A	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
5.	Not Identifying tools & tackles for Manual excavation & Unplanned material handling may cause issues to workers & public	<ul style="list-style-type: none"> <li>Providing insulated crow bars &amp; spades to digging workmen.</li> <li>Inspection of Tools &amp; tackles before taking into use.</li> </ul>	N/A	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
6.	Using of Non-standard DG & Domestic Electrical boards	<ul style="list-style-type: none"> <li>Acoustic enclosure DG to be used</li> <li>IP-67 Electrical distribution boards shall be used.</li> <li>All electrical joints to be provided with cable jointer/Male female IP sockets</li> </ul>	N/A	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
7.	Damage Septic tank crossing	<ul style="list-style-type: none"> <li>Safe distance to be maintained from septic tank while making holes to pass the HDPE pipes through septic tanks.</li> </ul>	N/A	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
8.	Damage of adjacent structures/Temporary structures near excavation lines	<ul style="list-style-type: none"> <li>Enough distance to be maintained from permanent civil structures.</li> <li>Compensation as per RFP and preparation of CAP</li> </ul>	N/A	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
9.	Working during night hours in dense traffic areas.	<ul style="list-style-type: none"> <li>54 Lux illumination to be maintained.</li> <li>Night work permit to be taken before night work starts.</li> <li>Traffic Management Plan</li> </ul>	N/A	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
10.	Impacts while laying of Pipeline HDPE/DI/MS etc., 1. Increased dust levels & noise levels. 2. Water pollution due to leakages or damages of existing distribution lines. 3. Soil erosion and accumulation of excess earth. 4. Increase in traffic congestion on major roads. 5. Temporary loss of livelihood for occupiers of public land and ROW issues. Etc.,	<ul style="list-style-type: none"> <li>Ensure implementation of health and safety management plan.</li> <li>Cross contamination of water to be avoided by taking immediate action on leakage/damages arresting.</li> <li>Refilling and replacement of excavated earth and removal of excess earth and shifting the same to designated soil dumping yard.</li> <li>Restoration of road surface to its original condition in earliest possible time.</li> <li>Ensure proper traffic management plan.</li> <li>RP/CAP is prepared and action is to be initiated accordingly.</li> </ul>	EMP and Traffic management plan	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
11.	Hydrotesting activity in city areas for more than 2 days	<ul style="list-style-type: none"> <li>Hard barricading for excavated pit is to be provided.</li> <li>Solar blinkers to alert the two wheelers &amp; four wheelers</li> </ul>	N/A	ECoP 10.0 Public and Workers	DBOT	DBOE/PIU



				Health and Safety		
12.	Not providing end plate may create flooding during monsoon season.	•End plate shall be provided to avoid water entering inside the pipe (all type of Dia.'s.)	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
13.	Entanglement due to Hydrotesting machine rotating parts.	•All rotating parts of hydrotesting machine to be guarded.	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
14.	Emergency communication system for Flooding due to HDPE joint failures in city areas.	•Emergency response plan to be prepared for communicating with valve operators to close the valves as earliest possible	Annexure-Report No 5, Emergency Plan	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
15.	Trench settlement due to improper compaction	<ul style="list-style-type: none"> <li>• Proper compaction with walk behind roller of 3T.</li> <li>• Warning tapes in excavated stretch.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		HOUSE SERVICE CONNECTION OF 145700 nos (NEW CONSTRUCTION) C-15				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Unprotected pits	<ul style="list-style-type: none"> <li>• Proper barricading to be provided wherever pits are kept open for connecting HSCs.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
2.	Working in Trench causes electrical risk and hazard, due to underground utilities.  Improper electrical connections.	<ul style="list-style-type: none"> <li>• Before starting UG Utility will be detected by using UG detector / Trial Pit.</li> <li>• Shut down the line if required.</li> <li>• Workmen using Insulated Crow-bar for digging is to be ensured.</li> <li>• IP-67 Single phase distribution board to be used.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
3.	Delay in HSC connection leads to damages to the pipeline.	<ul style="list-style-type: none"> <li>• Timely completion of HSCs works must be ensured.</li> <li>• Commissioning the HSCs along with the pipeline.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

	SCHEME COMPONENT →	GLSR 1 (D-P1P1) DC Compound (Pre-existing) GLSR 2 DC Compound (Pre-existing) GLSR 3 (D-P1P1) DC Compound (Pre-existing) ELSR (D-P1P2) Gulganjikoppa (Pre-existing) GLSR (D-P1P2) Gulganjikoppa (Pre-existing) ELSR IIIT Dharward Ext. (Pre-existing) ELSR Kalyan Nagar (Pre-existing) ELSR (D-P1P2) KC Park (Pre-existing) ELSR (D-Demo) Maddarmaddi (Pre-existing) GLSR (D-Demo) Maddarmaddi (Pre-existing) ELSR Mrityunjaya Nagar (Pre-existing) ELSR Navalur Ext (Pre-existing) ELSR Niduvani Layout (Pre-existing) ELSR Police headquarters (Pre-existing) ELSR Rajaji Nagar Ext. (Pre-existing) GLSR Rajathgiri (Pre-existing) ELSR Sanmathinagar (Pre-existing) GLSR (D-P1P2) Saraswathpura (Pre-existing) ELSR Shambhavinagar (Pre-existing) ELSR Tadsin Koppa 1 (Pre-existing) ELSR Tadsin Koppa 2 (Pre-existing) rehabilitation works (C-16, C-17, C-18, C-20, C-21, C-22, C-23, C-24, C-25, C-26, C-27, C-28, C-29, C-30, C-38, C-39, C-40, C-43, C-44, C-45, C-46)				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Improper access – Damaged & corroded ladders, missing of hand rails may result in slip/trip even a fall of person/material hazard	<p>Ladders are to be repaired or replaced with new ladders at all locations, may subjected to changes w.r.t IIP approval.</p> <p>Steel Ladder are to be adequately tied to the staging, if vertical ladders of length more than 6m are provided safety cages shall start from 3m. (IS 11682-1985)</p> <p>Work at height pass to be issued before allowing the workmen above 1.5 mtr.</p> <p>Rectification works to be carried out as per work at height procedures.</p>	Annexure Report 45 Work at height safety measures for all type of height works	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
2.	Increase in Dust levels due to earth work or Civil works	<ul style="list-style-type: none"> <li>Air pollution control measure like water sprinkling</li> <li>Use of barriers to reduce exposure, if required</li> <li>Plants, machinery, and equipment may be handled to minimize generation of dust</li> </ul>	Annexure, Report No 29, Environmental Monitoring	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	Increased noise levels due to movement of machinery, equipment, and vehicles	Increase noise levels due to movement of machinery, equipment, and vehicles	Report No 29, Environmental Monitoring	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
4.	Temporary disruption of water supply to the city	<ul style="list-style-type: none"> <li>Rehabilitation Work Plan to be implemented.</li> <li>Alternate water supply arrangement to be provided if required.</li> <li>Prior Intimation to Public through electronic and print media.</li> </ul>	Report No-28 Arrangement for Water Supply	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

5.	Accumulation of Construction waste	Dumping the construction waste at approved location and reuse for the construction work.	Annexure- Report No-7 &8,  Soil Dumping Location	5.13.5 Disposal of excavated materials	DBOT	DBOE/PIU
6.	Unavailability of lightning arrestor, infrastructure may subject to high voltage during lightnings	<ul style="list-style-type: none"> <li>Installation of copper bonded 17X1000 mm Air termination rod with base and tapered tip with multiple points and Earth strip 25X6 -2 no's including earth pits, may subjected to changes w.r.t IIP approval.</li> </ul>	Annexure,  Picture 41 – Lighting Arrestor	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
7.	Manhole cover Missing	<ul style="list-style-type: none"> <li>CI Man hole covers of size 1.0mX1.0m with necessary reinforcement and MS frame heavy duty angle of size 50X50X6 mm thick fixed around the edges of the slab with locking arrangement.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
8.	Usage of water structures for longer periods may result in formation of slush, algae, debris, may result in deteriorating water quality.	<ul style="list-style-type: none"> <li>Cleaning of tanks including removal of slush, algae, debris, without interfere with supply schedule as per KUDIFC guidelines.</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		ELSR (D-P1P1) DC compound (New construction) C-19				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex- No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increase in dust levels due to construction activities.	<ul style="list-style-type: none"> <li>Air Monitoring</li> <li>Dust suppression.</li> </ul>	Annexure-Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increased noise levels due to movement of heavy vehicles and construction equipment	<p>Providing Operators /drivers ear mufflers and workers to control noise. Regular maintenance of vehicles</p> <p>Maintain Noise level within permissible limits..</p>	Annexure-Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management and Topsoil Conservation. ESR-0.5ML</li> <li>Excavated Earth : 376 CuM</li> <li>Backfilled: 269 CuM</li> <li>Surplus Soil : 107 CuM.</li> </ul>	<p>Designated location for excess soil shifting is identified. This will avoid space constraint during construction.</p> <p>Surplus soil will be dumped at the designated locations.</p> <ul style="list-style-type: none"> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	Annexure- Report No 7 &8, Soil Dumping Location	<p>Disposal of excavated materials, Vol -2;</p> <p>ECOP. 11.0 Road, Transport and Road Traffic Management.</p>	DBOT	DBOE/PIU

4.	<ul style="list-style-type: none"> <li>Wastewater from labour camps cause unhygienic and health issues for workmen.</li> </ul>	Disposal of wastewater into soak pits.	N/A	ECOP-6.0 Waste Management	DBOT	DBOE/PIU
5.	<ul style="list-style-type: none"> <li>Material stack at drainage side will disturb the city drainage.</li> </ul>	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> <li>Materials/Debris are not to be stacked nearby drainage location.</li> </ul>	N/A	ECOP 3.0: Construction Camp Management	DBOT	DBOE/PIU
6.	<ul style="list-style-type: none"> <li>Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> <li>Implementation of Traffic Management Plan, Vehicles Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>	Annexure –  Report No-25, SOP for ELSR.	ECOP 10.0 Public and Workers Health and Safety.	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities,</li> <li>This will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Pep talk.</li> </ul>	Annexure –  Report No-25, SOP for ELSR.	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
8.	<ul style="list-style-type: none"> <li>Accident Prevention against Electrical Hazard</li> </ul>	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> </ul>	Annexure –  Report No-25, SOP for ELSR.	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		ELSR Gulganjikoppa (New construction) C-31				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increase in dust levels due to construction activities.	<ul style="list-style-type: none"> <li>Air Monitoring</li> <li>Dust suppression.</li> </ul>	Annexure-Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increased noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear mufflers and workers to control noise. Regular maintenance of vehicles	Annexure-Report-29, Environmental Monitoring	ECOP 12.0 Environmental Monitoring and	DBOT	DBOE/PIU

		Maintain Noise level within permissible limits..	Plan.	Audit		
3.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management and Topsoil Conservation. ELSR-1.50ML</li> <li>Excavated Earth: 1331CuM</li> <li>Backfilled: 875 CuM</li> <li>Surplus Soil : 456 CuM.</li> </ul>	<p>Designated location for excess soil shifting is identified. This will avoid space constraint during construction.</p> <p>Surplus soil will be deposited at designated locations.</p> <ul style="list-style-type: none"> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	Annexure- Report No 7 &8, Soil Dumping Location	Disposal of excavated materials, Vol-2; ECoP. 11.0 Road, Transport and Road Traffic Management.	DBOT	DBOE/PIU
4.	Wastewater from labour camps cause unhygienic and health issues for workmen.	Disposal of wastewater into soak pits.	N/A	ECoP-6.0 Waste Management	DBOT	DBOE/PIU
5.	Material stack at drainage side will disturb the city drainage.	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> <li>Materials/Debris not be stacked nearby drainage location.</li> </ul>	N/A	ECoP 3.0: Construction Camp Management	DBOT	DBOE/PIU
6.	Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> <li>Implementation of Traffic Management Plan, Vehicles Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>	Annexure – Report No-25, SOP for ELSR.	ECoP 10.0 Public and Workers Health and Safety. 5.14.5 Public Safety, Vol-2, Part-3	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities,</li> <li>This will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Pep talk.</li> </ul>	Annexure – Report No-25, SOP for ELSR.	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
8.	Accident Prevention against Electrical Hazard	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> </ul>	Annexure – Report No-25, SOP for ELSR.	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

		LOTO System.				
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SCHEME COMPONENT →		GLSR Navulur (New construction) C-32				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increase in dust levels due to construction activities.	<ul style="list-style-type: none"> <li>Air Monitoring</li> <li>Dust suppression.</li> </ul>	Annexure-Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increased noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear mufflers and workers to control noise. Regular maintenance of vehicles  Maintain Noise level within permissible limits.	Annexure-Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management and Topsoil Conservation. GLSR 0.5ML</li> <li>Excavated Earth : 745CuM</li> <li>Backfilled: 249 CuM</li> <li>Surplus Soil : 496 CuM.</li> </ul>	Designated location for excess soil shifting is identified. This will avoid space constraint during construction.  Surplus soil will be deposited at designated locations. <ul style="list-style-type: none"> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	Annexure-Report No 7 &8, Soil Dumping Location	5.13.5 Disposal of excavated materials, Vol-2; ECOP. 11.0 Road, Transport and Road Traffic Management.	DBOT	DBOE/PIU
4.	Wastewater from labour camps cause unhygienic and health issues for workmen.	Disposal of wastewater into soak pits.	N/A	ECOP-6.0 Waste Management	DBOT	DBOE/PIU
5.	Material stack at drainage side will disturb the city drainage.	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> <li>Materials/Debris not be stacked nearby drainage location.</li> </ul>	N/A	ECOP 3.0: Construction Camp Management	DBOT	DBOE/PIU
6.	Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> <li>Implementation of Traffic Management Plan, Vehicles Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>	Annexure – Report No-25, SOP for ELSR.	ECOP 10.0 Public and Workers Health and Safety. 5.14.5 Public Safety, Vol-2, Part-3	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities,</li> <li>This will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Peptalk.</li> </ul>	Annexure – Report No-25, SOP for ELSR.	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

8.	<ul style="list-style-type: none"> <li>Accident Prevention against Electrical Hazard</li> </ul>	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> </ul>	Annexure –  Report No-25, SOP for ELSR.	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
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SCHEME COMPONENT →		GLSR Udaigiri (New construction) C-33				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increased dust levels due to construction activities.	<ul style="list-style-type: none"> <li>Air Monitoring</li> <li>Dust suppression.</li> </ul>	Annexure-Report-29, Environmental Monitoring Plan.	ECoP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increased noise levels due to movement of heavy vehicles and construction equipment	<p>Providing Operators /drivers ear mufflers and workers to control noise. Regular maintenance of vehicles</p> <p>Maintain Noise level within permissible limits.</p>	Annexure-Report-29, Environmental Monitoring Plan.	ECoP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management and Topsoil Conservation. GLSR-1ML</li> <li>Excavated Earth : 1441 CuM</li> <li>Backfilled: 404 CuM</li> <li>Surplus Soil : 1037CuM.</li> </ul>	<p>Designated location for excess soil shifting is identified. This will avoid space constraint during construction.</p> <p>Surplus soil will be deposited at designated locations.</p> <ul style="list-style-type: none"> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	Annexure- Report No 7 &8, Soil Dumping Location	<p>5.13.5 Disposal of excavated materials, Vol-2;</p> <p>ECoP. 11.0 Road, Transport and Road Traffic Management.</p>	DBOT	DBOE/PIU
4.	Wastewater from labour camps cause unhygienic and health issues for workmen.	Disposal of wastewater into soak pits.	N/A	ECoP-6.0 Waste Management	DBOT	DBOE/PIU
5.	Material stack at drainage side will disturb the city drainage.	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises. Materials/Debris not be stacked nearby drainage location.</li> </ul>	N/A	ECoP 3.0: Construction Camp Management	DBOT	DBOE/PIU



6.	<ul style="list-style-type: none"> <li>Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> <li>Implementation of Traffic Management Plan, Vehicles Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>	Annexure –  Report No-25, SOP for ELSR.	ECOP 10.0 Public and Workers Health and Safety.  5.14.5 Public Safety, Vol-2, Part-3	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities,</li> <li>This will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Pep talk.</li> </ul>	Annexure –  Report No-25, SOP for ELSR.	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
8.	<ul style="list-style-type: none"> <li>Accident Prevention against Electrical Hazard</li> </ul>	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> </ul>	Annexure –  Report No-25, SOP for ELSR.	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		GLSR Yettingudda (New construction) C-34				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increase dust levels due to construction activities.	<ul style="list-style-type: none"> <li>Air Monitoring</li> <li>Dust suppression.</li> </ul>	Annexure-Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increase noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear muffers and workers to control noise. Regular maintenance of vehicles  Maintain Noise level within permissible limits.	Annexure-Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU

3.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management and Topsoil Conservation. GLSR-1ML</li> <li>Excavated Earth : 1441CuM</li> <li>Backfilled: 404CuM</li> <li>Surplus Soil : 1037 CuM.</li> </ul>	<p>Designated location for excess soil shifting is identified. This will avoid space constraint during construction.</p> <p>Surplus soil will be deposited at designated locations.</p> <ul style="list-style-type: none"> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	Annexure- Report No 7 &8, Soil Dumping Location	5.13.5 Disposal of excavated materials, Vol-2; ECoP. 11.0 Road, Transport and Road Traffic Management.	DBOT	DBOE/PIU
4.	<ul style="list-style-type: none"> <li>Wastewater from labour camps cause unhygienic and health issues for workmen.</li> </ul>	Disposal of wastewater into soak pits.	N/A	ECoP-6.0 Waste Management	DBOT	DBOE/PIU
5.	<ul style="list-style-type: none"> <li>Material stack at drainage side will disturb the city drainage.</li> </ul>	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> </ul> <p>Materials/Debris not be stacked nearby drainage location.</p>	N/A	ECoP 3.0: Construction Camp Management	DBOT	DBOE/PIU
6.	<ul style="list-style-type: none"> <li>Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> <li>Implementation of Traffic Management Plan, Vehicles Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>	Annexure – Report No-25, SOP for ELSR.	ECoP 10.0 Public and Workers Health and Safety. 5.14.5 Public Safety, Vol-2, Part-3	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities,</li> <li>This will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Peptalk.</li> </ul>	Annexure – Report No-25, SOP for ELSR.	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
8.	<ul style="list-style-type: none"> <li>Accident Prevention against Electrical Hazard</li> </ul>	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> </ul>	Annexure – Report No-25, SOP for ELSR.	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		ELSR Kelgiri Tapovan ( New construction)- C-35			
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex- No.	Contract clause ref	Responsibility

					Execution	Monitoring
1.	Increased dust levels due to construction activities.	Air Monitoring Dust suppression.	Annexure- Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increased noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear muffers and workers to control noise. Regular maintenance of vehicles  Maintain Noise level within permissible limits.	Annexure- Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management and Topsoil Conservation. ELSR-1.5ML</li> <li>Excavated Earth : 965 CuM</li> <li>Backfilled: 547 CuM</li> <li>Surplus Soil : 418 CuM.</li> </ul>	<p>Designated location for excess soil shifting is identified. This will avoid space constraint during construction.</p> <p>Surplus</p> <p>Surplus soil will be deposited at designated locations.</p> <ul style="list-style-type: none"> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	Annexure- Report No 7 &8, Soil Dumping Location	<p>5.13.5 Disposal of excavated materials, Vol-2;</p> <p>ECOP. 11.0 Road, Transport and Road Traffic Management.</p>	DBOT	DBOE/PIU
4.	<ul style="list-style-type: none"> <li>Wastewater from labour camps cause unhygienic and health issues for workmen.</li> </ul>	Disposal of wastewater into soak pits.	N/A	ECOP-6.0 Waste Management	DBOT	DBOE/PIU
5.	<ul style="list-style-type: none"> <li>Material stack at drainage side will disturb the city drainage.</li> </ul>	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises. Materials/Debris not be stacked nearby drainage location.</li> </ul>	N/A	ECOP 3.0: Construction Camp Management	DBOT	DBOE/PIU
6.	<ul style="list-style-type: none"> <li>Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> <li>Implementation of Traffic Management Plan, Vehicles Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>	Annexure –  Report No-25, SOP for ELSR.	<p>ECOP 10.0 Public and Workers Health and Safety.</p> <p>5.14.5 Public Safety, Vol-2, Part-3</p>	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities, this will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Peptalk.</li> </ul>	Annexure –  Report No-25, SOP for ELSR.	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
8.	<ul style="list-style-type: none"> <li>Accident Prevention against Electrical Hazard</li> </ul>	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> </ul>	Annexure –  Report No-25,	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

		<ul style="list-style-type: none"> <li>• Work to Permit for Electrical Works.</li> <li>• Insulation mats shall be placed in front of Electrical Panels</li> <li>• Industrial type sockets and plug top.</li> <li>• Electrical safety Inspection Report</li> <li>• FRP type Ladder only to be used.</li> <li>• Competent Electrician.</li> <li>• Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>• LOTO System.</li> </ul>	SOP for ELSR.			
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SCHEME COMPONENT →		ELSR Karnataka University(New construction) -C-36				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex- No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increased dust levels due to construction activities.	<ul style="list-style-type: none"> <li>• Air Monitoring Dust suppression.</li> </ul>	Annexure- Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increased noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear mufflers and workers to control noise. Regular maintenance of vehicles  Maintain Noise level within permissible limits.	Annexure- Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	<ul style="list-style-type: none"> <li>• Debris , Excavated Earth Management and Topsoil Conservation. ELSR-1ML</li> <li>• Excavated Earth : 867 CuM</li> <li>• Backfilled: 659 CuM</li> <li>• Surplus Soil : 208 CuM.</li> </ul>	Designated location for excess soil shifting is identified. This will avoid space constraint during construction.  Surplus soil will be deposited at designated locations.  <ul style="list-style-type: none"> <li>• Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	Annexure- Report No 7 &8, Soil Dumping Location	5.13.5 Disposal of excavated materials, Vol-2;  ECOP. 11.0 Road, Transport and Road Traffic Management.	DBOT	DBOE/PIU
4.	<ul style="list-style-type: none"> <li>• Wastewater from labour camps cause unhygienic and health issues for workmen.</li> </ul>	Disposal of wastewater into soak pits.	N/A	ECOP-6.0 Waste Management	DBOT	DBOE/PIU
5.	<ul style="list-style-type: none"> <li>• Material stack at drainage side will disturb the city drainage.</li> </ul>	<ul style="list-style-type: none"> <li>• Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> <li>• Materials/Debris not be stacked nearby drainage location.</li> </ul>	N/A	ECOP 3.0: Construction Camp Management	DBOT	DBOE/PIU
6.	<ul style="list-style-type: none"> <li>• Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.</li> </ul>	<ul style="list-style-type: none"> <li>• Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>• Provide Hard Barricades, Safety Signage Boards.</li> <li>• Implementation of Traffic</li> </ul>	Annexure – Report No-25, SOP	ECOP 10.0 Public and Workers Health and	DBOT	DBOE/PIU

		Management Plan, Vehicles Parking • Visitor Induction and Site Logistic Layout Plan.	for ELSR.	Safety.  5.14.5 Public Safety, Vol-2, Part-3		
7.	• Failure to follow safety measures while working at Height activities, • This will cause workplace incident and injury to workmen.	• Scaffolding to use for work at Height activity. • Height Work Permit system, • Handrails in platform, • Full Body Safety Harness, • Safety Net arrangement, • Working at Height Pass, • Basic PPEs, Training, Peptalk.	Annexure –  Report No-25, SOP for ELSR.	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
8.	• Accident Prevention against Electrical Hazard	• Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity. • Work to Permit for Electrical Works. • Insulation mats shall be placed in front of Electrical Panels • Industrial type sockets and plug top. • Electrical safety Inspection Report • FRP type Ladder only to be used. • Competent Electrician. • Monthly Joint Electrical Inspection by P&M Engineer with EHS. • LOTO System.	Annexure –  Report No-25, SOP for ELSR.	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		ELSR Lakhmanahalli (New construction)- C-37				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increased dust levels due to construction activities.	• Air Monitoring Dust suppression.	Annexure- Report-29, Environmental Monitoring Plan.	ECoP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increased noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear mufflers and workers to control noise. Regular maintenance of vehicles  Maintain Noise level within permissible limits.	Annexure- Report-29, Environmental Monitoring Plan.	ECoP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU

3.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management and Topsoil Conservation. ELSR-0.5ML</li> <li>Excavated Earth : 376CuM</li> <li>Backfilled: 269 CuM</li> <li>Surplus Soil : 107 CuM.</li> </ul>	<p>Designated location for excess soil shifting is identified. This will avoid space constraint during construction.</p> <p>Surplus soil will be deposited at designated locations.</p> <ul style="list-style-type: none"> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	Annexure- Report No 7 &8, Soil Dumping Location	5.13.5 Disposal of excavated materials, Vol-2;  ECOP. 11.0 Road, Transport and Road Traffic Management	DBOT	DBOE/PIU
4.	<ul style="list-style-type: none"> <li>Wastewater from labour camps cause unhygienic and health issues for workmen.</li> </ul>	Disposal of wastewater into soak pits.	N/A	ECOP-6.0 Waste Management	DBOT	DBOE/PIU
5.	<ul style="list-style-type: none"> <li>Material stack at drainage side will disturb the city drainage.</li> </ul>	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> <li>Materials/Debris not be stacked nearby drainage location.</li> </ul>	N/A	ECOP 3.0: Construction Camp Management	DBOT	DBOE/PIU
6.	<ul style="list-style-type: none"> <li>Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> <li>Implementation of Traffic Management Plan, Vehicles Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>	Annexure – Report No-25, SOP for ELSR.	ECOP 10.0 Public and Workers Health and Safety.  5.14.5 Public Safety, Vol-2, Part-3	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities,</li> <li>This will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Peptalk.</li> </ul>	Annexure – Report No-25, SOP for ELSR.	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
8.	<ul style="list-style-type: none"> <li>Accident Prevention against Electrical Hazard</li> </ul>	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> </ul>	Annexure – Report No-25, SOP for ELSR.	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT → ELSR (D-P1P2) Saraswathpura (New construction) ELSR (D-P1P2) Saraswathpura-Demolition (Pre-existing- to be de-commissioned) C-41 & C-42						
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increased noise levels due to demolition and movement of vehicles and construction equipment	Providing Operators /drivers ear mufflers and workers to control noise. Regular maintenance of vehicles  Maintain Noise level within permissible limits.	Report-29 Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increased in Dust Level due to demolition and earth works.	<ul style="list-style-type: none"> <li>Air Monitoring and Conformance to standards and norms.</li> <li>Water the material stockpiles, access roads and bare soils on an as required basis to minimize dust</li> </ul>	Report-29 Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	Possibility of poisonous snakes	<ul style="list-style-type: none"> <li>Emergency Response Plan.</li> <li>Snake Repellent / Vibrator to be installed as precaution Measures.</li> <li>Adequate Lighting arrangement in the Site.</li> <li>Weekly Housekeeping Campaign to be conducted.</li> <li>Snake Catcher Person with necessary Tools to be engaged</li> </ul>	Annexure – 3 Picture No.3  Snake Prevention Measures  Report No 5, ERP  Report No-3, MoU with Hospital	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
4.	Accumulation of C&D Waste of ELSR-0.1ML. <ul style="list-style-type: none"> <li>Quantity: 100 CUM ELSR 0.5 ML</li> <li>Excavated Soil-376 CUM</li> <li>Backfilled: 269 Cum</li> <li>Surplus Soil: 107 Cum</li> </ul>	<ul style="list-style-type: none"> <li>Excavated earth material should be reused for backfilling between foundations.</li> <li>Surplus soil will be dumped at designated locations.</li> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	Annexure Report No – 7 & 8 Approved Soil Dumping Location	5.13.5 Disposal of excavated materials  ECOP. 11.0 Road, Transport and Road Traffic Management.	DBOT	DBOE/PIU
5.	<ul style="list-style-type: none"> <li>Accumulation of construction waste in the site cause land pollution / Soil Pollutions.</li> </ul>	<ul style="list-style-type: none"> <li>Waste Management Plan and Implementation.</li> </ul>	Annexure- Report No-2, Waste Management Plan	ECOP 3.0: Construction Camp Management	DBOT	DBOE/PIU
6.	<ul style="list-style-type: none"> <li>Unprotected Deep Excavation during constructing of structure. This will cause Fall of labours, Visitors, Vehicles, Equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> <li>Implementation of Traffic Management Plan, Vehicles Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>	Annexure  Report No-25, SOP ELSR construction  Annexure- Picture No-16,  Excavation Safety Measures	ECOP-6.0 Waste Management.  5.14.5 Public Safety, Vol-2, Part-3	DBOT	DBOE/PIU



7.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities, this will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system, Handrails in platform, Full Body Safety Harness, Safety Net arrangement, Working at Height Pass, Basic PPEs, Training, Pep talk.</li> </ul>	<p>Annexure</p> <p>Report No-25, SOP ELSR construction</p> <p>Report No-11, Work at Height Pass, Skill Pass</p> <p>Picture No-20, Work at Height Measures</p>	ECoP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU
8.	<ul style="list-style-type: none"> <li>Wastewater from labour camps cause unhygienic and health issues for workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Disposal of wastewater into soak pits.</li> </ul>	N/A	ECoP 3.0: Construction Camp Management	DBOT	DBOE/PIU
9.	<ul style="list-style-type: none"> <li>Material stack at drainage side will disturb the city drainage.</li> </ul>	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> <li>Materials/Debris not be stacked nearby drainage location.</li> </ul>	N/A	ECoP 3.0: Construction Camp Management	DBOT	DBOE/PIU

SCHEME COMPONENT →		GLSR Tarihal (New construction)- C-47				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increased dust levels due to construction activities.	<ul style="list-style-type: none"> <li>Air Monitoring</li> <li>Dust suppression.</li> <li>EMP needs to be followed.</li> </ul>	Annexure- Report-29, Environmental Monitoring Plan.	ECoP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increased noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear muffers and workers to control noise. Regular maintenance of vehicles.	Annexure- Report-29, Environmental Monitoring Plan.	ECoP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management and Topsoil Conservation. ELSR-1ML</li> <li>Excavated Earth : 1441 CuM</li> <li>Backfilled: 404 CuM</li> <li>Surplus Soil : 1037 CuM.</li> </ul>	<p>Designated location for excess soil shifting is identified. This will avoid space constraint during construction.</p> <p>Surplus soil will be deposited at designated locations.</p> <ul style="list-style-type: none"> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	Annexure- Report No 7 & 8, Soil Dumping Location	<p>5.13.5 Disposal of excavated materials, Vol-2;</p> <p>ECoP. 11.0 Road, Transport and Road Traffic Management.</p>	DBOT	DBOE/PIU
4.	<ul style="list-style-type: none"> <li>Wastewater from labour camps cause unhygienic and health issues for workmen.</li> </ul>	<p>Disposal of wastewater into soak pits.</p> <p>Also to follow Waste management</p>	N/A	ECoP-6.0 Waste Management	DBOT	DBOE/PIU

		plan.				
5.	<ul style="list-style-type: none"> <li>Material stack at drainage side will disturb the city drainage.</li> </ul>	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> <li>Materials/Debris not to be stacked nearby drainage location.</li> </ul>	N/A	ECOP 3.0: Construction Camp Management	DBOT	DBOE/PIU
6.	<ul style="list-style-type: none"> <li>Unprotected Deep Excavation during construction of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> <li>Implementation of Traffic Management Plan, Vehicles Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>	Annexure –  Report No-25, SOP for ELSR.	ECOP 10.0 Public and Workers Health and Safety.  5.14.5 Public Safety, Vol-2, Part-3	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities,</li> <li>This will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Peptalk.</li> </ul>	Annexure –  Report No-25, SOP for ELSR.	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
8.	<ul style="list-style-type: none"> <li>Accident Prevention against Electrical Hazard</li> </ul>	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> </ul>	Annexure –  Report No-25, SOP for ELSR.	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

	SCHEME COMPONENT →	GLSR Tejasvi Nagar (Pre-existing) ELSR Vanashree Nagar 1(HDUDA) (Pre-existing) ELSR Vanashree Nagar 2(Temple Premises) (Pre-existing) ELSR Vanashree Nagar 3(Mother Teresa School) (Pre-existing) GLSR Yettingudda (AU) Ext. (Pre-existing) GLSR Ayodhya Nagar Ext. (Pre-existing) ELSR (H-P1P1) Balaji Nagar (Pre-existing) GLSR Keshwapur Ext. (Pre-existing) ELSR Soniagandhi Ext. (Pre-existing) ELSR (H-P1P2) Gabbur (Pre-existing) ELSR 1 HDMC (Pre-existing) ELSR 2 HDMC (Pre-existing) GLSR (H-P1P1) HDMC (Pre-existing) GLSR Karwar Road Ext (Pre-existing) ELSR Karwar Road Ext (Pre-existing) ELSR (H-P1P2) Keshwapur Ext. (Pre-existing) (C-48 To C-54, C-57, C-58, C-61, C-65, C-66, C-67, C-68, C-69, C-71)			
No.	Environmental / Social	Suggested Mitigation Measure(s)	Details in Annex-	Contract	Responsibility

	Issue		No.	clause ref	Execution	Monitoring
1.	Rehabilitation works.	Implementation as per agreed IIP after approval.	N/A	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
2.	Increased Dust levels due to earth work or Civil works	<ul style="list-style-type: none"> <li>Air pollution control measure like water sprinkling</li> <li>Use of barriers to reduce exposure, if required</li> <li>Plants, machinery, and equipment may be handled to minimize generation of dust</li> </ul>	Annexure,  Report No 29,  Environmental Monitoring	ECoP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	Increased noise levels due to movement of machinery, equipment, and vehicles	<p>Providing Operators /drivers ear mufflers and workers to control noise.</p> <p>Regular maintenance of vehicles.</p>	Report No 29,  Environmental Monitoring	ECoP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
4.	Temporary disruption of water supply to city	<ul style="list-style-type: none"> <li>Rehabilitation Work Plan to be implemented.</li> <li>Alternate water supply arrangement to be provided if required.</li> <li>Prior Intimation to Public through electronic and print media.</li> </ul>	Report No-28  Arrangement for Water Supply	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
5.	Accumulation of Construction waste	<ul style="list-style-type: none"> <li>Dumping the construction waste at approved location and reuse for the construction work.</li> </ul>	Annexure-  Report No-7 &8,  Soil Dumping Location	5.13.5 Disposal of excavated materials	DBOT	DBOE/PIU
6.	Unavailability of lightning arrestor, infrastructure may subject to high voltage during lightnings	<ul style="list-style-type: none"> <li>Installation of copper bonded 17X1000 mm Air termination rod with base and tapered tip with multiple points and Earth strip 25X6 -2 no's including earth pits, may subjected to changes w.r.t IIP approval.</li> </ul>	Annexure,  Picture 41 – Lighting Arrestor	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
7.	Manhole cover Missing	<ul style="list-style-type: none"> <li>CI Man hole covers of size 1.0mX1.0m with necessary reinforcement and MS frame heavy duty angle of size 50X50X6 mm thick fixed around the edges of the slab with locking arrangement.</li> </ul>	N/A	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
8.	Usage of water structures for longer periods may result in formation of slush, algae, debris, may result in deteriorating water quality.	<ul style="list-style-type: none"> <li>Cleaning of tanks including removal of slush, algae, debris, without interfere with supply schedule as per KUDIFC guidelines.</li> </ul>	N/A	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
9.	Improper access – Damaged & corroded ladders, missing of hand rails may result in slip/trip even a fall of person/material hazard.	<p>Ladders are to be repaired or replaced with new ladders at all locations, may subjected to changes w.r.t IIP approval.</p> <p>Steel Ladder are to be adequately tied to the staging, if vertical</p>	Annexure Report 45 Work at height safety measures for all type of height works	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

		ladders of length more than 6m are provided safety cages shall start from 3m. (IS 11682-1985)				
		Work at height pass to be issued before allowing the workmen above 1.5 mtr. <ul style="list-style-type: none"> <li>Rectification works to be carried out as per work at height procedures.</li> </ul>				

SCHEME COMPONENT →		ELSR (H-PIP1) Balaji Nagar additional (New construction)- C-55				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increased dust levels due to construction activities.	<ul style="list-style-type: none"> <li>Air Monitoring</li> <li>Dust suppression.</li> </ul>	Annexure-Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increased noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear mufflers and workers to control noise. Regular maintenance of vehicles  Maintain Noise level within permissible limits.	Annexure-Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management and Topsoil Conservation. ELSR-1.5ML</li> <li>Excavated Earth : 965 CuM</li> <li>Backfilled:547CuM</li> <li>Surplus Soil : 418 CuM.</li> </ul>	Designated location for excess soil shifting is identified. This will avoid space constraint during construction.  Surplus soil will be deposited at designated locations.  <ul style="list-style-type: none"> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	Annexure-Report No 7 &8, Soil Dumping Location	5.13.5 Disposal of excavated materials, Vol-2;  ECoP. 11.0 Road, Transport and Road Traffic Management.	DBOT	DBOE/PIU
4.	Wastewater from labour camps cause unhygienic and health issues for workmen.	Disposal of wastewater into soak pits.	N/A	ECoP-6.0 Waste Management	DBOT	DBOE/PIU
5.	Material stack at drainage side will disturb the city drainage.	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> <li>Materials/Debris not be stacked nearby drainage location.</li> </ul>	N/A	ECoP 3.0: Construction Camp Management	DBOT	DBOE/PIU
6.	Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> <li>Implementation of Traffic Management Plan, Vehicles</li> </ul>	Annexure – Report No-25, SOP for ELSR.	ECoP 10.0 Public and Workers Health and Safety.	DBOT	DBOE/PIU

		Parking <ul style="list-style-type: none"> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>		5.14.5 Public Safety, Vol-2, Part-3		
7.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities,</li> <li>This will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Peptalk.</li> </ul>	Annexure –  Report No-25, SOP for ELSR.	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
8.	<ul style="list-style-type: none"> <li>Accident Prevention against Electrical Hazard</li> </ul>	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> </ul>	Annexure –  Report No-25, SOP for ELSR.	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		ELSR Buddha Vihar (New construction)- C-56				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management ELSR-2.5ML</li> <li>Excavated Earth : 1957 CuM</li> <li>Backfilled: 113 CuM</li> <li>Surplus Soil : 1844 CuM.</li> </ul>	Approved Soil Dumping Location proposed by ULB.  Surplus soil will be deposited at designated locations. <ul style="list-style-type: none"> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	Annexure-Report No 7 & 8, Soil Dumping Location	5.13.5 Disposal of excavated materials, Vol-2;  ECOP. 11.0 Road, Transport and Road Traffic Management.	DBOT	DBOE/PIU
2.	Labour Management: 15 Number of Labours planned to deployment.	<ul style="list-style-type: none"> <li>Labour Camp/Rented house to be established at ESR site premises.</li> <li>Implementation of Labour Management Plan.</li> </ul>	Annexure Report No 10, Labour Management Plan	ECOP 9.0- Construction Plants and Equipment Management	DBOT	DBOE/PIU
3.	Accumulation of construction and Earth material waste.	Implementation of Excavated Earthwork Soil Storage and	Annexure – Report No 7&8, Soil	5.13.5 Disposal of excavated materials, Vol-	DBOT	DBOE/PIU

		Disposal Management Plan  Designated location for excess soil shifting is identified. This will avoid space constraint during construction.	Dumping Location  7A Approved soil dumping locations by KUDIFC	2;		
4.	Disturbing the site environment and surroundings due to construction works.	<ul style="list-style-type: none"> <li>Air Quality Monitoring</li> <li>Noise Monitoring</li> <li>Mobilization of Plant and Machineries with Pollution Under Control Certificate.</li> <li>Genset Emissions and Noise Monitoring</li> </ul>	Annexure  Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
5.	Material stack at drainage side will disturb the city drainage.	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> <li>Materials/Debris not be stacked nearby drainage location.</li> </ul>	N/A	ECOP 3.0: Construction Camp Management	DBOT	DBOE/PIU
6.	Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> <li>Implementation of Traffic Management Plan, Vehicles Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>	Annexure Report No-25, SOP for ELSR	ECOP 10.0 Public and Workers Health and Safety.  5.14.5 Public Safety, Vol-2, Part-3	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities,</li> <li>This will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Peptalk.</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
8.	Accident Prevention against Electrical Hazard	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →	ELSR Bidnal (New construction)- C-59
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No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increased noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear mufflers and workers to control noise. Regular maintenance of vehicles  Maintain Noise level within permissible limits.	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increase in Dust levels due to earth work	<ul style="list-style-type: none"> <li>Air Monitoring and Conformance to standards and norms.</li> <li>Water the material stockpiles, access roads and bare soils on an as required basis to minimize dust</li> </ul>	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	Accumulation of construction waste in the site cause land pollution / Soil Pollutions.	<ul style="list-style-type: none"> <li>Waste Management Plan and Implementation.</li> <li>Designated location for excess soil shifting is identified. This will avoid space constraint during construction.</li> </ul>	Annexure – Report No 7&8, Soil Dumping Location  7A Approved soil dumping locations by KUDIFC	ECOP-6.0 Waste Management	DBOT	DBOE/PIU
4.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management ELSR-0.5ML</li> <li>Excavated Earth : 376 CuM</li> <li>Backfilled: 269 CuM</li> <li>Surplus Soil :107 CuM.</li> </ul>	<p>Designated location for excess soil shifting is identified. This will avoid space constraint during construction.</p> <p>Implementation of Excavated Earthwork Soil Storage and Disposal Management Plan</p> <p>Surplus soil will be deposited at designated locations.</p> <ul style="list-style-type: none"> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	Annexure- Report No 7 &8, Soil Dumping Location	5.13.5 Disposal of excavated materials, Vol-2;  ECOP. 11.0 Road, Transport and Road Traffic Management.	DBOT	DBOE/PIU
5.	<ul style="list-style-type: none"> <li>Labour Mobilization for construction works.</li> <li>Labour Strength : 20 to 15 Nos</li> </ul>	<ul style="list-style-type: none"> <li>At site, 1 bathroom and 1 toilets to be arranged.</li> <li>Labours from nearby Workmen camp to be transported by passenger vehicles to site.</li> </ul>	Annexure – Report No-10, Labour Management Procedures	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
6.	Material stack at drainage side will disturb the city drainage.	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> <li>Materials/Debris not be stacked nearby drainage location.</li> </ul>	N/A	ECOP 3.0: Construction Camp Management	DBOT	DBOE/PIU
7.	Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles,	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health &	DBOT	DBOE/PIU



	Equipment.	<ul style="list-style-type: none"> <li>Implementation of Traffic Management Plan, Vehicles Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>		Safety.  5.14.5 Public Safety, Vol-2, Part-3		
8.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities,</li> <li>This will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Peptalk.</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU
9.	Accident Prevention against Electrical Hazard	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		ELSR FCI Bhommapur (New construction)- C-60				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increased noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear mufflers and workers to control noise. Regular maintenance of vehicles  Maintain Noise level within permissible limits.	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increase in Dust levels due to earth work	<ul style="list-style-type: none"> <li>Air Monitoring and Conformance to standards and norms.</li> <li>Water the material stockpiles, access roads and bare soils on an as required basis to minimize dust</li> </ul>	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	Accumulation of construction waste in the site cause land pollution / Soil Pollutions.	Waste Management Plan and Implementation.	Annexure – Report No 7&8, Soil Dumping Location  7A Approved soil dumping locations by KUDIFC	ECOP-6.0 Waste Management	DBOT	DBOE/PIU
4.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management</li> </ul>	<ul style="list-style-type: none"> <li>Designated location for excess soil shifting is identified. This will</li> </ul>	Annexure- Report No 7	5.13.5 Disposal of	DBOT	DBOE/PIU

	<p>ELSR-2ML</p> <ul style="list-style-type: none"> <li>Excavated Earth : 1608 CuM</li> <li>Backfilled: 1028 CuM</li> <li>Surplus Soil : 580 CuM.</li> </ul>	<p>avoid space constraint during construction.</p> <ul style="list-style-type: none"> <li>Implementation of Excavated Earthwork Soil Storage and Disposal Management Plan.</li> <li>Surplus soil will be deposited at designated locations.</li> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	&8, Soil Dumping Location	excavated materials, Vol-2;  ECoP. 11.0 Road, Transport and Road Traffic Management.		
5.	<ul style="list-style-type: none"> <li>Labour Mobilization for construction works.</li> <li>Labour Strength : 20 to 15 Nos</li> </ul>	<ul style="list-style-type: none"> <li>At site, 1 bathroom and 1 toilets to be arranged.</li> <li>Labours from nearby Workmen camp to be transported by passenger vehicles to site.</li> </ul>	Annexure – Report No-10, Labour Management	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
6.	<ul style="list-style-type: none"> <li>Material stack at drainage side will disturb the city drainage.</li> </ul>	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> <li>Materials/Debris not be stacked nearby drainage location.</li> </ul>	N/A	ECoP 3.0: Construction Camp Management	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"> <li>Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> <li>Implementation of Traffic Management Plan, Vehicles Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>	Report No-25, SOP for ELSR	ECoP 10.0: Public and Worker's Health & Safety.  5.14.5 Public Safety, Vol-2, Part-3	DBOT	DBOE/PIU
8.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities,</li> <li>This will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Peptalk.</li> </ul>	Report No-25, SOP for ELSR	ECoP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU
9.	<ul style="list-style-type: none"> <li>Accident Prevention against Electrical Hazard</li> </ul>	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> </ul>	Report No-25, SOP for ELSR	ECoP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		ELSR Gokul Village (New construction) - C-62				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring

1.	Increased noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear mufflers and workers to control noise. Regular maintenance of vehicles  Maintain Noise level within permissible limits.	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increase in Dust levels due to earth work	<ul style="list-style-type: none"> <li>Air Monitoring and Conformance to standards and norms.</li> <li>Water the material stockpiles, access roads and bare soils on an as required basis to minimize dust</li> </ul>	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	Accumulation of construction waste in the site cause land pollution / Soil Pollutions.	Waste Management Plan and Implementation.	Annexure – Report No 7&8, Soil Dumping Location  7A Approved soil dumping locations by KUDIFC	ECOP-6.0 Waste Management	DBOT	DBOE/PIU
4.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management ELSR-1ML</li> <li>Excavated Earth : 867 CuM</li> <li>Backfilled: 659 CuM</li> <li>Surplus Soil : 208 CuM.</li> </ul>	<p>Designated location for excess soil shifting is identified. This will avoid space constraint during construction.</p> <p>Implementation of Excavated Earthwork Soil Storage and Disposal Management Plan</p> <p>Surplus soil will be deposited at designated locations.</p> <ul style="list-style-type: none"> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	Annexure- Report No 7 &8, Soil Dumping Location	<p>5.13.5 Disposal of excavated materials, Vol-2;</p> <p>ECOP. 11.0 Road, Transport and Road Traffic Management.</p>	DBOT	DBOE/PIU
5.	<ul style="list-style-type: none"> <li>Labour Mobilization for construction works.</li> <li>Labour Strength : 20 to 15 Nos</li> </ul>	<ul style="list-style-type: none"> <li>At site, 1 bathroom and 1 toilets to be arranged.</li> <li>Labours from nearby Workmen camp to be transported by passenger vehicles to site.</li> </ul>	Annexure – Report No-10, Labour Management and Labour Transportation	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
6.	<ul style="list-style-type: none"> <li>Material stack at drainage side will disturb the city drainage.</li> </ul>	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> <li>Materials/Debris not be stacked nearby drainage location.</li> </ul>	N/A	ECOP 3.0: Construction Camp Management	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"> <li>Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> <li>Implementation of Traffic Management Plan, Vehicles Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>	Report No-25, SOP for ELSR	<p>ECOP 10.0: Public and Worker's Health &amp; Safety.</p> <p>5.14.5 Public Safety, Vol-</p>	DBOT	DBOE/PIU

				2,Part-3		
8.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities,</li> <li>This will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Peptalk.</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU
9.	<ul style="list-style-type: none"> <li>Accident Prevention against Electrical Hazard</li> </ul>	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		GLSR Gowrishankar (New construction) - C-63				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex- No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increased noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear mufflers and workers to control noise. Regular maintenance of vehicles  Maintain Noise level within permissible limits.	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increase in Dust levels due to earth work	<ul style="list-style-type: none"> <li>Air Monitoring and Conformance to standards and norms.</li> <li>Water the material stockpiles, access roads and bare soils on an as required basis to minimize dust</li> </ul>	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	Accumulation of construction waste in the site cause land pollution / Soil Pollutions.	Designated location for excess soil shifting is identified. This will avoid space constraint during construction.	Annexure –Report No 7&8, Soil Dumping Location  7A Approved soil dumping locations by KUDIFC	ECOP-6.0 Waste Management	DBOT	DBOE/PIU
4.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management GLSR-2ML</li> <li>Excavated Earth : 3112 CuM</li> <li>Backfilled: 545 CuM</li> </ul>	Designated location for excess soil shifting is identified. This will avoid space constraint during construction.  Implementation of Excavated	Annexure- Report No 7 &8, Soil Dumping Location	5.13.5 Disposal of excavated materials, Vol-2;	DBOT	DBOE/PIU

	<ul style="list-style-type: none"> <li>Surplus Soil : 2567 CuM.</li> </ul>	<p>Earthwork Soil Storage and Disposal Management Plan</p> <p>Surplus soil will be deposited at designated locations.</p> <ul style="list-style-type: none"> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>		ECOP. 11.0 Road, Transport and Road Traffic Management.		
5.	<ul style="list-style-type: none"> <li>Labour Mobilization for construction works.</li> <li>Labour Strength : 20 to 15 Nos</li> </ul>	<ul style="list-style-type: none"> <li>At site, 1 bathroom and 1 toilets to be arranged.</li> <li>Labours from nearby Workmen camp to be transported by passenger vehicles to site.</li> </ul>	Annexure – Report No-10, Labour Management	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
6.	<ul style="list-style-type: none"> <li>Material stack at drainage side will disturb the city drainage.</li> </ul>	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> <li>Materials/Debris not be stacked nearby drainage location.</li> </ul>	N/A	ECOP 3.0: Construction Camp Management	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"> <li>Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> <li>Implementation of Traffic Management Plan, Vehicles Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health & Safety.  5.14.5 Public Safety, Vol-2, Part-3	DBOT	DBOE/PIU
8.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities,</li> <li>This will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Peptalk.</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU
9.	<ul style="list-style-type: none"> <li>Accident Prevention against Electrical Hazard</li> </ul>	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		GLSR (H-PIP1) HDMC additional (New construction) - C-64				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increased noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear mufflers and workers to control noise. Regular maintenance of vehicles <ul style="list-style-type: none"><li>Maintain Noise level within permissible limits.</li></ul>	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increase in Dust levels due to earth work	<ul style="list-style-type: none"><li>Air Monitoring and Conformance to standards and norms.</li><li>Water the material stockpiles, access roads and bare soils on an as required basis to minimize dust</li></ul>	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	Accumulation of construction waste in the site cause land pollution / Soil Pollutions.	Waste Management Plan and Implementation.	Annexure –Report No 7&8, Soil Dumping Location  7A Approved soil dumping locations by KUDIFC	ECOP-6.0 Waste Management	DBOT	DBOE/PIU
4.	<ul style="list-style-type: none"><li>Debris , Excavated Earth Management GLSR-2.5 ML</li><li>Excavated Earth : 4269 CuM</li><li>Backfilled: 500 CuM</li><li>Surplus Soil : 3769 CuM.</li></ul>	Designated location for excess soil shifting is identified. This will avoid space constraint during construction.  Implementation of Excavated Earthwork Soil Storage and Disposal Management Plan  Surplus soil will be deposited at designated locations. <ul style="list-style-type: none"><li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li></ul>	Annexure- Report No 7 &8, Soil Dumping Location	5.13.5 Disposal of excavated materials, Vol-2;  ECOP. 11.0 Road, Transport and Road Traffic Management.	DBOT	DBOE/PIU
5.	<ul style="list-style-type: none"><li>Labour Mobilization for construction works.</li><li>Labour Strength : 20 to 15 Nos</li></ul>	<ul style="list-style-type: none"><li>At site, 1 bathroom and 1 toilets to be arranged.</li><li>Labours from nearby Workmen camp to be transported by passenger vehicles to site.</li></ul>	Annexure – Report No-10, Labour Management	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
6.	<ul style="list-style-type: none"><li>Material stack at drainage side will disturb the city drainage.</li></ul>	<ul style="list-style-type: none"><li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li><li>Materials/Debris not be stacked nearby drainage location.</li></ul>	N/A	ECOP 3.0: Construction Camp Management	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"><li>Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.</li></ul>	<ul style="list-style-type: none"><li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li><li>Provide Hard Barricades, Safety Signage Boards.</li><li>Implementation of Traffic Management Plan, Vehicles</li></ul>	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health & Safety.	DBOT	DBOE/PIU

		<ul style="list-style-type: none"> <li>Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>		5.14.5 Public Safety, Vol-2, Part-3		
8.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities,</li> <li>This will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Peptalk.</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU
9.	<ul style="list-style-type: none"> <li>Accident Prevention against Electrical Hazard</li> </ul>	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		ELSR Karwar Road (New construction) - C-70				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increased noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear mufflers and workers to control noise. Regular maintenance of vehicles  Maintain Noise level within permissible limits.	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increase in Dust levels due to earth work	<ul style="list-style-type: none"> <li>Air Monitoring and Conformance to standards and norms.</li> <li>Water the material stockpiles, access roads and bare soils on an as required basis to minimize dust</li> </ul>	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	Accumulation of construction waste in the site cause land pollution / Soil Pollutions.	<ul style="list-style-type: none"> <li>Designated location for excess soil shifting is identified. This will avoid space constraint during construction.</li> </ul>	Annexure – Report No 7&8, Soil Dumping Location  7A Approved soil dumping locations by KUDIFC	ECOP-6.0 Waste Management	DBOT	DBOE/PIU
4.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management ELSR</li> <li>Excavated Earth : 965</li> </ul>	Designated location for excess soil shifting is identified. This will avoid space constraint during construction.	Annexure- Report No 7 &8, Soil Dumping	5.13.5 Disposal of excavated	DBOT	DBOE/PIU



	<p>CuM</p> <ul style="list-style-type: none"> <li>Backfilled: 547 CuM</li> <li>Surplus Soil : 418 CuM.</li> </ul>	<p>Implementation of Excavated Earthwork Soil Storage and Disposal Management Plan</p> <p>Surplus soil will be deposited at designated locations.</p> <ul style="list-style-type: none"> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	Location	<p>materials, Vol-2;</p> <p>ECoP. 11.0 Road, Transport and Road Traffic Management.</p>		
5.	<ul style="list-style-type: none"> <li>Labour Mobilization for construction works.</li> <li>Labour Strength : 20 to 15 Nos</li> </ul>	<ul style="list-style-type: none"> <li>At site, 1 bathroom and 1 toilets to be arranged.</li> <li>Labours from nearby Workmen camp to be transported by passenger vehicles to site.</li> </ul>	Annexure – Report No-10, Labour Management	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
6.	<ul style="list-style-type: none"> <li>Material stack at drainage side will disturb the city drainage.</li> </ul>	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> <li>Materials/Debris not be stacked nearby drainage location.</li> </ul>	N/A	ECoP 3.0: Construction Camp Management	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"> <li>Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> <li>Implementation of Traffic Management Plan, Vehicles Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>	Report No-25, SOP for ELSR	<p>ECoP 10.0: Public and Worker's Health &amp; Safety.</p> <p>5.14.5 Public Safety, Vol-2, Part-3</p>	DBOT	DBOE/PIU
8.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities,</li> <li>This will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Peptalk.</li> </ul>	Report No-25, SOP for ELSR	ECoP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU
9.	<ul style="list-style-type: none"> <li>Accident Prevention against Electrical Hazard</li> </ul>	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> </ul>	Report No-25, SOP for ELSR	ECoP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		ELSR FCI Location (Keshwapur) (New construction) C-72				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increased noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear mufflers and workers to control noise. Regular maintenance of vehicles  Maintain Noise level within permissible limits.	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increase in Dust levels due to earth work	<ul style="list-style-type: none"> <li>Air Monitoring and Conformance to standards and norms.</li> <li>Water the material stockpiles, access roads and bare soils on an as required basis to minimize dust</li> </ul>	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	Accumulation of construction waste in the site cause land pollution / Soil Pollutions.	Waste Management Plan and Implementation.  Designated location for excess soil shifting is identified. This will avoid space constraint during construction.	Annexure – Report No 7&8, Soil Dumping Location  7A Approved soil dumping locations by KUDIFC	ECOP-6.0 Waste Management	DBOT	DBOE/PIU
4.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management ELSR-1ML</li> <li>Excavated Earth :867 CuM</li> <li>Backfilled: 659 CuM</li> <li>Surplus Soil : 208 CuM.</li> </ul>	Designated location for excess soil shifting is identified. This will avoid space constraint during construction.  Implementation of Excavated Earthwork Soil Storage and Disposal Management Plan  Surplus soil will be deposited at designated locations.  <ul style="list-style-type: none"> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	Annexure- Report No 7 &8,Soil Dumping Location	5.13.5 Disposal of excavated materials, Vol-2;  ECOP. 11.0 Road, Transport and Road Traffic Management.	DBOT	DBOE/PIU
5.	<ul style="list-style-type: none"> <li>Labour Mobilization for construction works.</li> <li>Labour Strength : 20 to 15 Nos</li> </ul>	<ul style="list-style-type: none"> <li>At site, 1 bathroom and 1 toilets to be arranged.</li> <li>Labours from nearby Workmen camp to be transported by passenger vehicles to site.</li> </ul>	Annexure – Report No-10, Labour Management	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
6.	<ul style="list-style-type: none"> <li>Material stack at drainage side will disturb the city drainage.</li> </ul>	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> <li>Materials/Debris not be stacked nearby drainage location.</li> </ul>	N/A	ECOP 3.0: Construction Camp Management	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"> <li>Unprotected Deep Excavation during constructing of structure. This will cause Fall of</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's	DBOT	DBOE/PIU

	labors, Visitors, Vehicles, Equipment.	Signage Boards. • Implementation of Traffic Management Plan, Vehicles Parking • Visitor Induction and Site Logistic Layout Plan.		Health & Safety.  5.14.5 Public Safety, Vol-2, Part-3		
8.	• Failure to follow safety measures while working at Height activities, • This will cause workplace incident and injury to workmen.	• Scaffolding to use for work at Height activity. • Height Work Permit system, • Handrails in platform, • Full Body Safety Harness, • Safety Net arrangement, • Working at Height Pass, • Basic PPEs, Training, Peptalk.	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU
9.	• Accident Prevention against Electrical Hazard	• Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity. • Work to Permit for Electrical Works. • Insulation mats shall be placed in front of Electrical Panels • Industrial type sockets and plug top. • Electrical safety Inspection Report • FRP type Ladder only to be used. • Competent Electrician. • Monthly Joint Electrical Inspection by P&M Engineer with EHS. • LOTO System.	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU

	<b>SCHEME COMPONENT →</b>	<b>GLSR Krishnapur Ext. (Pre-existing),            ELSR (H-P1P2) Mahadevi layout-Pre-existing            ELSR-Murariji Nagar Ext-Pre-existing            ELSR-Nehru Nagar Ext.-Pre-existing            ELSR-Nekar Nagar Ext.-Pre-existing            GLSR (H-P1P2)-NR Betta Circular- Pre-existing            GLSR (H-Demo) NR Betta Demo-Pre-existing            GLSR-NR Betta OLD-Pre-existing            ELSR-SM Krishna Nagar Ext.-Pre-existing            ELSR Sun City Ext.-Pre-existing            ELSR (H-P1P1) Tabibland 1 (Pre-existing)            ELSR (H-P1P1) Tabibland 2 (Pre-existing)            GLSR-RAYAPUR MBR (Pre-existing)            GLSR-RAYAPUR VILLAGE (Pre-existing)            ELSR Bharati Nagar (Pre-existing) ( C-73 To C-82, C-84, C-85, C-89, C-90, C-91)</b>				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Rehabilitation work.	Implementation as per agreed IIP.	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
2.	Increase in Dust levels due to earth work or Civil works	• Air pollution control measure like water sprinkling • Use of barriers to reduce exposure, if required • Plants, machinery, and equipment may be handled to minimize generation of dust	Annexure,  Report No 29, Environmental	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU

			Monitoring			
3.	Increased noise levels due to movement of machinery, equipment, and vehicles	<p>Providing Operators /drivers ear muffers and workers to control noise. Regular maintenance of vehicles</p> <p>Maintain Noise level within permissible limits.</p>	<p>Report No 29,</p> <p>Environmental Monitoring</p>	<p>ECOP 12.0 Environmental Monitoring and Audit</p>	DBOT	DBOE/PIU
4.	Temporary disruption of water supply to city	<ul style="list-style-type: none"> <li>Rehabilitation Work Plan to be implemented.</li> <li>Alternate water supply arrangement to be provided if required.</li> <li>Prior Intimation to Public through electronic and print media.</li> </ul>	<p>Report No-28</p> <p>Arrangement for Water Supply</p>	<p>ECOP 10.0 Public and Workers Health and Safety</p>	DBOT	DBOE/PIU
5.	Accumulation of Construction waste	<ul style="list-style-type: none"> <li>Dumping the construction waste at approved location and reuse for the construction work.</li> </ul>	<p>Annexure – Report No 7&amp;8, Soil Dumping Location</p> <p>7A Approved soil dumping locations by KUDIFC</p>	<p>5.13.5 Disposal of excavated materials</p>	DBOT	DBOE/PIU
6.	Unavailability of lightning arrestor, infrastructure may subject to high voltage during lightnings	<ul style="list-style-type: none"> <li>Installation of copper bonded 17X1000 mm Air termination rod with base and tapered tip with multiple points and Earth strip 25X6 -2 no's including earth pits, may subjected to changes w.r.t IIP approval.</li> </ul>	<p>Annexure, Picture 41 – Lighting Arrestor</p>	<p>ECOP 10.0 Public and Workers Health and Safety</p>	DBOT	DBOE/PIU
7.	Manhole cover Missing	<ul style="list-style-type: none"> <li>CI Man hole covers of size 1.0mX1.0m with necessary reinforcement and MS frame heavy duty angle of size 50X50X6 mm thick fixed around the edges of the slab with locking arrangement.</li> </ul>	N/A	<p>ECOP 10.0 Public and Workers Health and Safety</p>	DBOT	DBOE/PIU
8.	Usage of water structures for longer periods may result in formation of slush, alage, debris, may result in deteriorating water quality.	<ul style="list-style-type: none"> <li>Cleaning of tanks including removal of slush, algae, debris, without interfere with supply schedule as per KUDIFC guidelines.</li> </ul>	N/A	<p>ECOP 10.0 Public and Workers Health and Safety</p>	DBOT	DBOE/PIU
9.	Improper access – Damaged & corroded ladders, missing of hand rails may result in slip/trip even a fall of person/material hazard.	<p>Ladders are to be repaired or replaced with new ladders at all locations, may subjected to changes w.r.t IIP approval.</p> <p>Steel Ladder are to be adequately tied to the staging, if vertical ladders of length more than 6m are provided safety cages shall start from 3m. (IS 11682-1985)</p> <p>Work at height pass to be issued before allowing the workmen above 1.5 mtr.</p> <ul style="list-style-type: none"> <li>Rectification works to be carried out as per work at height procedures.</li> </ul>	<p>Annexure Report 45</p> <p>Work at height safety measures for all type of height works</p>	<p>ECOP 10.0 Public and Workers Health and Safety</p>	DBOT	DBOE/PIU

SCHEME COMPONENT → ELSR SUN CITY (NEW CONSTRUCTION) C-83						
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increased noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear mufflers and workers to control noise. Regular maintenance of vehicles  Maintain Noise level within permissible limits.	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increase in Dust levels due to earth work	<ul style="list-style-type: none"> <li>Air Monitoring and Conformance to standards and norms.</li> </ul> Water the material stockpiles, access roads and bare soils on an as required basis to minimize dust	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	Accumulation of construction waste in the site cause land pollution / Soil Pollutions.	Waste Management Plan and Implementation.  Designated location for excess soil shifting is identified. This will avoid space constraint during construction.	Annexure – Report No 7&8, Soil Dumping Location  7A Approved soil dumping locations by KUDIFC	ECOP-6.0 Waste Management	DBOT	DBOE/PIU
4.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management ELSR-1ML</li> <li>Excavated Earth : 867 CuM</li> <li>Backfilled: 659 CuM</li> <li>Surplus Soil : 208 CuM.</li> </ul>	Designated location for excess soil shifting is identified. This will avoid space constraint during construction.  Implementation of Excavated Earthwork Soil Storage and Disposal Management Plan  Surplus soil will be deposited at designated locations.	Annexure- Report No 7 &8, Soil Dumping Location	5.13.5 Disposal of excavated materials, Vol-2.  ECOP. 11.0 Road, Transport and Road Traffic Management.	DBOT	DBOE/PIU
5.	<ul style="list-style-type: none"> <li>Labour Mobilization for construction works.</li> <li>Labour Strength : 20 to 15 Nos</li> </ul>	<ul style="list-style-type: none"> <li>At site, 1 bathroom and 1 toilets to be arranged.</li> <li>Labours from nearby Workmen camp to be transported by passenger vehicles to site.</li> </ul>	Annexure – Report No-10, Labour Management and Labour Transportation	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
6.	Material stack at drainage side will disturb the city drainage.	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> <li>Materials/Debris not be stacked nearby drainage location.</li> </ul>	N/A	ECOP 3.0: Construction Camp Management	DBOT	DBOE/PIU

7.	<ul style="list-style-type: none"> <li>Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> <li>Implementation of Traffic Management Plan, Vehicles Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>	Report No-25, SOP for ELSR	ECoP 10.0: Public and Worker's Health & Safety.  5.14.5 Public Safety, Vol-2, Part-3	DBOT	DBOE/PIU
8.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities,</li> <li>This will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Peptalk.</li> </ul>	Report No-25, SOP for ELSR	ECoP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU
9.	<ul style="list-style-type: none"> <li>Accident Prevention against Electrical Hazard</li> <li>Lightning arrestor</li> </ul>	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> <li>Lightning arrestor to be provided once construction of ELSR is done.</li> </ul>	Report No-25, SOP for ELSR	ECoP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		ELSR-APMC (NEW CONSTRUCTION) C-86				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increased noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear mufflers and workers to control noise. Regular maintenance of vehicles  Maintain Noise level within permissible limits.	Report-29, Environmental Monitoring Plan.	ECoP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increase in Dust levels due to earth work	<ul style="list-style-type: none"> <li>Air Monitoring and Conformance to standards and norms.</li> <li>Water the material stockpiles, access roads and bare soils on an as required basis to minimize dust</li> </ul>	Report-29, Environmental Monitoring Plan.	ECoP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	Accumulation of construction waste in the site cause land pollution / Soil	Waste Management Plan and Implementation.	Annexure – Report No 7&8, Soil	ECoP-6.0 Waste	DBOT	DBOE/PIU

	Pollutions.	Designated location for excess soil shifting is identified. This will avoid space constraint during construction.	Dumping Location  7A Approved soil dumping locations by KUDIFC	Management		
4.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management ELSR-2.5ML</li> <li>Excavated Earth : 1957 CuM</li> <li>Backfilled: 1113 CuM</li> <li>Surplus Soil : 844 CuM.</li> </ul>	<p>Designated location for excess soil shifting is identified. This will avoid space constraint during construction.</p> <p>Implementation of Excavated Earthwork Soil Storage and Disposal Management Plan.</p> <p>Surplus soil will be deposited at designated locations.</p> <p>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</p>	Annexure- Report No 7 &8, Soil Dumping Location	5.13.5 Disposal of excavated materials, Vol-2;  ECOP. 11.0 Road, Transport and Road Traffic Management.	DBOT	DBOE/PIU
5.	<ul style="list-style-type: none"> <li>Labour Mobilization for construction works.</li> <li>Labour Strength : 20 to 15 Nos</li> </ul>	<ul style="list-style-type: none"> <li>At site, 1 bathroom and 1 toilets to be arranged.</li> <li>Labours from nearby Workmen camp to be transported by passenger vehicles to site.</li> </ul>	Annexure – Report No-10, Labour Management	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
6.	<ul style="list-style-type: none"> <li>Material stack at drainage side will disturb the city drainage.</li> </ul>	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> <li>Materials/Debris not be stacked nearby drainage location.</li> </ul>	N/A	ECOP 3.0: Construction Camp Management	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"> <li>Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> <li>Implementation of Traffic Management Plan, Vehicles Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health & Safety.  5.14.5 Public Safety, Vol-2, Part-3	DBOT	DBOE/PIU
8.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities,</li> <li>This will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Pep talk.</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU
9.	<ul style="list-style-type: none"> <li>Accident Prevention against Electrical Hazard</li> </ul>	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU



		<ul style="list-style-type: none"> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> </ul>				
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SCHEME COMPONENT →		GLSR APMC (NEW CONSTRUCTION)- C-87				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increased noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear mufflers and workers to control noise. Regular maintenance of vehicles <ul style="list-style-type: none"> <li>Maintain Noise level within permissible limits.</li> </ul>	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increase in Dust levels due to earth work	<ul style="list-style-type: none"> <li>Air Monitoring and Conformance to standards and norms.</li> </ul> Water the material stockpiles, access roads and bare soils on an as required basis to minimize dust	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	Accumulation of construction waste in the site cause land pollution / Soil Pollutions.	Waste Management Plan and Implementation.  Designated location for excess soil shifting is identified. This will avoid space constraint during construction.	Annexure –Report No 7&8, Soil Dumping Location  7A Approved soil dumping locations by KUDIFC	ECOP-6.0 Waste Management	DBOT	DBOE/PIU
4.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management GLSR-2.5ML</li> <li>Excavated Earth : 4269 CuM</li> <li>Backfilled: 500 CuM</li> <li>Surplus Soil : 3769 CuM.</li> </ul>	Designated location for excess soil shifting is identified. This will avoid space constraint during construction.  Implementation of Excavated Earthwork Soil Storage and Disposal Management Plan  Surplus soil will be deposited at designated locations. <ul style="list-style-type: none"> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	Annexure- Report No 7 &8, Soil Dumping Location	5.13.5 Disposal of excavated materials, Vol-2;  ECoP. 11.0 Road, Transport and Road Traffic Management.	DBOT	DBOE/PIU
5.	<ul style="list-style-type: none"> <li>Labour Mobilization for construction works.</li> <li>Labour Strength : 20 to 15 Nos</li> </ul>	<ul style="list-style-type: none"> <li>At site, 1 bathroom and 1 toilets to be arranged.</li> <li>Labours from nearby Workmen camp to be transported by passenger vehicles to site.</li> </ul>	Annexure – Report No-10, Labour Management	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

6.	<ul style="list-style-type: none"> <li>Material stack at drainage side will disturb the city drainage.</li> </ul>	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> <li>Materials/Debris not be stacked nearby drainage location.</li> </ul>	N/A	ECOP 3.0: Construction Camp Management	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"> <li>Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> <li>Implementation of Traffic Management Plan, Vehicles Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health & Safety.  5.14.5 Public Safety, Vol-2, Part-3	DBOT	DBOE/PIU
8.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities,</li> <li>This will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Peptalk.</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU
9.	<ul style="list-style-type: none"> <li>Accident Prevention against Electrical Hazard</li> </ul>	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		GLSR NAVNAGAR (NEW CONSTRUCTION)- C-88				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Increased noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear muffers and workers to control noise. Regular maintenance of vehicles <ul style="list-style-type: none"> <li>Maintain Noise level within permissible limits.</li> </ul>	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
2.	Increase in Dust levels due to earth work	<ul style="list-style-type: none"> <li>Air Monitoring and Conformance to standards and norms.</li> <li>Water the material stockpiles, access roads and bare soils on an as required basis to minimize dust</li> </ul>	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU

3.	Accumulation of construction waste in the site cause land pollution / Soil Pollutions.	Waste Management Plan and Implementation.  Designated location for excess soil shifting is identified. This will avoid space constraint during construction.	Annexure – Report No 7&8, Soil Dumping Location  7A Approved soil dumping locations by KUDIFC	ECoP-6.0 Waste Management	DBOT	DBOE/PIU
4.	<ul style="list-style-type: none"> <li>Debris , Excavated Earth Management GLSR-2.5ML</li> <li>Excavated Earth :4269 CuM</li> <li>Backfilled: 500CuM</li> <li>Surplus Soil : 3769CuM.</li> </ul>	<p>Designated location for excess soil shifting is identified. This will avoid space constraint during construction.</p> <p>Implementation of Excavated Earthwork Soil Storage and Disposal Management Plan</p> <p>Surplus soil will be deposited at designated locations.</p> <ul style="list-style-type: none"> <li>Driver code of conduct &amp; Road Safety shall be ensured while conveying the surplus soil.</li> </ul>	Annexure- Report No 7 &8, Soil Dumping Location	<p>5.13.5 Disposal of excavated materials, Vol-2;</p> <p>ECoP. 11.0 Road, Transport and Road Traffic Management.</p>	DBOT	DBOE/PIU
5.	<ul style="list-style-type: none"> <li>Labour Mobilization for construction works.</li> <li>Labour Strength : 20 to 15 Nos</li> </ul>	<ul style="list-style-type: none"> <li>At site, 1 bathroom and 1 toilets to be arranged.</li> <li>Labours from nearby Workmen camp to be transported by passenger vehicles to site.</li> </ul>	Annexure – Report No-10, Labour Management and Labour Transportation	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
6.	<ul style="list-style-type: none"> <li>Material stack at drainage side will disturb the city drainage.</li> </ul>	<ul style="list-style-type: none"> <li>Site Drainage to be connected to open drain or sewer outside the ELSR site premises.</li> <li>Materials/Debris not be stacked nearby drainage location.</li> </ul>	N/A	ECoP 3.0: Construction Camp Management	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"> <li>Unprotected Deep Excavation during constructing of structure. This will cause Fall of labors, Visitors, Vehicles, Equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of Excavation safety Measures, Excavation Checklist, Work permits.</li> <li>Provide Hard Barricades, Safety Signage Boards.</li> <li>Implementation of Traffic Management Plan, Vehicles Parking</li> <li>Visitor Induction and Site Logistic Layout Plan.</li> </ul>	Report No-25, SOP for ELSR	<p>ECoP 10.0: Public and Worker's Health &amp; Safety.</p> <p>5.14.5 Public Safety, Vol-2, Part-3</p>	DBOT	DBOE/PIU
8.	<ul style="list-style-type: none"> <li>Failure to follow safety measures while working at Height activities,</li> <li>This will cause workplace incident and injury to workmen.</li> </ul>	<ul style="list-style-type: none"> <li>Scaffolding to use for work at Height activity.</li> <li>Height Work Permit system,</li> <li>Handrails in platform,</li> <li>Full Body Safety Harness,</li> <li>Safety Net arrangement,</li> <li>Working at Height Pass,</li> <li>Basic PPEs, Training, Peptalk.</li> </ul>	Report No-25, SOP for ELSR	ECoP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU

9.	<ul style="list-style-type: none"> <li>Accident Prevention against Electrical Hazard</li> </ul>	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> </ul>	Report No-25, SOP for ELSR	ECOP 10.0: Public and Worker's Health & Safety	DBOT	DBOE/PIU
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SCHEME COMPONENT →		Pipelines – RWTM, CWTM, Distribution Networks (Pre-existing) C-93 (RWTM-29 KM;CWTM&DN- 1723)				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Damaging the Underground Utilities	<ul style="list-style-type: none"> <li>Check the Utility using UG detector</li> <li>Joint inspection with Concerned agency</li> </ul>	Report No -36 SOP for Leak rectification works  Picture – 31  SOP – Leak Rectification Works	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
2.	Increased noise levels due to movement of heavy vehicles and construction equipment	Providing Operators /drivers ear mufflers and workers to control noise. Regular maintenance of vehicles <ul style="list-style-type: none"> <li>Maintain Noise level within permissible limits.</li> </ul>	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
3.	Increase in Dust levels due to earth work	<ul style="list-style-type: none"> <li>Air Monitoring and Conformance to standards and norms.</li> <li>Water the material stockpiles, access roads and bare soils on an as required basis to minimize dust</li> </ul>	Report-29, Environmental Monitoring Plan.	ECOP 12.0 Environmental Monitoring and Audit	DBOT	DBOE/PIU
4.	Water Leakage from Pipe, disturbing public and Road user cause incident and inconvenience	<ul style="list-style-type: none"> <li>Repair the pipe immediately and avoid contamination.</li> <li>Dewater the workplace by Pump.</li> <li>Dewatering pump shall be secured so that it does not fall inside the trench</li> <li>A suitable location for the discharge of pumped water shall be identified</li> </ul>	N/A	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
5.	Dewatering work	Ensure dewatering the area by using a capable pipeline with respect to	N/A	ECOP 10.0 Public and	DBOT	DBOE/PIU

		the rating of the pump, and the outlet connected to nearby drainage/ suitable way and ensure that the water from outlet do not cause damage to the works, crops or any other property		Workers Health and Safety		
6.	Water Contamination	Repair the pipe immediately and avoid contamination.	Report No -36 SOP for Leak rectification works	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
7.	Unprotected Excavation and Trenching cause public or animal to fall and injury	<ul style="list-style-type: none"> <li>• Provide Hard Barricades.</li> <li>• Signage Poster around the excavation.</li> <li>• Light Blinkers in night if excavation not backfilled.</li> <li>• As maximum as possible excavations shall be backfilled after completing work.</li> </ul>	Report No - 36SOP for Leak rectification works	ECOP 10.0 Public and Workers Health and Safety;  5.14.5 Public Safety, Vol- 2, Part-3	DBOT	DBOE/PIU
8.	Unprotected deep excavation cause soil collapse	<ul style="list-style-type: none"> <li>• Provide Shoring Box for more than 1.5 M deep excavation.</li> <li>• If is less than 1.5 M also according to location shoring may be required to avoid soil collapse.</li> <li>• Other methods slopping and benching as per soil condition, angle of repose to be considered.</li> </ul>	Report No -36 SOP for Leak rectification works	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
9.	Welding / Hot work for repairing the pipe nearby utility such as Gas lines cause fire and explosion	<ul style="list-style-type: none"> <li>• Use UG Utility or do trial pit.</li> <li>• Joint inspects with concerned agency.</li> <li>• Use fire blankets over the gas pipelines where welding works planned to carry out for MS Pipe repairing.</li> <li>• Hot work permit.</li> <li>• Fire extinguisher in place.</li> </ul>	Report No -36 SOP for Leak rectification works	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
10.	Working in narrow road cause hindrance for Public.	<ul style="list-style-type: none"> <li>• Positioning the Traffic Marshal</li> <li>• Use the Barricades boards make isolation of working zone from trespasser, Vehicle movement.</li> <li>• Display the caution Board / signage Board.</li> <li>• Implement Traffic Management Plan.</li> <li>• If it is center of the road, Traffic flow should be diverted after approval from concerned authority.</li> <li>• Enforce the site security system to avoid unauthorized person entry in site.</li> </ul>	Report No -36 SOP for Leak rectification works	ECOP 10.0 Public and Workers Health and Safety  5.14.5 Public Safety, Vol- 2, Part-3	DBOT	DBOE/PIU
11.	Fall of Material to inside the chamber/Excavation	Stack the excavated soil minimum 2 meter away from edges.	Report No -36 SOP for Leak rectification	ECOP 10.0 Public and Workers	DBOT	DBOE/PIU

			works	Health and Safety		
12.	Welding Work / Hot Work in Wet Condition cause electric Risk	<ul style="list-style-type: none"> <li>Dewater the location.</li> <li>Use dry sand and FRP platform / insulated mat over the dry area.</li> <li>Welder PPEs to be provided.</li> </ul>	Report No -36 SOP for Leak rectification works	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
13.	Fire and Explosion in Gas Cutting work if any combustible work nearby	<ul style="list-style-type: none"> <li>ABC fire extinguisher in place.</li> <li>Do not keep any flammables near by welding works.</li> </ul>	Report No -36 SOP for Leak rectification works	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
14.	Flying objects/ sparks cause injury to public while grinding operation	<ul style="list-style-type: none"> <li>Use grinding machine without defect.</li> <li>Ensure grinding wheel RPM and machine RPM.</li> <li>Check grinding wheel within expiry date.</li> <li>Power cables shall not be exposed to wet condition and check insulation/ cables condition.</li> </ul>	Report No -36 SOP for Leak rectification works	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
15.	Public exposed to Excavator / earth moving equipment	<ul style="list-style-type: none"> <li>Provide barricades</li> <li>Use excavator after due inspection</li> <li>Operator should be having valid driving license</li> <li>Excavator have reverse horn and other</li> </ul>	Report No -36 SOP for Leak rectification works	5.14.5 Public Safety, Vol-2, Part-3; ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
16.	Leakage spot adjacent to Electric Poles / under Overhead Lines cause electrical hazard	<ul style="list-style-type: none"> <li>Before start work, communicate to concerned department.</li> <li>Arrange for shut down if required</li> <li>Work permit for excavation.</li> <li>Maintain the distance between the equipment and poles as per IE rules.</li> </ul>	Report No -36 SOP for Leak rectification works	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
17.	Illegal Power supply/House service connections	Use DG set for power supply with Portable Industrial Cord or IP 65 DB Board with RCCB switch 30 MA and Industrial Plug and socket, Cable Joints.	Report No -36 SOP for Leak rectification works	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
18.	Lifting and Lower of pipes cause fall of pipe	<ul style="list-style-type: none"> <li>Use suitable rated Crane</li> <li>Slings and Tools / Tackles are having valid TPI and Good condition and suitable SWL.</li> </ul>	Report No -36 SOP for Leak rectification works	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
19.	Sudden flow of water in pipe line cause risk for welder if not shut down the valve properly or by mistake of others to operate.	Use LOTO system in Mechanical valves/ Electrical systems	Report No -36 SOP for Leak rectification works	ECOP 10.0 Public and Workers Health and	DBOT	DBOE/PIU

				Safety		
20.	Excavation without barricade cause incident	If Excavation not backfilled due to any reason, Hard Barricades with Interlocking to be arranged.  5.2.1 Signage board in place.	Report No -36 SOP for Leak rectification works	5.14.5 Public Safety, Vol-2, Part-3	DBOT	DBOE/PIU
21.	Inconvenient for working gang if no resources or transport arrangement for material shifting	All required resources to be arranged and maintain the same.	Report No -36 SOP for Leak rectification works	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU



## OPERATIONS PHASE

### 5.3 OPERATIONS PHASE

**Table No-11,  
COMPONENT WISE OPERATION STAGE IMPACTS**

COMMONWEALTH WATER OPERATIONS STAGE EXTRACTS						
	SCHEME COMPONENT →	INTAKE JACKWELL AT SAVDATTI (Pre-existing)				
		CLEAR WATER PUMPHOUSE FOR DHARWAD-AMMINBHAVI (Pre-existing)				
		CLEAR WATER PUMPHOUSE FOR HUBLI-AMMINBHAVI (Pre-existing)				
		Raw water pumping station for dharwad 1-Savdatti (Pre-existing)				
		Raw water pumping station 2 for Hubli-Savdatti (Pre-existing)				
		Pipe carrying bridge (Pre-existing) (O-1, O-7, O-8, O-9, O-10, O-92)				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex- No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Prevention of Fall during inspection and maintenance	<ul style="list-style-type: none"><li>Manhole cover / Checker Plate</li><li>Periodical Inspection and Maintenance of Civil structures</li><li>Slippery signage boards</li><li>PPEs to be worn by all workmen in Pump House</li><li>Life Buoy Rings and Safety Gadgets</li><li>Access ladder at sump entry.</li></ul>	Report No-22SOP WTP O&M  Report No-24SOP Pump House and Electrical	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
2.	Inspection and Maintenance of Electrical equipment's	<ul style="list-style-type: none"><li>Rubber Insulated Mat to be provided In front of DB Panels.</li><li>Unwanted Materials not to be stacked around the panel.</li><li>No Unauthorized Signage Board to be displayed in Electrical Room.</li><li>Preventive maintenance in Place</li><li>Voltage Rated Hand Gloves to be maintained at Electrical Room for use.</li><li>Single line diagram to be displayed.</li><li>Lock out and Tag out (LOTO) in Place</li><li>Electrical Work Permit in Place</li><li>Earth Discharge Rod and Electrical Safety Training to Team.</li></ul>	Report No-22SOP WTP O&M  Report No-24SOP Pump House and Electrical	EcoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
3.	Inspection and Maintenance of Mechanical Equipment	<ul style="list-style-type: none"><li>Preventive Maintenance to be planned and implemented.</li><li>Rotating Parts are guarded.</li></ul>	N/A	EcoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
4.	Waste handling and Disposal	<ul style="list-style-type: none"><li>Waste Management Plan in place.</li><li>Waste Collection Bins to be provided in Pump Houses</li><li>Segregate the wastes and dispose to authorized agency.</li></ul>	N/A	EcoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
5.	Inspection and Maintenance of Water	<ul style="list-style-type: none"><li>Underground Sump/ GLSR are confined space,</li><li>Confined space safety measures to be</li></ul>	Report No-22SOP WTP O&M	EcoP 10.0 Public and Workers	DBOT	DBOE/PIU

	Reservoirs / Sumps	<p>followed.</p> <ul style="list-style-type: none"> <li>Multi Gas Detector in place, Local Exhaust Ventilation/ Air Blower system to be arranged for ventilation during working in confined space.</li> <li>SCBA and Emergency handling Kit in place.</li> <li>Motion Scout / Motion sensor</li> <li>Confined Space Work Permit</li> <li>Confined Space SOP in place.</li> </ul>	Report No-24 SOP Pump House and Electrical	Health and Safety		
6.	<ul style="list-style-type: none"> <li>Building Maintenance and Working at Height works</li> <li>Operation of 20T capacity EOT</li> </ul>	<p>Working at more than 1.8 Meter consider as work at Height activity</p> <p>Height Work Permit</p> <p>Height Work SOP</p> <p>TPI to be obtained for EOT</p> <p>Mobile Scaffolding with Handrails / FRP Ladder in place</p> <p>Full Body Harness and Lifeline Rope in place.</p> <p>Skill Pass for workmen.</p> <p>Safety Net where required, it will be used.</p>	<p>Report No-22SOP WTP O&amp;M</p> <p>Report No-24SOP Pump House and Electrical</p>	EcoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
7.	<ul style="list-style-type: none"> <li>Wet condition due to Leakages.</li> </ul>	Rectifying the leakages immediately.	N/A	Volume 3 Clause 52. Schedule 10 B	DBOT	DBOE/PIU
8.	<ul style="list-style-type: none"> <li>Absence of rainwater collection pipes in Hubli control room</li> </ul>	Replacing rainwater collection pipes with new one to provide safe disposal of water	N/A	Volume 3 Clause 52. Schedule 10 B	DBOT	DBOE/PIU
9.	<ul style="list-style-type: none"> <li>Air cracks on walls of storeroom</li> </ul>	Providing of cement slurry & sealing the openings	N/A	Volume 3 Clause 52. Schedule 10 B	DBOT	DBOE/PIU
10.	<ul style="list-style-type: none"> <li>Absence of exhaust fan</li> </ul>	Installation of exhaust fan with all necessary electrical connection	N/A	Volume 3 Clause 52. Schedule 10 B	DBOT	DBOE/PIU
11.	<ul style="list-style-type: none"> <li>Absence of supporting pillar for Dharwad Pump No-1</li> </ul>	Providing supporting pillar with reinforcement for firm support.	N/A	Volume 3 Clause 52. Schedule 10 B	DBOT	DBOE/PIU
12.	<ul style="list-style-type: none"> <li>Unauthorized access</li> </ul>	Providing precast boundary wall (3M height) for the entire intake premises for making it a restricted premises as a part of water security with necessary steel gates wherever necessary.	Report No-22-SOP for WTP O&M	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		WATER TREATMENT PLANT-AMMINBHAVI (New construction)- O-3				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Accident Prevention against Mechanical Material Handling	<ul style="list-style-type: none"> <li>Unloading of Rebars using spreader beam by mobile crane.</li> <li>Material Handling Permit system.</li> <li>Lifting Plan to be prepared</li> <li>Competent Riggers and Crane Operators to be deployed.</li> <li>Skill Pass and Specific Medical test for the Crane Operators and Riggers are followed.</li> <li>Safe Load Indicators and Load chart are available in crane to aware on safe load handling for operator.</li> <li>Tag lines to be used to avoid load oscillation</li> <li>Tools and Tackles Inspection Register</li> </ul> <p>All the lifting and tackles, Lifting Equipment to be certified by the Govt. Approved Third Party/Competent Person.</p>	<p>Annexure-Report No-21, SOP For WTP Civil Activities</p> <p>Picture No-15, Material Handling Safety Measures</p>	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
2.	Accident Prevention against Electrical Hazard	<ul style="list-style-type: none"> <li>Power supply for the machine shall be from IP-55/65/67 supply distribution board through RCCB of 30mA sensitivity.</li> <li>Work to Permit for Electrical Works.</li> <li>Insulation mats shall be placed in front of Electrical Panels</li> <li>Industrial type sockets and plug top.</li> <li>Electrical safety Inspection Report</li> <li>FRP type Ladder only to be used.</li> <li>Competent Electrician.</li> <li>Monthly Joint Electrical Inspection by P&amp;M Engineer with EHS.</li> <li>LOTO System.</li> </ul>	<p>Annexure-Report No-21, SOP For WTP Civil Activities</p> <p>Picture No - 19, Electrical Safety Measure,</p>	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		WATER TREATMENT PLANT-1, 2 & 3 AMMINBHAVI (Pre-existing)- O-4, O5, O6				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Prevention of Fall during inspection / Sample collections across the tanks in WTP	<ul style="list-style-type: none"> <li>Handrails are provided.</li> <li>Periodical Inspection and Maintenance of Civil structures</li> <li>Slippery signage boards</li> <li>PPEs to be worn by all workmen in WTP</li> </ul>	<p>Report No-22,</p> <p>SOP WTP O&amp;M</p> <p>Report No-24</p> <p>SOP Pump House and Electrical</p>	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
2.	Storage of Chlorine Tonners	<ul style="list-style-type: none"> <li>Chlorine Tonners Empty and Filled tonner to be stacked separately.</li> <li>Inspection of Tonners physical condition during unloading at WTP.</li> <li>If any defect on tonners, it is not unloaded and return to supplier.</li> <li>Hydro Test of Tonners to be verified during unloading.</li> </ul>	Report No-23 Chlorination room modification work	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

		<ul style="list-style-type: none"> <li>No Un authorized Person entry signage board in Chlorine tonner room.</li> </ul>				
3.	Handling of Chlorine Tonners	<ul style="list-style-type: none"> <li>Use Lifting Hoisting equipment for shifting of Tonners along with spreader beam/ Tools and Tackles.</li> </ul>	Report No-22,  SOP WTP O&M  Picture No-27  Chlorine& laboratory safety measures	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
4.	Neutralization and Scrubber system	<ul style="list-style-type: none"> <li>Ensure Neutralization pit filled with Caustic soda solution.</li> <li>Barricaded around the Neutralization Pit.</li> <li>Signage Board to be displayed</li> <li>Preventive maintenance of Scrubber unit.</li> </ul>	Report No-22,  SOP WTP O&M	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
5.	Chlorine Gas Leak detection and Emergency arrangement	<ul style="list-style-type: none"> <li>Chlorine Leak Detector and sensor in place.</li> <li>Periodically calibrate the Instruments as per Manufacturer Instruction.</li> <li>Inspection and maintenance of Eye wash and Shower station.</li> <li>Inspect and Maintenance of Chlorine Emergency Kit.</li> <li>Inspect and Maintenance of Chlorine Emergency Personal Protective Equipment.</li> <li>Ammonium Torch to be available.</li> <li>Canister Mask with respirator to be used up to 2 PPM by operator when inside the chlorine dosing room</li> <li>If Emergency raised, use Self Contained Breathing apparatus.</li> </ul>	Report No-22,  SOP WTP O&M  Picture No-29  O&M Before after safety measures	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
6.	Inspection and Maintenance of Electricals	<ul style="list-style-type: none"> <li>Rubber Insulated Mat to be provided In front of DB Panels.</li> <li>Unwanted Materials not to be stacked around the panel.</li> <li>No Unauthorized Signage Board to be displayed in Electrical Room.</li> <li>Preventive maintenance in Place</li> <li>Voltage Rated Hand Gloves to be maintained at Electrical Room for use.</li> <li>Single line diagram to be displayed.</li> <li>Lock out and Tag out (LOTO) in Place</li> <li>Electrical Work Permit in Place</li> <li>Earth Discharge Rod and Electrical Safety Training to Team.</li> </ul>	Report No-22,  SOP WTP O&M  Report No-24  SOP Pump House and Electrical	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
7.	Inspection and Maintenance of Mechanical Equipment	<ul style="list-style-type: none"> <li>Preventive Maintenance to be planned and implemented.</li> <li>Rotating Parts are guarded.</li> </ul>	Report No-22,  SOP WTP O&M  Report No-24  SOP Pump House and Electrical	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
8.	Working in Laboratory and handling of	<ul style="list-style-type: none"> <li>Ensure the containers are labelled in laboratory.</li> <li>Spill prevention Kit in place</li> <li>Safe Electrical Cable routing and plug points for laboratory equipment.</li> </ul>	Report No-22,	ECOP 10.0 Public and Workers Health and	DBOT	DBOE/PIU

	equipment	<ul style="list-style-type: none"> <li>• Availability of MSDS for all chemicals.</li> <li>• Necessary PPEs to be worn by Chemist.</li> </ul>	SOP WTP O&M  Picture No-27  Chlorine & laboratory safety measures	Safety		
9.	Waste handling and Disposal	<ul style="list-style-type: none"> <li>• Waste Management Plan in place.</li> <li>• Waste Collection Bins to be provided in Laboratory and other places in WTP.</li> <li>• Segregate the wastes and dispose to authorized agency.</li> </ul>	Report No-22,  SOP WTP O&M  Report No-24  SOP Pump House and Electrical	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
10.	Inspection and Maintenance of Water Reservoirs / Sumps	<ul style="list-style-type: none"> <li>• Underground Sump/ GLSR are confined space,</li> <li>• Confined space safety measures to be followed.</li> <li>• Multi Gas Detector in place, Local Exhaust Ventilation/ Air Blower system to be arranged for ventilation during working in confined space.</li> <li>• SCBA and Emergency handling Kit in place.</li> <li>• Motion Scout / Motion sensor</li> <li>• Confined Space Work Permit</li> <li>• Confined Space SOP in place.</li> </ul>	Report No-22,  SOP WTP O&M  Report No-24  SOP Pump House and Electrical	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
11.	Building Maintenance and Working at Height works	Working at more than 1.8 Meter consider as work at Height activity  Height Work Permit  Height Work SOP  Mobile Scaffolding with Handrails / FRP Ladder in place  Full Body Harness and Lifeline Rope in place.  Skill Pass for workmen.  Safety Net where required, it will be used.	Report No-22,  SOP WTP O&M  Report No-24  SOP Pump House and Electrical	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
12.	Sludge Handling	Sludge handling and Disposal	Report No-22,  SOP WTP O&M  Report No-24  SOP Pump House and Electrical, 44 Report 44 Proposed Sludge drying bed for existing & proposed WTP	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

13.	Poor Housekeeping	<ul style="list-style-type: none"> <li>Must follow up-to-date housekeeping procedures.</li> </ul>				
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<b>SCHEME COMPONENT →</b>	<b>RAW WATER TRANSMISSION MAIN, SAVADATTI TO AMMINBHAVI WTP(CHAINAGE 0 TO CHAINAGE 29510) (NEW CONSTRUCTION) - O-11</b>
	<b>CLEAR WATER TRANSMISSION MAIN, AMMINBHAVI WTP TO RAYAPUR(CHAINAGE 0 TO CHAINAGE 17712-1219mm Dia.) (864mm dia.-4749Rm)(762 mm dia.-10749Rmtr.)-(NEW CONSTRUCTION) -O-12</b>
	<b>DI PIPELAYING OF 102 KM at HUBLI &amp; DHARWAD (NEW CONSTRUCTION) O-13</b>
	<b>HDPE PIPELAYING OF 2493 KM at HUBLI &amp; DHARWAD (NEW CONSTRUCTION)- O-14</b>

No.	ESHS Issues	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Emergency communication system for flooding due to Newly laid/Existing MS pipe joint failures During operation	Emergency response plan to be prepared for communicating with valve operators to close the valves as earliest possible	Annexure- Report No-05  Emergency Response Procedure	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

<b>SCHEME COMPONENT →</b>	<b>All type of ELSR's &amp; GLSR's- Pre-existing (O-38 To O-40, O-43 To O-46, O-48 To O-54, O-57, O-58, O-61, O-65 To O-69, O-71, O-73 To O-82, O-84, O-85, O-89 To O-91)</b>
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No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring
1.	Prevention of Fall during inspection and maintenance at sumps.	<ul style="list-style-type: none"> <li>Sump with proper manhole cover / Checker Plate</li> <li>Periodical Inspection and Maintenance of Civil structures</li> <li>Slippery signage boards</li> <li>PPEs to be worn by all workmen in Pump House</li> <li>Life Buoy Rings and Safety Gadgets</li> <li>Access ladder at sump entry.</li> </ul>	Report No-22,  SOP WTP O&M  Report No-24  SOP Pump House and Electrical	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
2.	Inspection and Maintenance of Electrical equipment's.	<ul style="list-style-type: none"> <li>Rubber Insulated Mat to be provided Infront of DB Panels.</li> <li>Unwanted Materials not to be stacked around the panel.</li> <li>No Unauthorized Signage Board to be displayed in Electrical Room.</li> <li>Preventive maintenance in Place</li> <li>Voltage Rated Hand Gloves to be maintained at Electrical Room for use.</li> <li>Single line diagram to be displayed.</li> <li>Lock out and Tag out (LOTO) in Place</li> <li>Electrical Work Permit in Place</li> </ul>	Report No-22,  SOP WTP O&M  Report No-24  SOP Pump House and Electrical	ECOP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

		<ul style="list-style-type: none"> <li>Earth Discharge Rod and Electrical Safety Training to Team.</li> </ul>				
3.	Inspection and Maintenance of Mechanical Equipment	<ul style="list-style-type: none"> <li>Preventive Maintenance to be planned and implemented.</li> <li>Rotating Parts are guarded.</li> </ul>	N/A	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
4.	Waste handling and Disposal	<ul style="list-style-type: none"> <li>Waste Management Plan in place.</li> <li>Waste Collection Bins to be provided in Pump Houses</li> <li>Segregate the wastes and dispose to authorized agency.</li> </ul>	N/A	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
5.	Inspection and Maintenance of Water Reservoirs / Sumps	<ul style="list-style-type: none"> <li>Underground Sump/ GLSR are confined space,</li> <li>Confined space safety measures to be followed.</li> <li>Multi Gas Detector in place, Local Exhaust Ventilation/ Air Blower system to be arranged for ventilation during working in confined space.</li> <li>SCBA and Emergency handling Kit in place.</li> <li>Motion Scout / Motion sensor</li> <li>Confined Space Work Permit</li> <li>Confined Space SOP in place.</li> </ul>	Report No-22,  SOP WTP O&M  Report No-24  SOP Pump House and Electrical	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
6.	Building Maintenance and Working at Height works	Working at more than 1.8 Meter consider as work at Height activity  Height Work Permit  Height Work SOP  Mobile Scaffolding with Handrails / FRP Ladder in place  Full Body Harness and Lifeline Rope in place.  Skill Pass for workmen.  Safety Net where required, it will be used.	Report No-22,  SOP WTP O&M  Report No-24  SOP Pump House and Electrical	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

SCHEME COMPONENT →		All ELSR's & GLSR's- Newly Constructed O-19, (O-31 to O-37, O-41, O-47, O-55, O-56, O-59, O-60, O-62 To O-64, O-70, O-72, O-83, O-86 To O-88)				
No.	Environmental / Social Issue	Suggested Mitigation Measure(s)	Details in Annex-No.	Contract clause ref	Responsibility	
					Execution	Monitoring



1.	Inspection and Maintenance of Water Reservoirs	<ul style="list-style-type: none"> <li>Underground Sump/ GLSR are confined space,</li> <li>Confined space safety measures to be followed.</li> <li>Multi Gas Detector in place, Local Exhaust Ventilation/ Air Blower system to be arranged for ventilation during working in confined space.</li> <li>SCBA and Emergency handling Kit in place.</li> <li>Motion Scout / Motion sensor</li> <li>Confined Space Work Permit</li> <li>Confined Space SOP in place.</li> </ul>	Report No-22,  SOP WTP O&M  Report No-24 SOP Pump House and Electrical	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU
2.	ELSR Inspection and Maintenance works, working at height	<ul style="list-style-type: none"> <li>Working at more than 1.8 Meter consider as work at Height activity</li> <li>Height Work Permit</li> <li>Height Work SOP</li> <li>Scaffolding with Handrails / FRP Ladder in place</li> <li>Full Body Harness and Lifeline Rope in place.</li> <li>Skill Pass for workmen.</li> <li>Safety Net where required, it will be used.</li> </ul>	Report No-22,  SOP WTP O&M  Report No-24  SOP Pump House and Electrical	ECoP 10.0 Public and Workers Health and Safety	DBOT	DBOE/PIU

## 6. ESHS-MSIP COMPLIANCE MONITORING

As per Appendix-1 schedule 2, Compliances to be monitored for the project level are mentioned below,

### ➤ **SEP: Stakeholder Engagement Plan**

The purpose of Stakeholder Engagement Plan (SEP) is to develop and maintain good and sustainable relationship by creating balanced values for Project stakeholders throughout the project cycle through proper identification of project stakeholders and identification of key issues of stakeholders to support the project activities.

The goal of SEP is smooth implementation of overall project activities while maintaining good relationship with external stakeholders. SEP helps the Project team to understand stakeholders' concerns and perceptions and to provide feedbacks and anticipation in a timely manner.

The detailed reports are submitted separately as Stakeholder Engagement plan.

### ➤ **Public Consultation**

- Public Consultations
- Informal meetings held with community members in the information center with representatives of community
- Monthly Community meetings
- Media gatherings and press meets
- Health topic discussions

### ➤ **Steps Followed for Dissemination of Project Information**

- Public consultations, focus group discussion, face to face interactions
- Dissemination of Project Brochures, posters or flyers prepared to visually explain the project;
- Press releases
- Public Announcements, published in local newspapers as well as on the information boards in the project area
- Information about the proposed investment project, made available at specified locations (usually the municipality) and information Centre for a specified period of time.
- Electronic media: radio, television.

### ➤ **Project level Grievance Monitoring**

It ensures that complaints and grievances are addressed in good faith and through a transparent and impartial process. It will deal with 'concerns' which are defined as questions, requests for information. If not

addressed to the satisfaction of the person or group raising the concern, then a concern may become a complaint. Concerns are not registered as a grievance but will be managed via external communications plan.

### **Grievance Redress Committee:**

The project proposes to establish a Grievance Redress Committee (GRC) to register and redress the grievances and complaints of project stakeholders and project affected persons and resolve the same. The process will promote settlement of disputes and reduce litigation. GRC will be set up at the City Corporation level with the Commissioner as head.

Normally complaints lodged with the GRC will be resolved by the Committee within 15 days or 2 weeks. In case the complaints are escalated upwards to the PMU, the resolution will be made within 30 days.

### **Documentation of the GRM Processes**

The GRCs at each level will maintain the following three Grievance Registers that would, among others, help with monitoring and evaluation of the functioning of GRCs but also to document the processes of GRCs. The Grievance Register will have the following details:

- Serial Number
- Case Number
- Name of Complainant
- Gender
- Full Address of the Complainant
- Main complaint/grievance
- List of documents attached
- History of Previous complaint/grievance, if any
- Date of receipt of complaint/grievance
- Date of acknowledgement of complaint/grievance
- Date of field investigation, if any
- Date of hearing
- Decision of GRC at that level
- Progress – redressed, pending or rejected
- Decision/Response of the complainant/grieved person
- Date, Mode and Medium of communication to complainant/grieved person
- Date of closing of complaint/grievance

### **➤ Workers' Grievance Monitoring:**

The organization shall:

(a) Internally communicate information relevant to the OH&S management system among the various levels and function of the organization, including changes to the OH&S management system, as appropriate.

(b) Ensure its communication process (es) enables workers to contribute to continual improvement.

To ensure workers participation in the process of EHS implementation through two way communication system, the sites shall be implementing EHS Suggestion boxes, which will be used for collecting all EHS related concerns, improvement points raised by workmen.

Location of EHS Suggestion box

Work locations, Workmen Habitat, Office area, Rest shelter, Canteen, First Aid center and Dinning area.

Numbering of EHS Suggestion box

Sites shall maintain a register on the locations of EHS Suggestion boxes along with numbering of each suggestion box.

Discussions: Sites shall conduct weekly discussions on the concerns raised through Suggestion boxes from all the locations.

The Site EHS Committee shall discuss the summary of findings and action taken report of weekly discussions to ensure continual improvements.

## 7. WATER QUALITY MONITORING

Bureau of Indian Standards (BIS) describes the quality parameters set for drinking water to assess the quality of water resources and to check the effectiveness of Water Treatment and Supply System by the concerned authorities. BIS gives details on the Acceptable and Permissible limits of various parameters in drinking Water for it to be potable. After SDIP Approval, the water quality test will be conducted as per Appendix 15.3, Appendix 15.5 of CPHEEO Manual.

### 7.1 Parameters to be checked as per Contract Specification:

The Water Quality Surveillance Program shall be as per the drinking water quality standards stipulated in the Bureau of Indian Standards (BIS) and the following standard guidelines.

**Table No. 12 – Parameters and frequency of testing as per the contract agreement**

Sl.No	Test Description	Parameters to be Checked	Reference code	Frequency
1.	Raw water testing at river/source	Complete physical, chemical and biological Parameters	Appendix 15.3 of CPHEEO Manual, May 1999(Pg.No.-702) Acceptance Criteria as per IS 10500 Latest revision	Once in a month
2.	Raw water testing at the inlet of Each WTPs	Complete physical, chemical Characteristics	Appendix 15.3 of CPHEEO Manual, May 1999(Pg.No.-702) Acceptance Criteria as per IS 10500 Latest revision	Once Daily

3.	Treated water testing at the inlet and outlet of each water treatment works	Complete physical, chemical Characteristics	Appendix 15.3 of CPHEEO Manual, May 1999(Pg.No.-702) Acceptance Criteria as per IS 10500 Latest revision	Once Daily
4.	Treated water testing at the inlet and outlet of each water treatment works	Bacteriological analysis	Appendix 15.5 of CPHEEO Manual, May 1999(Pg.No.-708) Acceptance Criteria as per IS 10500 Latest revision	Once Daily
5.	Treated water testing at Customer tap randomly selected	Complete physical, chemical Characteristics	Appendix 15.3 of CPHEEO Manual, May 1999(Pg.No.-702) Acceptance Criteria as per IS 10500 Latest revision	Daily ongoing activity
6.	Treated water testing at Customer tap randomly selected and rotated to cover entire service area	Residual chlorine, turbidity, and pH	Appendix 15.3 of CPHEEO Manual, May 1999(Pg.No.-702) Acceptance Criteria as per IS 10500 Latest revision	600 samples per year
7.	Treated water testing at Customer tap randomly selected and rotated to cover entire service area	Bacteriological analysis	Appendix 15.5 of CPHEEO Manual, May 1999(Pg.No.-708) Acceptance	one sample per month in alternative DMAs.
8.	Ground water testing for samples taken from tube wells and open wells	Complete physical, chemical and bacteriological characteristics	Appendix 15.3 and 15.5 of CPHEEO Manual, May 1999(Pg.No.-708) Acceptance Criteria as per IS 10500 Latest revision	Samples from each tube well and open wells in operation at the effective date and samples from respective location around the distribution network.

**Table No. 13 – Physical & Chemical parameters to be tested**

At present the Test Frequency follows:

Sl.No	Physical & Chemical Characteristics	Unit	Permissible Limit as per IS 10500:2012	Test Frequency
1	Turbidity	NTU	01 to 05	Daily
2	Taste & Odour	NA	Un objectionable	Daily
3	pH	NA	6.5 to 8.5	Daily
4	Total Dissolved solids (TDS)	mg/l	500 to 2000	Weekly
5	Total Hardness	mg/l	200 to 600	Weekly
6	Chloride	mg/l	250 to 1000	Weekly
7	Sulphate	mg/l	200 to 400	Weekly
8	Alkalinity	mg/l	200 to 600	Weekly
9	Magnesium, Mg	mg/l	30 to 100	Weekly
10	Calcium, Ca	mg/l	75 to 200	Weekly
11	Dissolved Oxygen	mg/l	>4	Weekly
12	Chlorine Demand	PPM		Daily
13	Residual chlorine	PPM		Daily
14	Bacteriological			Daily
15	Jar Test			Daily

**Table no. 14 Water Quality Test (Physical & Chemical) - Weekly Test- Sample Analysis**

**Sample Collection Location: Amminbhavi-WTP**

Sr.No	Physical & Chemical Characteristics	Unit	Permissible Limit as per IS 10500:2012	Test Value - Raw Water	Test Value - Filter Water	Test Value - Treated Water
1	Turbidity	NTU	01 to 05	7 to 25	5	2
2	Taste & Odour	NA	Un objectionable	Agreeable	Agreeable	Agreeable
3	pH	NA	6.5 to 8.5	7.69	7.65	7.66

4	Total Dissolved solids (TDS)	mg/l	500 to 2000	130	90	90
5	Total Hardness	mg/l	200 to 600	57	56	56
6	Chloride	mg/l	250 to 1000	40	20	20
7	Sulphate	mg/l	200 to 400	6	5.7	5.7
8	Alkalinity	mg/l	200 to 600	56	54	54
9	Magnesium, Mg	mg/l	30 to 100	4.86	4.86	4.62
10	Calcium, Ca	mg/l	75 to 200	15.22	14.4	14.4
11	Dissolved Oxygen	mg/l	>4	7.2	7.4	7.4
12	Chlorine Demand	PPM	--	--	0.4	--
13	Residual chlorine	PPM	--	--	--	0.8



## 8. List of Annexure-Documents

Sl.No	Annexures – Documents	Common (Project Specific) / Location Specific/L&T Procedure
1.	Approval of Construction Material sources	Common(Project Specific)
2.	SOP for Waste Management plan	Common(Project Specific)
3.	MoU with Hospitals	Common (Project Specific)
4.	Fire Extinguishers Inspection Checklist and List of Fire Extinguisher Formats	Common (Project Specific)
5.	Emergency Response Procedure	Common (Project Specific)
6.	Traffic Management Plan	Common (Project Specific)
7.	Soil Dumping Yard for disposal of excess soil	Location specific
8.	Soil Dumping request Letter	Location Specific
9.	Drinking Water Audit Checklist	Common (Project Specific)
10.	Labour Management Procedures	Common (Project Specific)
11.	Skill pass - AWork at Height Pass	Common (Project Specific)
12.	EHS Suggestion Box procedures	Common (Project Specific)
13.	Anti-Sexual Harassment circular	
14.	Communication Action Plan (Consultation)	Common (Project Specific)
15.	Incident investigation checklist	Common (Project Specific)
16.	SOP for Pathogenic Infection prevention and Control	L&T Procedure
17.	17.Tree Compensation Plan 17.A Forest clearance request letter.	Common (Project Specific)
18.	Proposed Pipeline Map	Common (Project Specific)
19.	Proposed and Existing structure	Common (Project Specific)
20.	20. Road Restoration 20.A Approved Road Cross section for Road Restoration	Common (Project Specific)
21.	SOP for WTP construction	Common (Project Specific)
22.	SOP for WTP O&M	Common (Project Specific)
23.	Chlorine room drawing with space availability	Common (Project Specific)
24.	SOP for Pump Operation and Maintenance and Electrical	Common (Project Specific)
25.	SOP for ELSR Construction works	Common (Project Specific)
26.	Electrical (33KV) pole shifting at proposed 43 MLD Amminbhavi 26 A Electrical pole shifting At Lakmanahalli	Location Specific

Sl.No	Annexures – Documents	Common (Project Specific) / Location Specific/L&T Procedure
27.	Topsoil Management	Common (Project Specific)
28.	Alternate arrangements for water supply disruption	Common (Project Specific)
29.	Environmental Monitoring Plan	Common (Project Specific)
30.	SOP HDPE Pipe Laying	Location Specific
31.	Environmental Reports baselines	Common (Project Specific)
32.	MS Pipe ICML and Guniting	Common (Project Specific)
33.	SOP DI Pipe Laying	Common (Project Specific)
34.	SOP HD Grit Blasting	Common (Project Specific)
35.	SOP for Excavation and MS pipe laying	Common (Project Specific)
36.	SOP For Leak Detection & Rectification	Common (Project Specific)
37.	MS Barricade Board Design Specifications	Common (Project Specific)
38.	SOP for MS Pipe Transportation and Handling	Common (Project Specific)
39.	Sop for COVID-19 Work resumption SOP	L&T Procedure
40.	CWTM crop compensation final sheet	Common (Project Specific)
41.	RWTM final crop compensation sheet	Common (Project Specific)
42.	Permission required details	Common (Project Specific)
43.	MOM of Corporators Orientation Program	Common (Project Specific)
44.	Proposed Sludge drying bed for Existing & proposed WTP	Common (Project Specific)
45.	Work at Height safety measures	L&T Procedure
46.	Electrical LT lines Shifting/rerouting	Common (Project Specific)
47.	Chlorine Tonner room with Neutralization pit Hubballi existing WTP	Common (Project Specific)
48.	Temporary Water source for construction works	Common (Project Specific)
49.	Existing WTP layout with emergency response details	Common (Project Specific)
50.	Design drawing of piping GA of clariflocculator	Common (Project Specific)
51.	Design specifications of sludge pump.	Common (Project Specific)
52.	Back wash collecting sump	Common (Project Specific)
53.	53. List of PPE 53.A List of PPE stock available at Site	L&T Procedure & Project Specific
54.	IIP BOQ 119 IIP Vol-1 Infrastructure Improvement Plan	Common (Project Specific)
55.	SOP of EOT crane	L&T Procedure
56.	WTP layout details with rest shed details	Common (Project Specific)
57.	ROW details	Common (Project Specific)

<b>Sl.No</b>	<b>Annexures – Documents</b>	<b>Common (Project Specific) / Location Specific/L&amp;T Procedure</b>
58.	Workforce Management Centre Plan	Common (Project Specific)
59.	Traffic Diversion plan – Hubballi (President Hotel to NR Betta Pipe laying Works)	Common (Project Specific)
60.	Resettlement plan for CWTM and RWTM respectively.	Common (Project Specific)
61.	Utilities along the alignment RWTM (61A) and CWTM (61B)	Common (Project Specific)
62.	SOP for Demolition	L&T Procedure
63.	Design specifications of Fencing at ELSR/GLSR	Common (Project Specific)
64.	Forest permission letter for tree cutting	Common (Project Specific)
65.	Crop compensation beneficiary details	Common (Project Specific)
66.	Stack emission specifications	L&T Procedure
67.	Sludge Drying Bed Design Drawing	Common (Project Specific)

## 9. List of Pictures

Sl.No.	Annexures – Pictures
1.	Site layout
2.	First Aid Centre and Medical Facilities
3.	Snake Prevention Measures
4.	Fire Safety Measures
5.	Emergency Response Measures
6.	Traffic Management Implementations
7.	Environmental Parameters & Monitoring
8.	Labour Management Implementations
9.	Grievance Redressal Mechanism
10.	Incident Investigation Matrix
11.	Road Restoration
12.	EHS Trainings
13.	PPE'S Matrix
14.	COVID Precautionary Measures
15.	Material Handling Safety Measures
16.	Excavation Safety Measures
17.	Confined Space Safety Measures
18.	Safe Access & Egress Measures
19.	Electrical Safety Measures
20.	Work at Height Measures
21.	MS Pipe laying Activities
22.	DI Pipe laying Activities
23.	HDPE Laying Activities
24.	Fire Drill ,Sprinklers system at HDPE stock
25.	Grit Blasting Compliances
26.	Pipe Inter shifting Safety Measures
27.	Chlorine and Laboratory Safety Measures
28.	O&M Before & After Safety Measures
29.	Electrical Compliances -O&M
30.	PPE Compliances -O&M
31.	Leak Rectification Works
32.	Confined Space Safety Measures -O&M
33.	Windsock Safety Measures
34.	Drowning safety measures
35.	Dip Tray
36.	Scrubber unit for chlorination unit
37.	Rest shelters
38.	Specifications of Handrails
39.	Walkway paths provided for temporary purpose
40.	Work in residential areas
41.	Lighting Arrestor
42.	Security arrangement at WTP