Initial Environmental Examination

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India: Rajasthan Secondary Towns Development Sector Project – Additional Financing (PART A)

Balotra Water Supply and Wastewater Works

Prepared by Rajasthan Urban Drinking Water Sewerage and Infrastructure Corporation Limited-External Aided Project (RUDSICO-EAP) for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 31 January 2023)

Currency unit	–	Indian rupee (₹)
₹ 1.00	=	$ 0.01
$1.00	=	₹ 81.79

ABBREVIATIONS

ADB	–	Asian Development Bank
BOCW	–	Building and Other Construction Workers
CGWB	–	Central Ground Water Board
CLC	–	City Level Committee
CPCB	–	Central Pollution Control Board
CPHEEO	–	Central Public Health and Environmental Engineering Organization
CTE	–	Consent To Establish
CTO	–	Consent To Operate
CWR	–	Clear Water Reservoir
DBO	–	Design-Build-Operate
DPR	–	Detailed Project Report
EHS	–	Environmental Health and Safety
EIA	–	Environmental Impact Assessment
EMP	–	Environmental Management Plan
FAO	–	Food and Agricultural Organization
FCO	–	Fertilizer Control Ordinance
FSSM	–	Faecal Sludge and Septage Management
IEE	–	Initial Environmental Examination
LSGD	–	Local Self Government Department
MOEFCC	–	Ministry Of Environment, Forest and Climate Change
OHSR	–	Overhead Service Reservoir
PFBS	–	Pokran Falsoond Balotra Siwana Water Project
PHED	–	Public Health Engineering Department
PIU	–	Project Implementation Unit
PMU	–	Project Management Unit
PWD	–	Public Works Department
REA	–	Rapid Environmental Assessment
ROW	–	Right-Of-Way
RSPCB	–	Rajasthan State Pollution Control Board
RSTDSP	–	Rajasthan Secondary Towns Development Sector Project
RUDSICO-EAP	–	Rajasthan Urban Drinking Water Sewerage And Infrastructure Corporation Limited-Externally Aided Projects
RUDSICO	–	Rajasthan Urban Drinking Water Sewerage and Infrastructure Corporation
SCADA	–	Supervisory Control and Data Acquisition
SBR	–	Sequential Batch Reactor
SEIAA	–	State Environmental Impact Assessment Authority
SPS	–	Safeguard Policy Statement, 2009
STP	–	Sewage Treatment Plant
TEER	–	Treated Effluent Elevated Reservoir
TESR	–	Treated Effluent Storage Reservoir
ULB	–	Urban Local Body
WHO	–	World Health Organization
WTP	–	Water Treatment Plant

WEIGHTS AND MEASURES

m^3	–	cubic meter
dB	–	decibels
^oC	–	degree centigrade
dia	–	diameter
kg	–	kilogram
kl	–	kiloliter
km	–	kilometer
kmph	–	kilometer per hour
KLD	–	kiloliters per day
ha	–	hectare
HP	–	horsepower
LPCD	–	liters per capita per day
lps	–	liters per second
m	–	meter
mg	–	milligram
mm	–	millimeter
MCM	–	million cubic meter
MLD	–	million liters per day
km^2	–	square kilometer

NOTE

In this report, "$" refers to United States dollar.

CONTENTS

APPENDICES

Appendix C1 – C25 – common appendices, attached separately, provide statutory standards, guidelines, reporting templates etc. are applicable to all subproject IEEs.

EXECUTIVE SUMMARY

ADB approved a loan for the Rajasthan Secondary Towns Development Sector Project (RSTDSP, Loan 3972: IND) in September 2020. This is currently under implementation and will close by May 2028. The additional financing (the project) will expand the improved access to WSS services in at least ten urban local bodies (ULBs), benefiting 1.2 million people. Important value addition of the proposed project to the ongoing project is that it will provide innovative solutions to address climate change to respond to the growing climate risks and vulnerability and also to improve livability and prosperity through enhancing natural and/or built heritage at least ten ULBs in Rajasthan, benefiting 1.0 million people. The overall project is aligned with the following impacts: (i) access to potable, affordable, reliable, equitable, environmentally sustainable drinking water supply in all urban areas of Rajasthan improved, (ii) health status of urban population, especially the poor and under-privileged improved, and (iii) productivity, livability and prosperity for the citizens in Rajasthan cities and towns enhanced. Reflecting the additional measures to enhance climate resilience and heritage-sensitive urban development of the project, impact statement (iii) was added; the outcome statement is modified as quality, reliability, equity, and sustainability of urban assets and services in project towns of Rajasthan improved; and additional output was also added, resulting in four outputs.

Balotra is one of the project towns, and improvement of water supply and sewerage system in Balotra is proposed under the RSTDSP-AF. Following are the proposed components:

(i) **Water supply**. (i) 442.09 km of water distribution networks with HDPE 75 mm to 315 mm dia and DI 350 mm to 500 mm dia (ii) 8.38 km rising main with ductile iron (DI) K-9 150 mm to 400 mm dia (iii) installation of 04 number of pumps at Luni headwork's (H/W) and 4 number of pumps at Samdai Road headwork. (iv) construction of 02 number of consumer relation management center (CRMC) and 01 number master control center (MCC) and one chlorination room. (v) house service connections-16222 numbers (vi) upgradation of existing supervisory control and data acquisition (SCADA) system.

(ii) **Sewerage**. (i) 99.11 km sewer network with 200 mm to 350 mm dia including 3.61 km trenchless sewer line (ii) construction of manholes- 7298 numbers (iii) house service connections-6960 numbers. (iv) provision of Faecal sludge and septage management (FSSM) to provide low costs sanitation where sewer network is not an immediate requirement for population on outskirts and scattered habitation till laying of sewer line. FSSM is proposed for the ward no 32, 42 and 43 & 46 to 51. Under FSSM, procurement of desludging vehicle -1 number of 4000 kilo litre (KL) is proposed.

Screening and Categorization. assessment of potential impacts. Balotra Town Water Supply and Sewerage subproject is classified as environmental category B per ADB's Safeguard Policy Statement (SPS), 2009, and accordingly this initial environmental examination (IEE) assesses the environmental impacts and provides mitigation and monitoring measures to ensure that there are no significant impacts as a result of the subproject. As per the Government of India environmental impact assessment (EIA) Notification, 2006, subproject do not require environmental clearance.

Description of the Environment. Subproject components are in Balotra town and in its immediate surroundings which were converted into urban use for many years ago, and there is no natural habitat left at the proposed subproject sites. The subproject sites are located in existing road right of way (RoW) and government-owned lands. No new WTP or STP are proposed in the subproject. There are no trees on the site and is surrounded mostly by agricultural areas. There

are no environmentally sensitive areas, such as forests or protected areas within or close to project sites. Jasol is the nearest forest block which is located at an aerial distance of 8 km from the town. There are also no notable areas/site of cultural or historical or archaeological significance. Barmer District has no ASI monuments but having 5 nos. of state protected monuments which are : (1) Kiradu Ke Mandir –Hatama, (2) Fort Sivana, (3) Mata Ka Mandir Bisukala (4) Sun Temple Dewaka and (5) Jain Temple Juna-Patarasar. None of these monuments are located within Balotra towns.

Potential Environmental Impacts and Mitigation measures. In this draft IEE, negative impacts were identified in relation to location, design, construction, and operation of the improved infrastructure. Environmental impacts as being due to the project design or location were not significant as various measures are already included in site planning and preliminary design. No impacts on forests or archeological resources envisaged. Temporary measures suggested to avoid any disturbance / damage to buildings during laying of water lines in nearby roads. Source of water for town is Pokaran Falsoond Balotra Siwana Lift Water Supply Project (PFBS) and this PFBS has been envisaged to provide drinking water benefits to 563 villages and three towns in 2 phases and present water supply sub-project will also get water from PFBS phase-II. Presently water from Pokran - Falsoond – Balotra - Siwana Water Supply Project (PFBS) is being reaching to both head works. 450 mm DI-K9 pipe is laid from jasol phatak off take point to both head works. out of 14.50 MLD clear water about 5.50 MLD water is feeded to CWRs located at luni head works and about 9.0 MLD water is fed to CWRs located at samdari road head work with the supply of 20 hrs., from PFBS project. WTP constructed under the Pokhran-Falsoond-Balotra-Siwana (PFBS) Water Supply Scheme is the source of treated water for augmentation of Balotra Water Supply and presently providing 14.50 MLD water to the Balotra town. Raw water source is water from Indira Gandhi Munak Canal (IGMC) while the WTP of 119 MLD is situated at Biliya, Pokaran. Presently there is 9.0 MLD capacity STP based on SBR technology constructed under UIDSSMT Scheme, located at Jerla Village in Balotra Town. The STP is under operation and will be further used in Project. The present STP is meeting the stipulated discharge standards. SBR involved aerobic treatment, with minimum odour potential. Sludge management was also included in the STP presntly dried sludge is reused as manure in agricultural fields.

Potential impacts during construction are considered significant but temporary and are common impacts of construction in urban areas, and there are well developed methods to mitigate the same. Except laying of water pipelines and sewer, all other construction activities will be confined to the selected sites and the interference with the general public and community around is minimal. In these works, the temporary negative impacts arise mainly from construction dust and noise, hauling of construction material, waste and equipment on local roads (traffic, dust, safety etc.), mining of construction material, occupational health and safety (OHS) aspects. Pipe laying works will be conducted along public roads in an urban area congested with people, activities and traffic. Therefore these works may have adverse, but temporary impacts arising mainly from the disturbance of residents, businesses and traffic due to construction work; safety risk to workers, public and nearby buildings due to deep trench excavations in the road; access impediment to houses and business, disposal of large quantities of construction waste etc. Trenchless method will be adopted for sewers deeper than 3.5 m and also at main road crossings in traffic areas.

Environmental Management. An environmental management plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels, along with the delegation of responsibility to appropriate agency. Various design related measures are already included in the project design. During construction, the EMP includes mitigation measures such as (i) proper planning and scheduling of water line works to minimize public inconvenience; (ii) measures to avoid impacts on heritage building and chance find procedures (iii) barricading, dust

suppression and noise control measures; (iv) traffic management measures for works along the roads and for hauling activities; (v) occupational and community health and safety, labour welfare, (vi) provision of walkways and planks over trenches to ensure access will not be impeded; (vii) reuse of excavated materials to extent possible, (viii) spill and sediment control measures to avoid water and soil pollution, etc.,. EMP will guide the environmentally-sound construction of the subproject. EMP includes a monitoring program to measure the effectiveness of EMP implementation and include observations on- and off-site, document checks, and interviews with workers and beneficiaries. A copy of the updated EMP/ site environmental management plan (SEMP) shall be kept on-site during the construction period at all times. The EMP will be included in bids and contracts, and implementation shall be binding on contractors. Consent to operate (CTO) from Rajasthan State Pollution Control Board (RSPCB) needs to be obtained for both existing STP and WTP.

Implementation Arrangements. The executing and implementing agencies will remain unchanged from the current project, which are Government of Rajasthan's Local Self Government Department (LSGD) and Rajasthan Urban Drinking Water, Sewerage and Infrastructure Corporation (RUDSICO), respectively. The AF project retains the project management unit (PMU) at the implementing agency, as well as the two Zonal Offices in Jaipur and Jodhpur. Project implementation units (PIUs) have been established in project towns. A total of eight PIUs will manage 18 ULBs under the AF Project. Consultants will support the PMU and PIUs. Project Officer (Environment) at PMU and Safeguard and Safety Officer at each of the PIUs will be responsible for environment management and monitoring activities and will be supported by Safeguard support staff from Supervision Consultant, town staff/team and Environment Safeguard Specialist of Supervision Consultants. Contractor personnel will also include an Environment, Health and Safety (EHS) Engineer in the project construction team.

Consultation, Disclosure and Grievance Redress. The stakeholders were involved in developing the IEE. Informal and formal consultation are conducted with local population of the area at 12 places along with proposed alignment with about 93 persons in month of July and September, 2022. A town level consultation meeting was organised on 3rd May, 2023 in Nagar Parishad Meeting hall which was attended by more then 60 persons including the elected public representatives (Chairman, Municipal Council, Balotra and its Councelors), administrative officers (Additional District Megistrate and Commissioner Municipal Council, Balotra) and safeguard profesionals of CMSC-2 , CAPP experts.

A City Level Committee (CLC) was held and CLC has appreciated and approved the subproject. The IEE will be made available at public locations; this draft IEE will be disclosed to a wider audience via the ADB and RUDSICO websites. Consultation process will continue during project implementation. A grievance redress mechanism (GRM) will be established to redress public grievances.

Monitoring and Reporting. The PMU, PIU and consultants will be responsible for monitoring and reporting. During construction, results from internal monitoring by the DBO contractor will be reflected in their monthly EMP implementation reports to the PIU. PIU with the assistance of CMSC, will monitor the compliance of contractor, prepare a quarterly environmental monitoring report (QEMR) and submit to PMU. The PMU will oversee the implementation and compliance and will submit semi-annual environmental monitoring reports (SEMR) to ADB. SEMRs will be disclosed on ADB and RUDSICO websites.

Conclusions. The proposed project is unlikely to cause significant adverse impacts, and potential impacts are mainly due to construction and can be mitigated or minimized to acceptable levels

through measures included in the EMP. The citizens of the Balotra will be the major beneficiaries. The subproject is primarily designed to improve environmental quality and living conditions of Balotra Town through provision of water supply and sewerage. The benefits arising from this subproject include:(i) increased availability of potable water to all households including urban poor; (ii) reduced time and costs in accessing alternative sources of water; (iii) better public health particularly reduction in waterborne and infectious diseases; (iv) reduced risk of groundwater contamination; (v) reduced risk of contamination of treated water supplies; (vi) reduced dependence on fresh water resource due to reuse of treated wastewater, and (vii) improvement in quality of water bodies due to disposal of treated effluent meeting disposal standards.

Based on the findings of the IEE, the classification of the project as Category “B” is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS (2009) or GoI EIA Notification (2006). To conform to government guidelines, for associated facilities, the existing STP and WTP requires consent to establishment (CTE) and consent to operate (CTO) from Rajasthan Pollution Control Board. This IEE needs to be updated during the detailed design, reviewed and approved by ADB, and disclosed prior to start of construction. PMU needs to ensure that CTO is obtained for existing WTP and STP.

I. INTRODUCTION

A. Rajasthan Secondary Town Development Section Project – Additional Financing

1. Sector Project (RSTDSP, Loan 3972:IND) from its regular ordinary capital resources on 25 September 2020 and became effective on 4 January 2021. The closing date of the current project is 31 May 2028. This project is on track and has performed well consistently since the first quarter of 2021. Under this project, water supply systems are being improved in eight urban local body (ULB) towns (Output 1), and sanitation systems in 13 ULBs (Output 2). During the implementation, an additional 13 ULBs were added to the project for fecal sludge and septage management system development. Under Output 3, capacity building and training activities on sustainable and resilient water supply and sanitation (WSS) operations, hygiene, gender equality and social inclusion conducted.

2. The additional financing (the project) will expand the improved access to WSS services in at least ten urban local bodies (ULBs), benefiting 1.2 million people. Important value addition of the proposed project to the ongoing project is that it will provide innovative solutions to address climate change to respond to the growing climate risks and vulnerability and also to improve livability and prosperity through enhancing natural and/or built heritage at least ten ULBs in Rajasthan, benefiting 1.0 million people. The overall project is aligned with the following impacts: (i) access to potable, affordable, reliable, equitable, environmentally sustainable drinking water supply in all urban areas of Rajasthan improved, (ii) health status of urban population, especially the poor and under-privileged improved, and (iii) productivity, livability and prosperity for the citizens in Rajasthan cities and towns enhanced. Reflecting the additional measures to enhance climate resilience and heritage-sensitive urban development of the project, impact statement (iii) was added; the outcome statement is modified as quality, reliability, equity, and sustainability of urban assets and services in project towns of Rajasthan improved; and additional output was also added, resulting in four outputs.

(i) **Output 1: Resilient water supply systems developed or improved.** By 2028, the project will (i) At least 1,300 km of water supply pipelines will be commissioned through a district-metered area approach for effective non-revenue water (NRW) management, (ii) at least 79,000 households will be connected to an improved water supply system, including at least 95% below poverty line households, with 100% functional meters allowing for the introduction of volumetric billing, (iii) three new water treatment plants (WTPs) will be commissioned with a total capacity of at least 24 million liters per day (mld).

(ii) **Output 2: Resilient and inclusive sanitation systems developed or improved.** By 2028, (i) at least 500 km of sewers will be constructed; (ii) seven sewage treatment plants (STPs) with co-treatment of wastewater and fecal sludge and with a total capacity of at least 30 mld will be commissioned and one existing STP with 10 mld capacity will be upgraded to meet current effluent standards; and (iii) at least 54,000 new household connections (including at least 95% below poverty line households) to the sewer system will be installed.

(iii) **Output 3: Urban assets to enhance climate resilience and heritage living developed or improved.** By 2028, (i) at least 50 km of drainage networks will be constructed in five ULBs; (ii) at least five either kunds or baories rehabilitated and/or reconstructed in three ULBs that were heritage structures built for drainage, rainwater harvesting, and reuse, but currently are not properly functioning; (iii) five water parks rehabilitated in one ULB to enhance water retention and storage capacity and/or to improve people's well-being, both residents and visitors; and (iv) at least four heritage structures are refurbished in five ULBs to improve the living

environment and attract more tourists.

(iv) **Output 4: Institutional and human capacities strengthened for sustainable service delivery, gender equality, and improved public health**.

3. The executing and implementing agencies will remain unchanged. GOR's Local Self Government Department (LSGD) is executing agency and the Rajasthan Urban Drinking Water, Sewerage and Infrastructure Corporation (RUDSICO) is implementing agency.

4. Balotra water supply and sewerage subproject. This is one of the subprojects proposed under RSTDSP-AF. It will improve water supply and sewerage systems in the town.

B. Purpose of Initial Environmental Examination Report

5. Per ADB's Safeguards Policy Statement, 2009, ADB requires the consideration of environmental issues in all aspects of the Bank's operations. Using rapid environmental assessment (REA) checklist (Appendix 1), subproject is unlikely to cause significant adverse impacts, and classified as category B and per ADB SPS requirements this IEE is conducted. Subproject selection confirms with EARF environmental criteria.

C. Scope of IEE

6. The subproject will be implemented under the design-build-operate (DBO) modality. Thus, this IEE is based on the preliminary project design report. The IEE is conducted mainly based on field reconnaissance surveys and secondary sources of information. Stakeholder consultation was an integral part of the IEE. This IEE will be updated during the detailed design to reflect changes and submitted to ADB for approval. IEE will be further updated during implementation if there are any changes in project scope, design or sites updates will supersede the earlier version.

D. Report Structure

7. This Report contains the following sections:

(i) Executive summary;
(ii) Introduction;
(iii) Description of the project;
(iv) Analysis of alternatives;
(v) Policy, legal and administrative framework;
(vi) Description of the environment;
(vii) Anticipated environmental impacts and mitigation measures;
(viii) Public consultation and information disclosure;
(ix) Grievance redress mechanism;
(x) Environmental management plan; and
(xi) Conclusions and recommendations.

II. DESCRIPTION OF PROJECT

A. Project Location

8. **Balotra Town:** is a town located in southwest direction of Rajasthan in the Barmer district. It is situated on the banks of the river Luni and is approximately 119 kilometers from the Jodhpur city at geographical coordinates are 25° 50' 0" North, 72° 14' 0" East. The town is known for its

textile industry, with many small-scale industries producing textiles such as bedsheets, sarees, and dress materials. The general topography of the town is flat to undulating terrain with occasional sand dunes. It has an average elevation of 106 metres (347 feet).

Figure 1: Location of Balotra Town in Rajasthan State Map

B. Existing Water Supply and Sewerage Conditions

1. Existing Water Supply

Source:

(i) Pokran Falsoond Balotra Siwana Water Project (PFBS): This scheme is supplying around 14.50 MLD of treated water at existing CWRs of Balotra located at Luni Pump House and Samdari Road Pump House from the off-take point near Jasol Phatak.

(ii) Tube wells, constructed near village Bithuja and Kitnod. From these tube wells, approx. 7 MLD of water is being drawn, but the quality of water is good due to the presence of high TDS and Chlorides. The nos. of tube wells are as under:

Detail of Existing Tube Wells

Table 1: Details of Existing Tube Wells

Sl. No.	Location	Nos.	Utilization in this project
1	Bithuja	16	Presently they are working as backup source in the case of emergency. After commissioning of PFBS water project PHED does not take water from these tube wells.
2	Kitnod	7	
	Total	**23**	

9. **Transmission Mains-** The water transmission for treated water 41 kms of DI K-9 is already laid in town from Tube well to CWR's to various OHSRs located in the city. Dia of existing lines are from 100 mm to 300 mm. All the metallic lines are proposed to be utilized in the project and 3.5 km of 250mm dia DI-K-9 will be utilized under proposed project.

10. **CWRs** – There are two Head works in the present system namely Luni Headworks and Samdari Road Head works. At these H/Ws, 4 nos. CWRS are in function along with pump houses to feed the OHSRs from where water is supplied by gravity supply. Presently water from Pokran - Falsoond – Balotra - Siwana Water Supply Project (PFBS) is being reaching to both head works. 450 mm DI-K9 pipe is laid from jasol phatak off take point to both head works. Presently out of 14.50 MLD clear water about 5.50 MLD water is feeded to CWRs located at luni head works and about 9.0 MLD water is fed to CWRs located at samdari road head work with the supply of 20 hrs., from PFBS project. The details of H/Ws and CWRs are given below.

Table 2: Details of CWRs

Sl. No.	Location of Head Works	Location of Existing CWR	Capacity of existing CWR (KL)	Year of Construction	Present Use	Condition (Based on Preliminary Inspection) and feasibility for Reuse in this project.
1	Luni H/Ws	CWRS at Luni H/Ws	600	1990	To pump treated water to ESRs.	The present condition of these CWRs is satisfactory, hence proposed to be used in this project. Some minor repairing and water proof painting is proposed.
			650	2011		
2	Samdari Road H/Ws	CWRs at Samdari Road H/Ws	1100	1990		
			1700	2018		

11. **OHSR:** There are 7 asociated OHSRs in the project of which 6 are already constructed while one is under construction. OHSRs at Luni H/W (1500 KL), City Park (850KL), Krishi Mandi (600 KL), Samdani Road H/W (400 KL), Ranuja (1750 KL) are already constructed while OHSR at Ward No. 42 is proposed details are tabulated below. The CWRs and OHSR have been constructed to meet the demand up to year 2044.

Table 3: Details of Existing OHSRs

Sl. No.	Location	Capacity of OHRs in KL	Staging in Mtr	Year of Construction	Condition (Based on Preliminary Inspection) & utility for this project.
1	At Luni H/W	1500	20	1990	Good. In running condition. Proposed to be continued after waterproof painting
2	At City Park	850	20	2015	Good. In running condition. Proposed to be continued after waterproof painting
3	At Gandhi Pura	550	20	2015	Good. In running condition. Proposed to be continued after waterproof painting
4	At ward number 42	700	20	(2023)	New construction (proposed by PHED). Work order issued.
5	Near Krishi Mandi	600	20	1990	Good. In running condition. Proposed to be continued after waterproof painting
6	At Samdari road H/Ws	400	20	1990	Good. In running condition. Proposed to be continued after waterproof painting
7	At Ranuja	1750	20	2015	Good. In running condition. Proposed to be continued after waterproof painting

12. **Distribution networks** Balotra Municipal Area is divided into 7 water supply zones; The distribution system is of AC/PVC pipes. At present around 236 Km length of distribution system of AC & PVC pipes, dia. 75/80 mm to 450 mm has been laid in town. The entire distribution system will be replaced with new pipeline.

13. **House Service Connections:** At present, the town has approximately 13947 individual water connections (Up to December 2021 Balotra town). Out of which 13429 are domestic and 518 are non-domestic.

SCADA System

14. In the SCADA system, a Master Control Center (MCC) is being established as a Central Control System (CCS), and a Local Control Centers (LCCs) at OHSRs, Pumping Stations and Distribution Network. Following results will be monitored by SCADA system:

i. Monitor and control the designated flow of CWR, water level, pressure, valve mechanism from source to distribution.
ii. Basic data to be transferred from pumping station – Flow in each pumping main, Pressure, Efficiency of pumps through signals from energy (KWH) meters installed at each outgoing feeder and multifunction meters (MFM) installed at each incoming feeder, readings of pH meters, turbidity meters and residual chlorine meters required for process monitoring will be communicated in PH to the main SCADA station.
iii. Basic data to be transferred from CWR, OHSR and DMA are CWR & OHSR water levels, DMA- pressure, flow, battery power indicators and other monitoring signals to be communicated to the respective local control centres.
iv. The butterfly valves with accoutre along with expansion joints are installed at distribution inlet of 7 OHSR (Luni HW, City Park, Gandhi pura, Ward no-42, Krishi mandi, Samdari road, Runija OHSR)

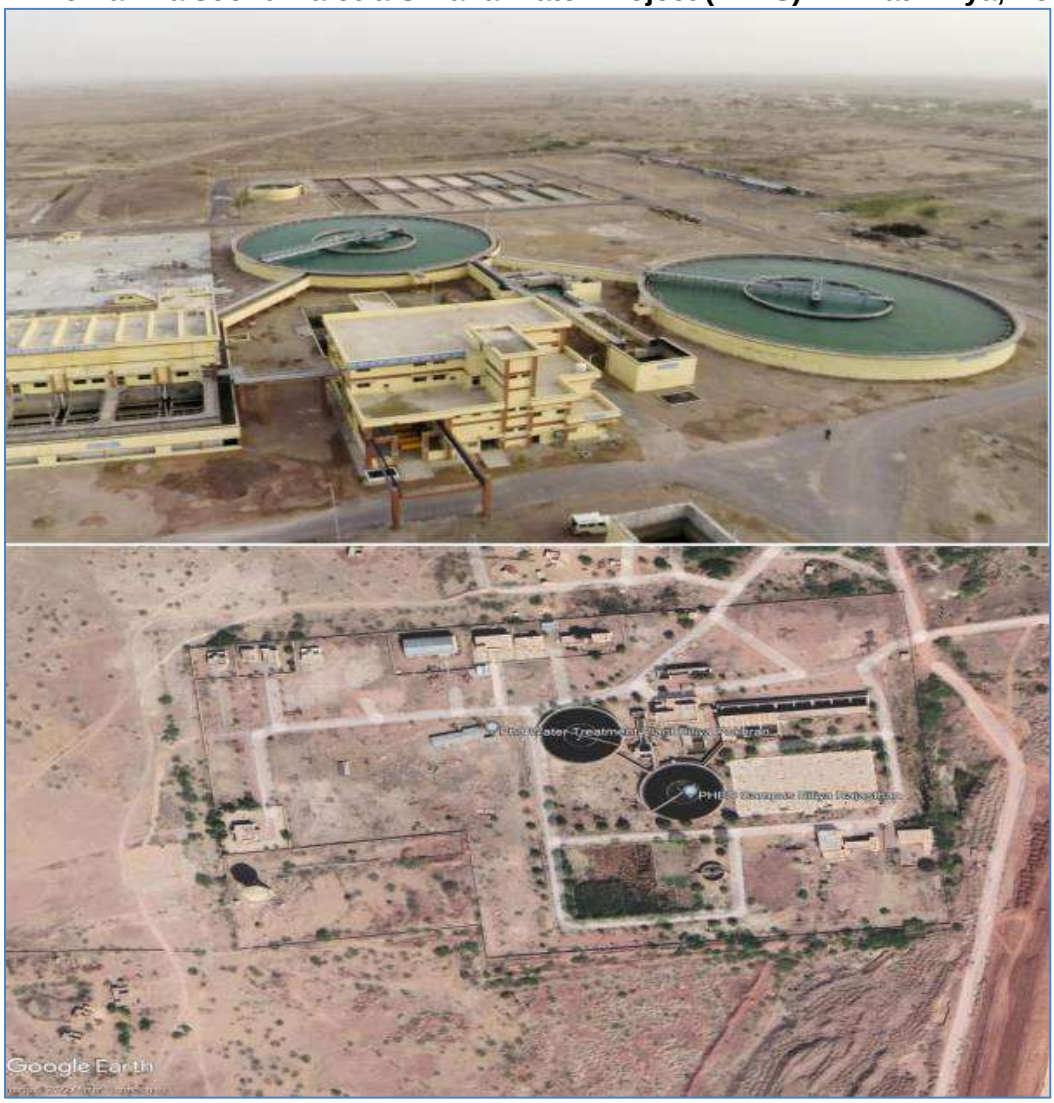
Water Supply

15. The project under RUIDP Phase-IV will include the water supply system within Balotra Municipal Limits. The project aims at improving the water supply system for project horizon 2040, strengthening distribution system, upgradation & improvement of SCADA system and establishing a continuously pressurized water supply system to the town. In view of the fund allocation for the town in the Program, the water supply project area has to be restricted to the municipal limits.

Associated Facility:

16. **WTP:** WTP constructed under the Pokhran-Falsoond-Balotra-Siwana (PFBS) Water Supply Scheme is the source of treated water for augumentation of Balotra Water Supply and presently providing 14.50 MLD water to the Balotra town. The PFBS aims to provide sustainable source of potable water supply to over a million populations of 580 villages (177 of Jaisalmer and 403 of Barmer districts) together with 4 towns namely Pokhran, Balotra, Falsoond and Siwana. Raw water source is water from Indira Gandhi Munak Canal (IGMC) while the WTP of 119 MLD is situated at Biliya, Pokaran.

Figure 2. Pokran Falsoond Balotra Siwana Water Project (PFBS) WTP at Biliya, Pokran



(Source, Balotra WS Detailed Project Report)

17. Existing Sewerage System. Balotra has 126 km of sewerage lines. Under the IHSDP Phase-1st, 71.63 km of sewerage lines have been laid during 2015-16. This can be phased as; up into 13.63 km under IHSDP, 5.0 km funded by the Municipal Fund and 53.78 km under Budget Speech of Hon'ble CM Rajasthan in the year 2012, at present sewerage system is almost commissioned including 9.0 MLD STP, currently under operation. Length of sewer line laid under existing sewerage project is 126 km having dia varying from 200 mm to 900 mm. 9.0 MLD STP based on SBR process was also constructed and is in running condition. Around 5,500 sewerage connections have been issued. Still there is no sewer collection systment in zone, newly developed areas of towns including ward no 1, 2, 3, 16, 17, 18, 19, 20, 21, 22,23,24,26,27,28, 40, and part of Ward 25). Currently in these areas, wastewater from kitchens & bathrooms is discharged into storm water drains culminating finally to the Nallah or on ground, which pollutes the environment and contaminates the ground water. As the remaining area of town does not have any sewerage system and effluent finds its way into the open drains.

Associated Facility

18. **Sewerage Treatment Plant.** Presently there is 9.0 MLD capacity STP based on SBR technology constructed under UIDSSMT Scheme, located at Jerla Village in Balotra Town. The STP is in working condition and will be further used in Project. Audit of the Existing 9 MLD STP for Balotra town is appended in **Appendix 3**.

Need of the project:

19. **Augmentation of Balotra Water Supply Scheme for Demand Load from 16.95 MLD to 19.05 MLD -** Balotra Municipal Area is divided into 7 water supply zones; this zoning was done by PHED Scheme in 2016-2018. While the water supply is being made to the entire city with the source, storage, transmission and distribution network, pipe network and consumer connections. About 236 km of water distribution network already laid in town. The existing distribution system with AC (94 km) and PVC (19.3 km) pipes are very old with heavy leakages due to breakages and joints leakages due to ageing. The old Asbestos Cement (AC) & Polyvinyl Chloride (PVC) pipelines will be replaced by the new water mains of different sizes of HDPE pipes ie 75 mm to 315 mm dia & DI pipes ie 100mm to 250mm dia. Therefore, replacement of the existing distribution network and consumer connections along with installation of new consumer meters has been proposed in this project.

C. Proposed Water Supply and Sewerage Infrastructure in Balotra under RSTDSP

20. **Status of water demand for Balotra**: Water demand for Balotra town has been calculated on the basis of 135 LPCD as per acceptable PHED, Rajasthan norms. Water demand includes domestic, industrial and fire demand of town. Presently there is no any industrial demand in Balotra and therefore only domestic and fire demand is taken for design purpose. Base year, intermediate year and ultimate year is taken as 2025, 2040 and 2055 respectively. Total water demand of the town is given below Table 2.

Table 4: Population and Water Demand and Water Availability

Year	Stage	Population	Water Demand at Consumer end	Total clear water demand (with 12% locess) in MLD	Allocated Water (MLD)
2025	Base Year	93600	12.64	14.33	14.5
2040	Intermediate Year	110740	14.95	16.95	19.56
2055	Ultimate Year	124460	16.80	19.05	19.56

21. The required water is made available from Indira Ghandhi Canal trough Pokran Falsoond Balotra Siwana Water Project (PFBS) water supply scheme. Public health engineering department, GoR has allocated 19.56 MLD treated drinking water for Balotra town (Appendix 8 water allocation letter).

22. **Proposed works under Water Supply:** The subproject is formulated to address gaps in water supply infrastructure in a holistic and integrated manner under RSTDSP. To meet out the demand up to the Ultimate Design Year 2055 under the present plan, the following components have been proposed:

- **At Luni H/W Pump House:** Required 4 nos of pumps installation for 3.97 MLD and 2.70 MLD load duly connected with Proposed suction, delivery side and Common header.

- **At Samdari road Pump House:** Required 4 nos of pumps installation for 1.09 MLD and 9.19 MLD load duly connected with Proposed suction, delivery side and Common header.
- **Transmission line:** Replacement of existing transmission line of 8,380 m .
- **Replacement of Distribution Network:** Replacement of 442.09 km HDPE and DI-K-7 distribution network in proposed in 7 zones.
- **Replacement of Consumer Water Meters:** Water meter & Meter Box-19192 Nos in 7 zones for intermediate year 2040.
- **Upgradation of SCADA System:** Additional unit of SCADA system will be installed for the new facilities being proposed and it will be integrated with the existing SCADA (under installation at present).
- **O&M:** 10 years O&M for all new constructions.

23. **Distribution Network:** The total 7 zones and 21 DMA has been provided with new **distribution** pipeline. The distribution pipelines will be completely replaced and new consumer connections along with consumer meters will be installed.

Table 7: Details of distribution network to be replaced.

S.No.	Dia. Of pipe	Material	Zone-1	Zone-2	Zone-3	Zone-4	Zone-5	Zone-6	Zone-7	Total	SAY
1	75	HDPE	39724	18384	6713	48901	6189	12645	43358	175915	175915
2	90	HDPE	18031	6026	1687	17039	5042	4132	31158	83115	83116
3	110	HDPE	13205	2691	2149	9050	4609	3744	21250	56698	56698
4	125	HDPE	17870	7054	2312	8925	2021	5529	17436	61147	61147
5	140	HDPE	6950	503	4100	15523	4113	1817	4458	37464	37465
6	160	HDPE	3439	532	707	531	771	1022	2430	9430	9431
7	180	HDPE	44	697	49	1067	0	53	1895	3806	3806
8	200	HDPE	872	76	627	0	153	0	792	2520	2520
9	225	HDPE	1162	0	0	67	540	12	2469	4250	4250
10	250	HDPE	1437	22	0	964	297	0	1386	4106	4107
11	280	HDPE	81	0	0	0	0	0	0	81	81
12	315	HDPE	0	0	78	0	16	0	812	906	906
13	350	DI	1820	0	21	0	0	0	28	1869	1869
14	400	DI	0	0	0	0	0	0	419	419	419
15	450	DI	61	0	0	0	0	0	0	61	61
16	500	DI	0	0	0	0	0	0	307	307	307
TOTAL			**104696**	**35985**	**18444**	**102067**	**23750**	**28954**	**128198**	**442094**	**442098**

24. **Replacement of Consumer Water Meters:** Water meter & Meter Box-19192 Nos. in 7 zones for intermediate year 2040.

(i) **SCADA System** For efficient & uninterrupted running of pumps at various pumping stations and at the same time ensuring the desired quantity of water to be delivered to each ESR, it is proposed to install required field instruments and communication devices connected with the Central Control System at the Pumping Stations, ESRs, Electric Substations, etc.The SCADA system envisages a Master Control Centre established at Luni H/W, Balotra, and Local Control Centres at various locations, listed below:

i. Local Control Centre located at Samdari road Head Works
ii. Local Control Centres (LCCs) located at 7 numbers ESRs.

25. The SCADA for additional facilities proposed under this project will be integrated with the existing SCADA at the Master Control Centre located at the Luni H/W, Balotra.

26. **Master Control Center** The MCC SCADA system shall consist of a high end dual redundant server system (with MS SQL database) operating on a dual redundant high speed Ethernet bus cable system and communicating with:

a) A minimum of 2 PC based operator workstations complete with 21" LCD screen, keyboard and mouse, one unit being configurable as an engineering workstation.
b) A server based large screen display system comprising 2 no 46" LCD displays.
c) Laser printers for the purposes of alarm and event reporting and for the production of reports and historical trends.
d) A server-based telecommunications system operating with ISDN and GPRS communications media.

27. **Consumer Relation Centres (CRMC)** To dealing with the consumers, two consumer relation centres have been proposed to be constructed at following locations:

- **Luni H/W Campus:** To deal with the consumers of zones 1, 2 and 3.
- **Samdari Road H/W Campus:** To deal with consumers of zones 4, 5, 6 and 7.

28. **Operation and maintenance of water supply system**. The DBO contractor will operate and maintain the system for a period of 10 years after completion of construction and commissioning the new / improved system. This will include the following:

(i) Maintenance of entire Clear water system;
(ii) Operating and maintenance of all the proposed clear water pumping stations to fill all the CWRs/OHSRs through transmission pipe lines and also direct pumping to distribution system and operation of chlorination system, maintenance of complete system and maintaining the infrastructure and maintaining the specified water levels at each of the reservoirs throughout the operation and maintenance period;
(iii) Managing the distribution network for distributing water efficiently, equitably and minimizing NRW and maintaining the infrastructure on DMA basis in the distribution network;
(iv) Providing continuous pressurized water supply with improvement in level of service on continuous basis to the connected consumers and maintaining the infrastructure while meeting the performance indicators. 12 meter (m) pressure head shall be maintained at all ferrule points;
(v) Meter reading, customer services and maintaining the infrastructure in water supply sector;
(vi) Meter reading, bimonthly billing, bill distribution, revenue collection and customer services and maintaining the infrastructure in water supply;
(vii) Sampling treated water received at all the CWRs and from random points within the zones/DMA to ensure that it meets the potable water specification and monitor on monthly basis;
(viii) Assessing and minimizing non-revenue water and locating the causes for high NRW and bringing down the NRW level within the 7% for DMA, and 15% of raw water;
(ix) Provide consumer service connections on approval or sanction by employer representative;
(x) Contractor will provide continuous on-the-job trainings that will start from the day the contractor gets mobilized, and other capacity building programs by the contractor as

important regular activities for staff of the employer, PHED and local body; and

(xi) Maintain environmental and safety norms at entire system components.

Sewerage System:

29. **Proposed Sewerage Works**. Based on the site feasibility and town topographical survey was done by the Municipal Board Consultant, it is estimated to lay the Sewer length of 99.11 km including 3.6 Km trenchless sewer lines in Balotra Town and the details of the proposed sewer lines to be laid under this project are tabulated below:

Table 8: Zone wise Length of Sewer Network

S. No.	Sewer Dia	Type of Pipe	Depth wise Sewer Network Length (mtr)					Total Length (m)
			up to 1.5 m	1.5 -3.0 m	3.0 - 4.5 m	4.5 - 6.0 m	6.0 - 7.5 m	
1	200 MM	HDPE DWC SN8	58718	33655	2064			94437
2	250 MM	HDPE PE-100/PN-6			2717	741	62	3520
3	250 MM	HDPE DWC SN8		583	344			927
4	315 MM	HDPE PE-100/PN-6			93			93
5	350 MM	RCC NP-4		130				130
Tota			**58718**	**34369**	**5218**	**741**	**62**	**99107**

Manholes - Manhole proposed in Sewer lines of various types are detailed below:

Table 9: Zone wise No of Manholes

S.No.	Sewer Dia	Type of Pipe	Depth wise Manhole (Nos)					Total MH (Nos)
			up to 1.5 m	1.5 -3.0m	3.0 - 4.5m	4.5 - 6.0m	6.0 - 7.5m	
1	200 MM	HDPE DWC SN8	4284	2510	151			6945
2	250 MM	HDPE PE-100/PN-6			205	57	4	266
3	250 MM	HDPE DWC SN8		44	26			70
4	315 MM	HDPE PE-100/PN-6			8			8
5	350 MM	RCC NP-4		9				9
Total			**4284**	**2563**	**390**	**57**	**4**	**7298**

30. **House Connections** - Providing 6960 Nos of pre-cast RCC M-40 grade circular Road Side Inspection chambers of **outside** building line and providing 110mm & 160mm dia PVC-U pipe line for collection of sewage from Road Side inspection chambers of outside building line to street manhole.

- Pre-cast RCC M-40 grade circular Road Side Inspection chamber: 6960 Nos
- House Sewer Connections inside the property boundary: 6960 Nos

The objectives of the proposed sewerage works are:

(i) Sewerage mangment in town including Septage management and decentralized wastewater treatment systems in suitable areas;

(ii) To ensure sustainability of the project by implementing a comprehensive asset management plan focusing on an integrated approach to O&M to minimize lifecycle costs.

31. The **sewer** system will be designed as a separate sewer system that carries only the domestic wastewater. The open drain system that exists in the town will cater to storm runoff. No industrial wastewater will be allowed into the sewers

32. **Sewage Flows for Different Horizon Years** as per CPHEEO Sewerage Manual, 80% of the water may be expected to reach the sewers unless there is data available to the contrary. In Balotra, it is proposed to supply the water at the rate of 135 LPCD. The expected flow of sewage be 108 LPCD, over this to account for ground water infiltration and any other unaccounted for nondomestic addition.

Projected Population of Balotra Municipal area and adjoining developed areas:

33. As per the Detailed Project Report the projected base year population of Balotra Municipality will be 88926 while in Intermediate year it will be 101873 and during ultimate design year it will reach up to 112236. However, adding the adjoining area to it, projected population in the base is 129144, intermediate design year population is 152792 and for ultimate design year it will be 171722 as shown in Table 10 (Source: Detailed Project Report, Balotra WW).

Table 10: Total Projected Population in Balotra town in Municipal Area and municipal area including adjoining developed area)

Year	Stage	Population (Municipal Area)	Population (Municipal Area & Adjoining development area)
2025	Base Year	93600	129144
2040	Intermediate Year	110740	152792
2055	Ultimate Year	124460	171722

34. **Figure 9** shows the details of zones already covered with sewerage network and proposed coverage under RUIDP Phase-IV along with zones proposed under septage management. It is evident from the figure that even after the proposed sewerage network in Balotra Town, larger area is under septage management.

35. Of the total 51 wards septage management with 4 year O&M is proposed in 16 wards (Wards: 1,2,20,22,23,24,25,26,29,30,39,40,41,43,44 and 45) while Septage management with 10 years O&M is proposed in 8 wards (Wards:32,42,46,47,48,49,50 and 51). Thus, 24 wards are proposed to be covered under septage management out of total 51 wards).

Required STP capacity:

36. The sewage generated from the intercepted area including the proposed network under RUIDP Phase-IV is 9 MLD in the base year (2025) and 10 MLD in the intermediate design year (2040) and 10.8 MLD in ultimate design year (2055) as depicted in **Table 11.** Presently there is 9.0 MLD capacity STP based on SBR technology constructed under UIDSSMT Scheme, located at Jerla Village in Balotra Town. Additional STP of 1.0 MLD capacity based on SBR process under Hybrid Annuity Model (HAM Basis) at existing STP campus in Jerla Village for Balotra town is proposed to be constructed matching to future demand of Year 2040. Further to meet the required capacity for ultimate design year (2055) the treatment capacity will be increased in future phases.

Table 11: Required STP Capacity during base, intermediate and ultimate design year

	Population			Sewage generation			Location of existing STP
STP	2025	2040	2055	2025	2040	2055	Jerla village
STP -1	79511	88258	95260	9.0	10.0	10.8	

(Source: Detailed Project Report, Balotra WW).

37. Presently there are 9.0 MLD capacities STP based on SBR technology constructed under UIDSSMT Scheme, located at Jerla Village in Balotra Town. There is no requirement of additional STP for year 2040 for Balotra town under RUIDP Phase-IV.

38. **Discharge of treated wastewater** the excess / surplus treated wastewater that is not reused will be **discharge** into into a natural drain.

39. **Operation & maintenance of sewerage system***.* The DBO contractor will operate and maintain the system for a period of 10 years after completion of construction and commissioning the new system. This will include the following:

(i) Managing the sewerage network for collection of sewage including maintenance of entire system from property chambers up to disposal outfall of Sewage to STP;
(ii) Provide house connections for collection of sewage from house properties on approval or sanction by Employer;
(iii) Contractor will provide continuous on-the-job trainings that will start from the day the contractor gets mobilized, and other capacity building programs by the contractor as important regular activities for staff of the Employer, PHED and Municipal Council / Corporation Abu road; and
(iv) Maintaining environmental norms at entire system components.

FAECAL SLUDGE MANAGEMENT

40. Faecal Sludge Management (FSM) is to provide low costs sanitation where sewer network is not an immediate requirement and make its collection, treatment and effluent management environment-friendly. Rajasthan Urban Infrastructure Development Project (RUIDP) has proposed to implement non-sewer sanitation solution to some selected pockets of the towns through Faecal Sludge and Septage Management. These pockets /areas are having the population density less than the density required to generate the sewage in sufficient quantity for piped sewer network. However, sewer network has been designed including these areas so that in future whenever required sewer network can be laid.

41. The Objective of Faecal Sludge Management (FSM) is to provide low costs sanitation where sewer network is not an immediate requirement and sewage in these areas is collected, treated and effluent is managed with environment-friendly processes.

MUNICIPAL AREA PROPOSED UNDER SEPTAGE MANAGEMENT:

42. Balotra town is having 45 municipal wards and 6 outer develop areas. There are 9 wards (32, 42,46,47,48,49,50,51 and 5 (partially) selected for FSM. which has the low density, unfavourable topography. Safe disposal of wastewater generatied from these wards is also a major problem, therefore these areas are porposed to be covered under proposed FSM in the town. The following diagram shows areas proposed with sewerage network under RUIDP PH-IV (in Green colour) and let out wards (with no colour) for FSM.

Table 12: FSSM ward and Population Covered under FSM

Ward No.	Total Area	Habitation Area	Other than Habitation Area	Projected Population			Density per hectare on Total Area			Density per hectare on Habitation Area		
	Ha.			2025	2040	2055	2025	2040	2055	2025	2040	2055
32	902.93	172.30	730.63	5129	8134	10539	**6**	9	12	**30**	47	61
42	220.42	48.10	172.32	2584	3683	4562	**12**	17	21	**54**	77	95
46	1061.20	331.12	730.08	16289	16950	17479	**15**	16	16	**49**	51	53
47	261.66	52.77	208.89	4873	5240	5534	**19**	20	21	**92**	99	105
48	168.64	48.87	119.77	2789	4492	5855	**17**	27	35	**57**	92	120
49	698.29	215.87	482.42	7152	8291	9203	**10**	12	13	**33**	38	43
50	621.00	149.04	471.96	6157	10784	14487	**10**	17	23	**41**	72	97
51	148.00	35.52	112.48	2958	5163	6929	**20**	35	47	**83**	145	195

43. Table 13 below shows the nature and size of the various civil works components of water supply and sewerage subproject in Balotra Town. Google Coordinates of proposed work sites are given in Table 14. Locations of project sites layout maps are shown in Figures 3 to 9.

Table 13: Scope of Proposed Works in Balotra Town

Infrastructure	Function	Description of works/capacity	Location and ownership
Water Supply			
Clear Water Pumping System	To provide adequate pressure in water supply system to distribute to consumers directly/transmit water to overhead tanks for gravity supply	• Luni HWs (Proposed 4 No. pumps, 1W+1S for 3.973 MLD and 1W+1S for 2.698 MLD Supply through existing/ Propsoed pumping main. • Samdari road HWs (proposed 1W+1S for 1.091 MLD and 1W+1S for 9.19 MLD)	Within existing CWRs of PHED • Luni road HWs • Samdari road HWs **Ownership- PHED**
Transmission line	Water transmission from Headworks to OHSRs	*Replacement* 8380 m total length to be replaced (150mm to 400mm DI-K-9)	Transmission pipelines will be mostly laid along the main roads. Pipes will be laid underground. **Ownership of Roads – Nagar Parishad**
Distribution System	Collect water from service reservoir and distribution to households	Replacement Length: 442.10 Kms Material: HDPE Pipe & DI-K-7 Diameter: 75mm to 315 mm Diameter 350mm to 500mm	Along existing roads of All zones **Ownership-Nagar Parishad**
House Service Connections	Connection consisting of all pipes, fittings and appurtenances from the water riser pipe to the water inlet pipe of the distribution system	19192 Nos. house water connections at 2040	**All zones Covered.** **Ownership of Roads – Nagar Parishad**
Sewerage Work			

Infrastructure	Function	Description of works/capacity	Location and ownership
Sewer Collection networks including Man holes and House sewer connections	Collect wastewater from houses and convey by a combination of gravity and pressure pumping to pumping station and ultimately to the STP.	Laying of total 99.11 km length of 200 mm to 350 mm dia including 3.6 km trenchless sewer lines HDPE PN6 & HDPE DWC SN8 pipes, RCC NP4 Manholes 7298nos House sewer connections (6960 numbers)	Sewers will be laid underground in the roads and internal streets in the town. Sewers will be located in the centre of the road. The existing/proposed water pipes are/will be located on one or either side of the roads, and therefore sewers will be laid in the centre without distributing the water pipes.
FSSM			
Truck mounted mobile desludging equipment	storage, collection, transport, treatment, and safe end use or disposal of fecal sludge.	Mobile tankers with suction and discharge arrangements and one with 4000 liter capacity. No of tankers will be worked out during final design.	Mobile Equipment

Table 14: Coordinates of Subproject Locations

COMPONENTS	Latitude	Longitude
CWR (600+650 KL) at Luni HW	25°49'8.64"N	72°14'25.47"E
CWR(1100+1700KL) at Samdari road	25°49'39.75"N	72°16'0.14"E

Figure 2 A Existing Water supply transmission from Biliya WTP to Samdari and Luni HW in Balotra

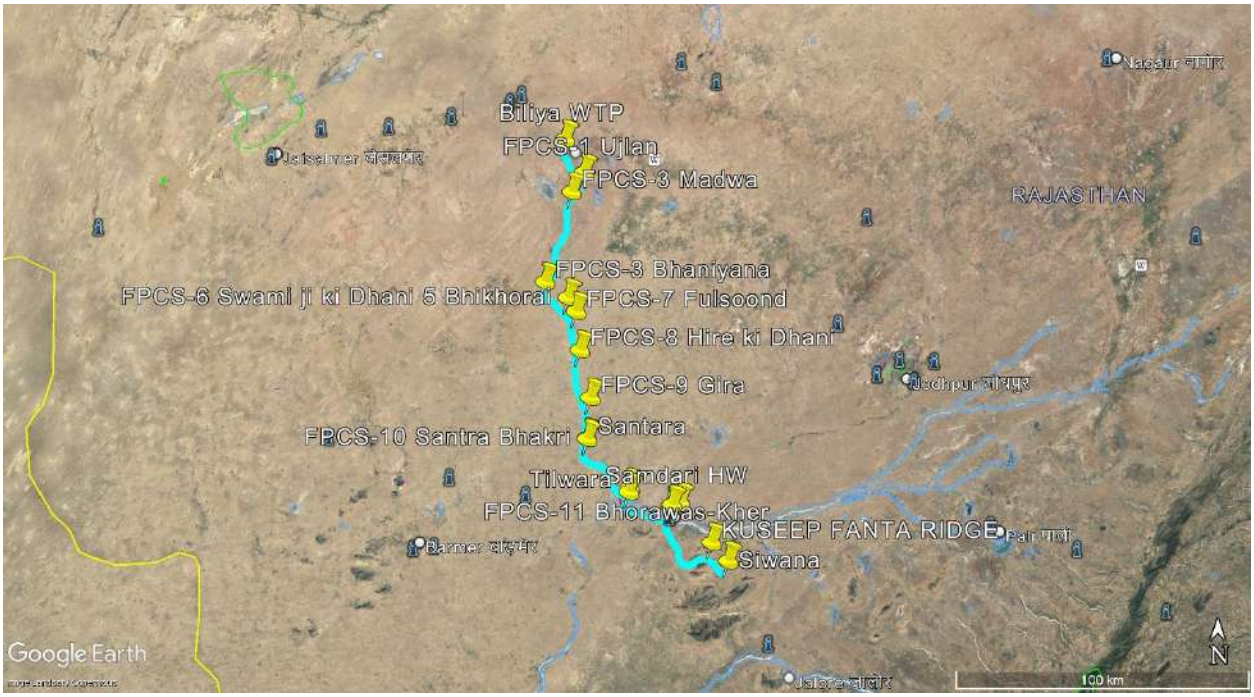


Figure 3: Existing water Supply of Balotra

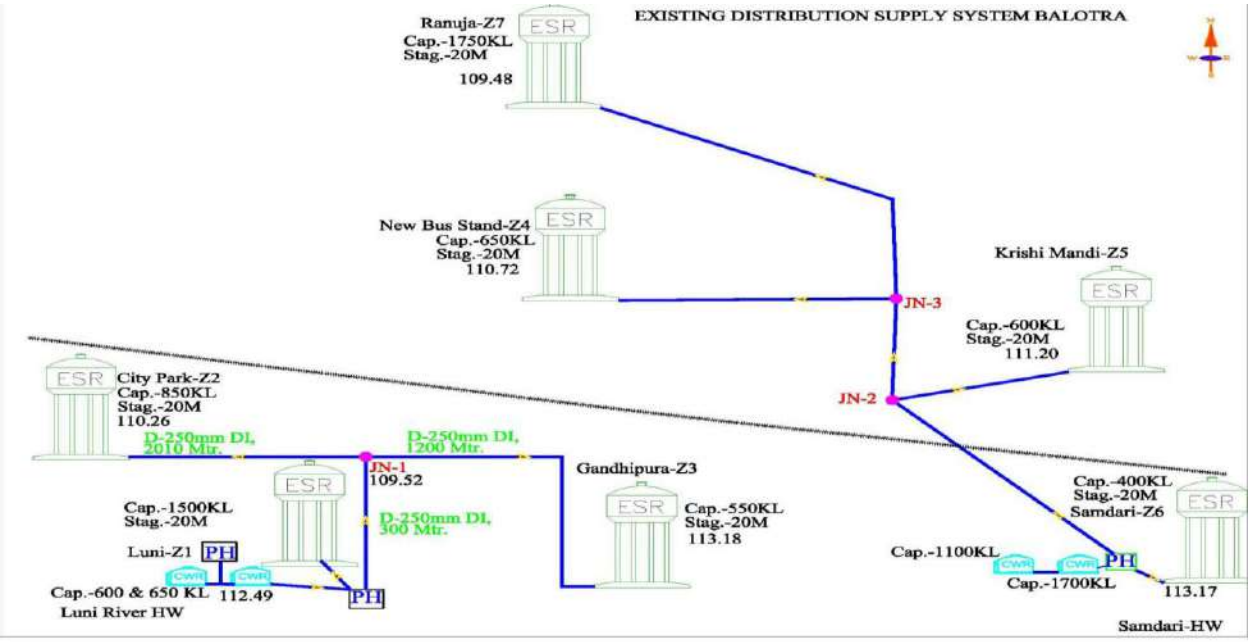


Figure 4: Schematic diagram for Water Supply Scheme at Balotra (Proposed components in green ink)

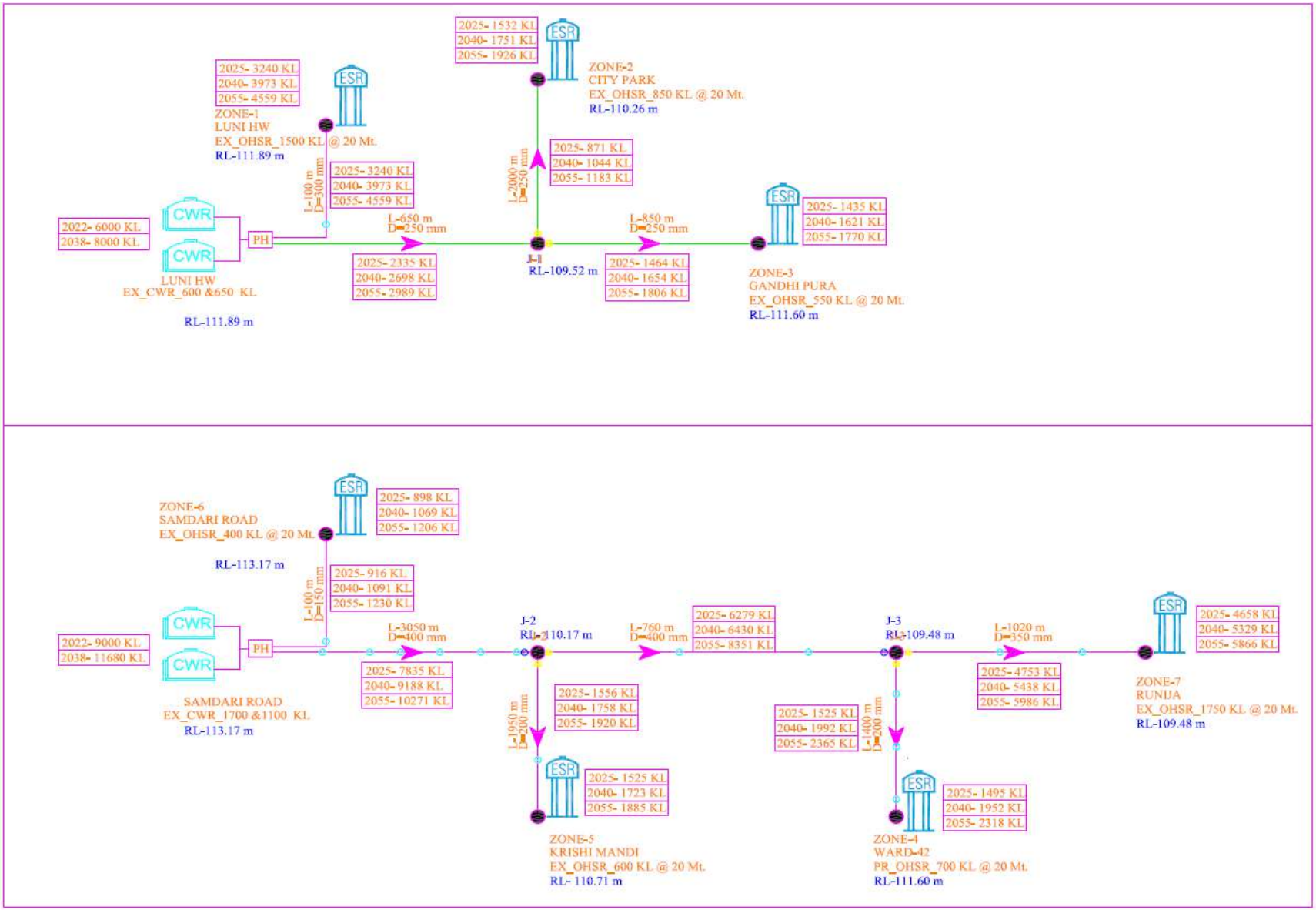
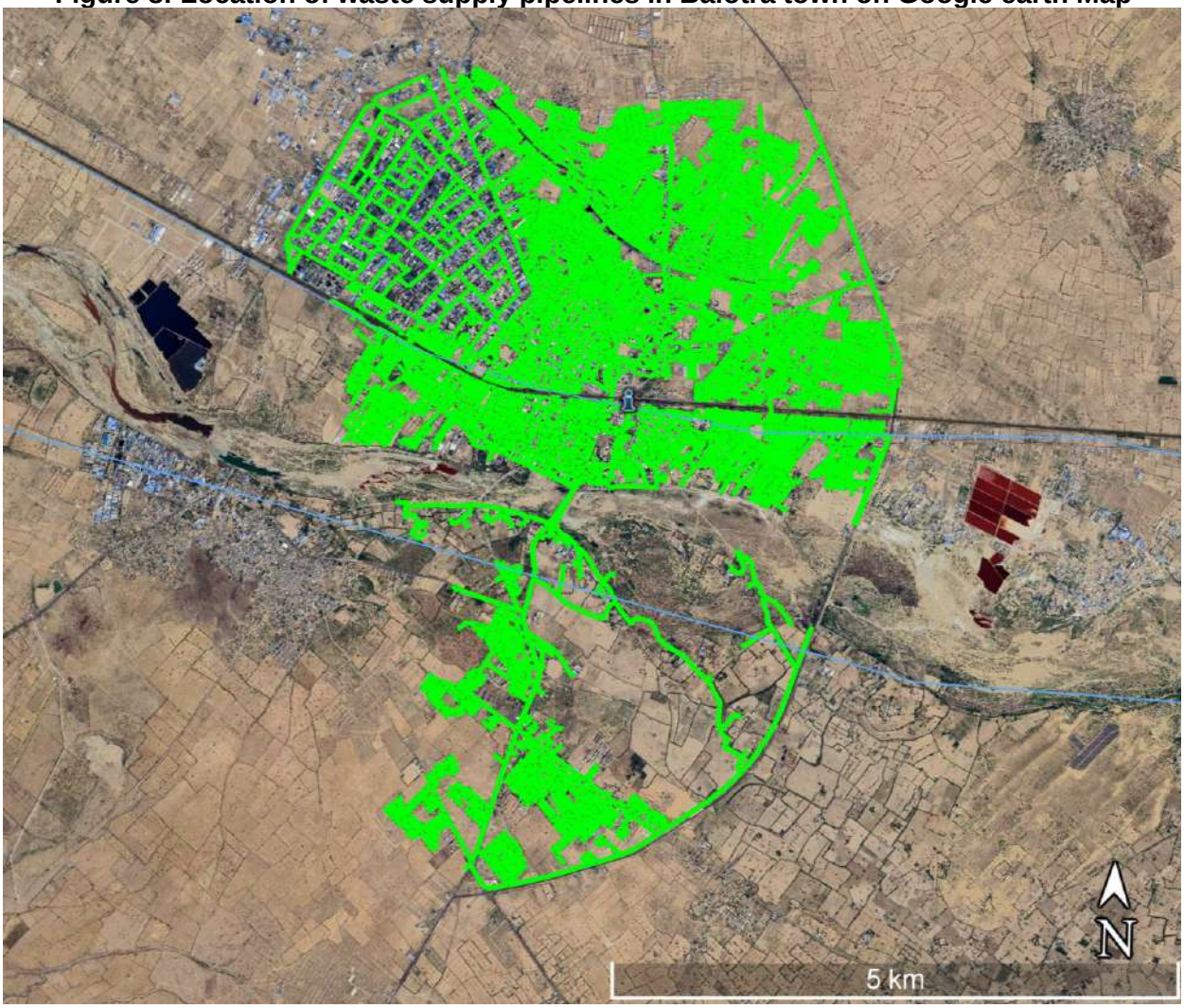


Figure 5: Existing CWR site (600 & 650 KL) at Luni HW, PHED, Balotra on Google Map

Figure 6: Existing CWR site (1100 & 1700 KL) at Samdari Road HW, PHED, Balotra on Google Map

Figure 7: Location of OHSR (700 KL) at Ward No-42 (Proposed by PHED) on Google earth Map

Figure 8: Location of waste supply pipelines in Balotra town on Google earth Map



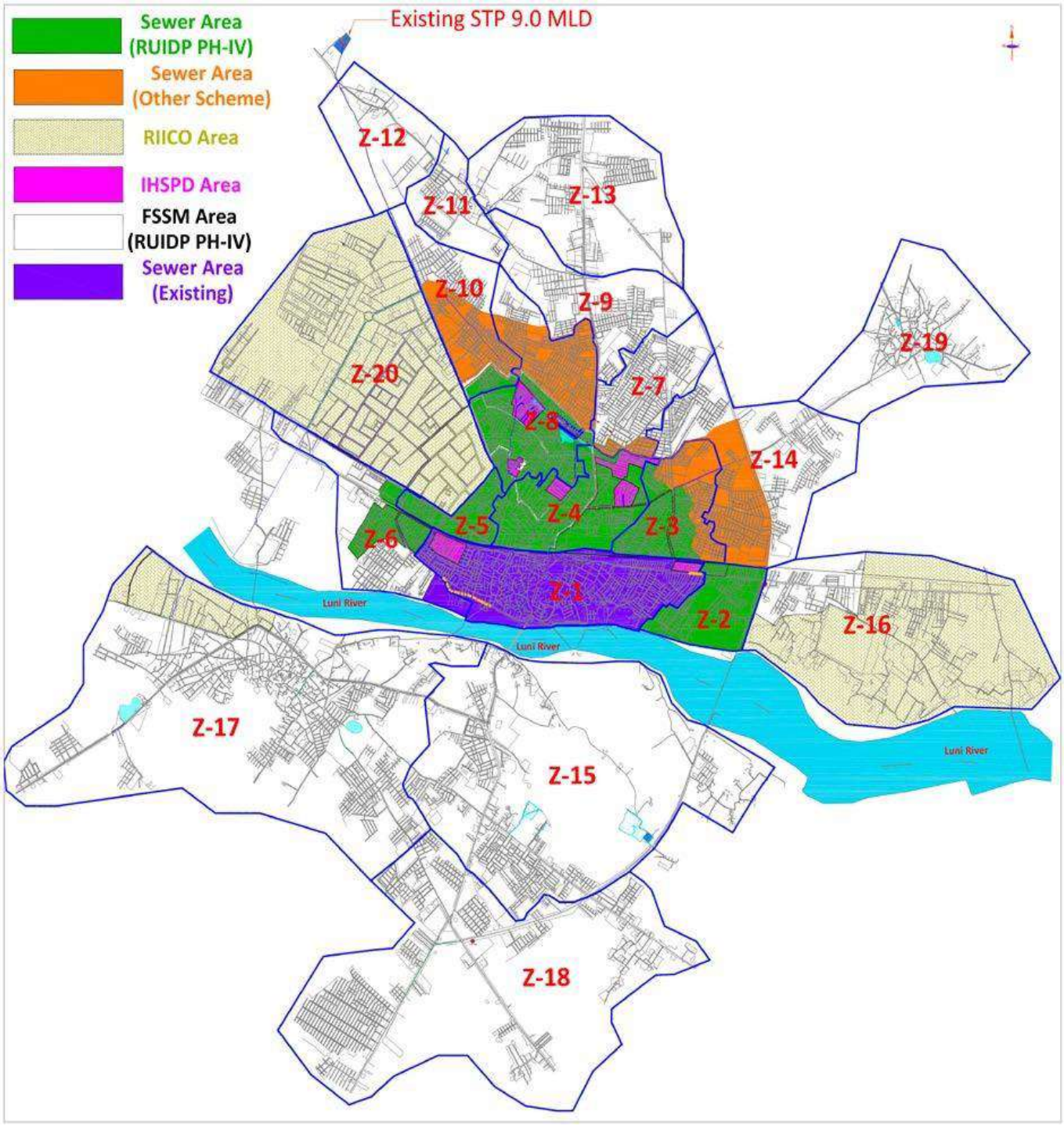


Figure 9: Wards showing under Septage consideration (white colour) and RUIDP PH-IV (Green Colour)

A. Subproject Benefits

44. The subproject is primarily designed to improve environmental quality and living conditions of Balotra Town through provision of water supply. The subproject is primarily designed to improve environmental quality and living conditions of Balotra Town through provision of water supply and sewerage. The benefits arising from this subproject include: (i) increased availability of potable

water at appropriate pressure to all households including urban poor; (ii) reduced time and costs in accessing alternative sources of water. (iii) better public health particularly reduction in waterborne and infectious diseases; (iv) reduced risk of groundwater contamination; (v) reduced risk of contamination of treated water supplies; and, (vi) improvement in quality of water bodies due to disposal of treated effluent meeting disposal standards.

D. Implementation Schedule

45. Subproject is proposed for implementation under DBO modality, wherein which the successful bidder will design the water supply and components (based on the feasibility/preliminary design/standards/guidelines provided in the bid document), construct, commission, and operate for 10 years, after which it will be transferred to PHED Balotra. Therefore, at this stage, subproject is designed only in outline, and the details of components of the subproject provided in report as finalized at this stage based on the preliminary designs and as included in the bid documents. This IEE is based on the subprojects and components detailed in this section, and the IEE will be further updated during the detailed design phase.

After the completion of preliminary designs, bids may were invited and was awarded to successful bidder in month of January 2023. After evaluation of Bids work may be awarded to successful bidder up to July 2023 Project duration of Design Build is 36 months. After completion of construction and commissioning, the scheme will be operated by DBO contractor for 10 years, and after which the O&M will be carried out by PHED.

III. ANALYSIS OF ALTERNATIVES

46. The ADB SPS requires an analysis of project alternatives to determine the best method of achieving project objectives (which is providing potable water to people, and safely collecting and disposing the human waste generated, in Balotra Town , in this case) while minimizing environmental impacts. Alternative analysis provides opportunity to integrate environmental considerations into early stages of project (i.e., pre-feasibility or feasibility study), so that adverse environmental impacts can be avoided or minimized by various alternatives. It also provides opportunity to study various options vis a vis costs, provides a logical base, via transparent process, assist in decision making, gaining public support and ultimately in project approvals and timely implementation.

47. The proposed water supply subproject component in Balotra include treated water conveyance, storage and distribution. Similarly, the sewerage component includes sewage collection network, transmission, treatment and treated wastewater reuse and disposal. Descriptions of various alternatives considered for critical components such as water source, sewage treatment, treated wastewater disposal etc., are presented in the following **Table 13**.

Table 13: Analysis of Alternatives

1.	**Project Need – No Project Alternative**
Type of alternative	'No project' alternative
Description of alternatives	Balotra subproject is proposed to improve the service levels of basic infrastructure – water supply and sewerage. At present, residents of Balotra suffer from inadequate, intermittent and low-pressure supply. Presently, an intermittent water supply system is running in the town with actual service level of ~106 LPCD (once in a day) at consumers' end, which is less than

	standard of 135 LPCD. The supply duration is about 1 to 1.5 hours with low pressure. System is old, inefficient, and leakages are frequent in water pipes, and consequently water losses are high. At present, no sever system is existing in Balotra Town. Living conditions due to lack of proper water supply and sewerage, are poor, unhealthy, unhygienic. Lack of sewerage treatment and disposal system infrastructure in town is also causing environmental pollution, overall poor quality of life. Poor environmental quality affects the urban poor more. The project intends to provide following benefits to the town population, and the "no project" alternative will deprive people of these benefits: (i) increased availability of potable water at appropriate pressure to all households including urban poor; (ii) reduced time and costs in accessing alternative sources of water. (iii) better public health particularly reduction in waterborne and infectious diseases; (iv) reduced risk of groundwater contamination; (v) reduced risk of contamination of treated water supplies; and, (vi) improvement in quality of water bodies due to disposal of treated effluent meeting disposal standards
Selected Alternative	Without subproject would yield the town to be continuously under-serviced that puts the health of the general public at an increasing risk and could potentially worsen the living environment. This 'no project' scenario would impede further social and economic development of the town and the defer commitments to improve the proportion of the population with sustainable access to clean water and basic sanitation. Given the large-scale benefits to the population and environment, 'no project' alternative is considered inappropriate.
2	**Alternative source of water**
Type of alternative	'Water source'
Description of alternatives	**Water Demand** Total projected clear water demand for various design years is given below (including losses in the system) 2025 : 14.33 MLD 2040 : 16.95 MLD 2055 : 19.05 MLD **Present source:** Treated water from Pokran Falsoond Balotra Siwana Water Project (PFBS) is transferred at existing CWRs of Balotra around 14.50 MLD. The quantity of water transferred is 14.50 MLD at the transfer point, but due to the losses occurring enrooted only 9.1 MLD water reaches to the consumers, thus the actual service level of this potable water at consumer end is about 106 LPCD only and actual service level of domestic useable water is only 103 LPCD. Tube wells, constructed near village Bithuja and Kitnod. From these tube wells, approx. 7 MLD of water is being drawn. Presently they are working as backup source in the case of emergency.
Selected Alternative	**Selected source:** Treated water from Pokran Falsoond Balotra Siwana Water Project (PFBS)
3	**Project Locations**
Description of alternatives	**Water distribution and sewer lines**. Sewer and water supply pipes are proposed along the roads/streets in the town within the road right-of-way (ROW). In wider roads water pipes will be laid in the road shoulder beside the tarmac, and in narrow roads, where there is no space, pipes will be laid in the road carriage way by break opening the tarmac. Sewers will be mostly laid in the center of the road, away from water pipes. There are existing asbestos cement pipes underground in the existing water supply networks, the alignment will be fine-tuned during the detailed design, to avoid existing AC pipe alignments as far as possible.

IV. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORKS

A. ADB Safeguard Policy

48. ADB SPS Requires that during the design, construction, and operation of the project necessary compliance to all applicable laws and international conventions / treaties along with pollution prevention and control technologies and practices consistent with international good practice, are ensured.

49. ADB uses a classification system to reflect the significance of a project's potential environmental impacts. A project's category is determined by the category of its most environmentally sensitive component, including direct, indirect, cumulative, and induced impacts in the project's area of influence. Each proposed project is scrutinized as to its type, location, scale, and sensitivity and the magnitude of its potential environmental impacts. Projects are assigned to one of the following four categories:

(i) **Category A.** A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An Environmental Impact Assessment (EIA) is required.

(ii) **Category B.** A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination (IEE) is required.

(iii) **Category C.** A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.

(i) **Category FI.** A proposed project is classified as category FI if it involves investment of ADB funds to or through a FI.

50. The environmental impacts of Balotra water supply and sewerage subproject have been identified and assessed as part of the planning and design process. An environmental assessment using ADB's REA checklist for water supply and sewerage (see **Appendix 1**) was conducted, and results of the assessment show that the subproject is unlikely to cause significant adverse impacts. Thus, this IEE has been prepared in accordance with ADB SPS's requirements for environment category B projects.

51. **Environmental Management Plan.** An EMP which addresses the potential impacts and risks identified by the environmental assessment shall be prepared. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the Project's impact and risks.

52. **Environmental Audit of Existing Facilities.** ADB SPS, 2009 requires an environmental audit, if a subproject involves facilities and/or business activities that already exist or are under construction, including an on-site assessment to identify past or present concerns related to impacts on the environment. The objective of this compliance audit is to determine whether actions were in accordance with ADB's safeguard principles and requirements for borrowers/clients, and to identify and plan appropriate measures to address outstanding compliance issues.

53. **Public Disclosure.** The IEE will be put in an accessible place (e.g., local government offices, libraries, community centers, etc.), and a summary translated into local language for the

project affected people and other stakeholders. The following safeguard documents will be put up in ADB's website so that the affected people, other stakeholders, and the public can provide meaningful inputs into the project design and implementation:

(i) For environmental category A projects, a draft EIA report at least 120 days before Board consideration;
(ii) Final or updated EIA and/or IEE upon receipt; and
(iii) Environmental monitoring reports submitted by the PMU during project implementation upon receipt.

54. **Consultation and Participation.** ADB SPS, 2009 require borrower to conduct meaningful consultation[1] with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation. The consultation process and its results are to be documented and reflected in the environmental assessment report.

55. **Grievance Redress Mechanism.** ADB SPS, 2009 require borrowers to establish a mechanism to receive and facilitate resolution of affected people's concerns, complaints, and grievances about the subproject's performance. The grievance mechanism shall be scaled to the risks and adverse impacts of the subproject.

56. **Monitoring and Reporting.** Borrower shall monitor, measure and document the implementation progress of the EMP. If necessary, the borrower shall identify the necessary corrective actions, and reflect them in a corrective action plan. Borrower shall prepare and submit to ADB semi-annual environmental monitoring reports that describe progress with implementation of the EMP and compliance issues and corrective actions, if any. For subprojects likely to have significant adverse environmental impacts during operation, reporting will continue at the minimum on an annual basis until ADB issues a project completion report.

57. **Unanticipated Environmental Impacts.** Where unanticipated environmental impacts become apparent during subproject implementation, ADB SPS, 2009 requires the borrower to update the environmental assessment and EMP or prepare a new environmental assessment and EMP to assess the potential impacts, evaluate the alternatives, and outline mitigation measures and resources to address those impacts.

58. **Occupational Health and Safety.** ADB SPS, 2009 requires the borrower[2] to ensure that workers[3] are provided with a safe and healthy working environment, taking into account risks inherent to the sector and specific classes of hazards in the subproject work areas, including physical, chemical, biological, and radiological hazards. Borrower shall take steps to prevent accidents, injury, and disease arising from, associated with, or occurring during the course of work, including: (i) identifying and minimizing, so far as reasonably practicable, the causes of potential hazards to workers; (ii) providing preventive and protective measures, including modification, substitution or elimination of hazardous conditions or substances; (iii) providing

1 Per ADB SPS, 2009, meaningful consultation means a process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle 1; (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.

2 In case where responsibility is delegated to subproject contractors during construction phase, borrower shall ensure that the responsibilities on occupational health and safety are included in the contract documents.

3 Including nonemployee workers engaged by the borrower/client through contractors or other intermediaries to work on project sites or perform work directly related to the project's core functions.

appropriate equipment to minimize risks and requiring and enforcing its use; (iv) training workers and providing them with appropriate incentives to use and comply with health and safety procedures and protective equipment; (v) documenting and reporting occupational accidents, diseases, and incidents; and (vi) having emergency prevention, preparedness, and response arrangements in place.

59. **Community Health and Safety.** ADB SPS, 2009 requires the borrower to identify and assess risks to, and potential impacts on, the safety of affected communities during the design, construction, operation, and decommissioning of the subproject, and shall establish preventive measures and plans to address them in a manner commensurate with the identified risks and impacts.

60. **Physical Cultural Resources.** Borrower is responsible for siting and designing the subproject to avoid significant damage to physical cultural resources. ADB SPS, 2009 requires that such resources likely to be affected by the subproject are identified, and qualified and experienced experts assess the subproject's potential impacts on these resources using field-based surveys as an integral part of the environmental assessment process. When the proposed location of a subproject component is in areas where physical cultural resources are expected to be found as determined during the environmental assessment process, chance finds procedures shall be included in the EMP.

61. **ADB SPS International Best Practice Requirements**. ADB SPS, 2009 requires that, during the design, construction, and operation of the project, the executing agency shall apply pollution prevention and control technologies and practices that are consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety (EHS) Guidelines. (IFC's General EHS Guidelines[4] and Sector Specific [Water and Sanitation] Guidelines[5]). These standards contain performance levels and measures that are normally acceptable and applicable to projects. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of India regulations differ from these levels and measures, the PMU and PIUs will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the PMU and PIUs will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS, 2009.

A. National Laws

62. The implementation of the subprojects will be governed by Government of India and State of Rajasthan and other applicable environmental acts, rules, regulations, and standards. These regulations impose restrictions on the activities to minimize or mitigate likely impacts on the environment. It is the responsibility of the project executing and implementing agencies to ensure subprojects are consistent with the legal framework, whether applicable international, national, state or municipal or local. Key standards include those related to drinking water quality, air quality, effluent discharge, and protected areas. Compliance is required in all stages of the subprojects including design, construction, and operation and maintenance.

[4] https://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES

[5] https://www.ifc.org/wps/wcm/connect/e22c050048855ae0875cd76a6515bb18/Final%2B%2BWater%2Band%2BSanitation.pdf?MOD=AJPERES

63. **Environmental assessment.** The Government of India EIA Notification of 2006 (replacing the EIA Notification of 1994) sets out the requirement for environmental assessment in India. This states that environmental clearance is required for specified activities/projects, and this must be obtained before any construction work or land preparation (except land acquisition) may commence. Projects are categorized as A or B depending on the scale of the project and the nature of its impacts.

64. **Category A** projects require environmental clearance from the central Ministry of Environment, Forests and Climate Change (MOEFCC). The proponent is required to provide preliminary details of the project in the prescribed manner with all requisite details, after which an Expert Appraisal Committee (EAC) of the MOEFCC prepares comprehensive terms of reference (TOR) for the EIA study. On completion of the study and review of the report by the EAC, MOEFCC considers the recommendation of the EAC and provides the environmental clearance if appropriate.

65. **Category B** projects require environmental clearance from the State Environment Impact Assessment Authority (SEIAA). The State level EAC categorizes the project as either B1 (requiring EIA study) or B2 (no EIA study) and prepares TOR for B1 projects within 60 days. On completion of the study and review of the report by the EAC, the SEIAA issues the environmental clearance based on the EAC recommendation. The Notification also provides that any project or activity classified as category B will be treated as category A, if it is located in whole or in part within 10 km from the boundary of protected areas, notified areas or inter-state or international boundaries.

66. None of the components of this water supply and sewerage subproject falls under the ambit of the EIA Notification 2006, and, therefore EIA Study or environmental clearance is not required for the subproject.

67. **Applicable environmental regulations.** Besides EIA Notification 2006, there are various other acts, rules, policies and regulations currently in force in India that deal with environmental issues that could apply to infrastructure development. The specific regulatory compliance requirements of the subproject are shown in **Table 14.**

B. Environmental Regulatory Compliance

68. Table 10 presents a summary of environmental regulations and mandatory requirements applicable to Balotra Town water supply and sewerage subproject.

Table 14: Applicable Environmental Regulations

Law	Description	Requirement	Relevance to Project Phase
National Environment Policy (NEP), 2006.	NEP is a comprehensive guiding document in India for all environmental conservation programs and legislations by Central, State and Local Government. The dominant theme of this policy is to promote betterment of	RSTDSP should adhere to NEP principle of “enhancing and conservation of environmental resources and abatement of pollution”.	All phases of project

Law	Description	Requirement	Relevance to Project Phase
	livelihoods without compromising or degrading the environmental resources. The policy also advocates collaboration method of different stakeholders to harness potential resources and strengthen environmental management.		
Rajasthan State Environment Policy, 2010 And Rajasthan Environment Mission and Climate Change Agenda for Rajasthan (2010-14)	Follows the National Environment Policy, 2006 and core objectives and policies are: -Conserve and enhance environmental resources; assure environmental sustainability of key economic sectors; and, improve environmental governance and capacity building - it recommends specific strategies and actions to address the key environmental issues: water resources, desertification and land degradation, forest and biodiversity, air quality, climate change: adoption and mitigation, mining, industry, tourism, energy, urban development, etc. - Establishment of Environment Mission under the chairpersonship of the Chief Minister and a Steering Committee under the chairpersonship of Chief Secretary, Government of Rajasthan Tasks force set up for six key areas	Project implementation should adhere to the policy aims of: conservation and enhancement of environmental resources, integration of environmental concerns into projects/plans, and capacity building in environmental management. Under water sector, major concerns, as the policy notes, are huge water losses and wastage, declining water availability, pollution. Relevant recommendations for the project include control of losses, integrated water resources management, control of raw water pollution[18], reuse and recycling. Avoid/minimize use of forest lands. With reference to climate change adoption and mitigation following should be considered in the project: (i) diminishing flows in surface water bodies, and groundwater depletion, and revival traditional water bodies as water sources (lakes/tanks); (ii) equal stress on demand side management in water; and (iii) minimize energy use - design energy efficiency systems.	All phases of project
EIA Notification,2006	Projects indicated in the schedule of this notification requires EIA study and environmental clearance.	None of the components of this subproject falls under the ambit of the notification; no EIA study or environmental clearance required	Not applicable

Law	Description	Requirement	Relevance to Project Phase
		For New quarries and Sand minings (if required) needs EIA clearence under EIA act.	
Central Ground Water Authority Public Notice 2/100	Public Notice specifies districts and areas where there are restrictions on the construction and installation of any new structure for extraction of groundwater resources without specific approval from the CGWA	Subprojects belonging to the Notified Areas in the Public Notice and will require new structures on extracting groundwater should seek the permission from the Central Groundwater Authority	Not applicable
Public Health Engineering Department Office Order P5 (1) PHE-2010 dated July 14 2020	PHED Office Order states that the State Government is instructed that permits for any new tube wells, bore wells or any structures extracting ground water shall be secured from the District Collector	Subprojects with components shall secure permits from the District Collector for components that include any new tube wells, bore wells or structures extracting groundwater	Not applicable
Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments (1987)	Act was enacted to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water, by Central and State Pollution Control Boards and for conferring on and assigning to CPCB/SPCBs powers and functions relating to water pollution control. Control of water pollution is achieved through administering conditions imposed in consent issued under provision of the Water (Prevention and Control of Pollution) Act of 1974. These conditions regulate the quantity and quantity of effluent, the location of discharge and the frequency of monitoring of effluents. Any component of the subproject having the potential to generate sewage or trade effluent will come under its purview. Such projects have to obtain Consent to establish (CTE) under Section 25 of the Act from Rajasthan State Pollution Control Board (RSPCB) before starting implementation and Consent to Operate (CTO) before commissioning.	No CTE or CTO is required for proposed project compoentns. For Existing STP CTE of is already expired on 30 June 2016 and CTO is already applied and under process by RSPCB. For existing 119 MLD WTP unit at Biliya, Pokran CTE and CTO are to be taken for both WTP plant and DG set under Water and Air Act, therefore consent to establish and consent to operate will be applied taken from RSPCB. All relevant forms, prescribed fees and procedures to obtain the CTE and CTO can be found in the RSPCB website. (http://environment.rajasthan.gov.in)	Construction and Operation

Law	Description	Requirement	Relevance to Project Phase
Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments.	This Act was enacted to achieve prevention, control and abatement of air pollution activities by assigning regulatory powers to Central and State boards for all such functions. The Act also establishes ambient air quality standards. The projects having potential to emit air pollutants into the atmosphere have to obtain CTE and CTO under Section 21 of the Act from RSPCB. The occupier of the project/facility has the responsibility to adopt necessary air pollution control measures for abating air pollution.	The following will require CTE and CTO from RSPCB: (i) Diesel generators (more than 15 KVA); (ii) Batching Plant hot mix plants; and (iii) stone crushers, if installed for construction. All relevant forms, prescribed fees and procedures to obtain the CTE and CTO can be found in the RSPCB website (http://environment.rajasthan.gov.in) If ready mix concrete and hot mix bitumen is procured from third party, contractor has to ensure that the plants, from where material is being purchased is having CTE/CTO and copy should be collected from third party and submitted in PIU For existing 119 MLD WTP unit at Biliya, Pokran has CTO are to be applied and taken for DG set Existing 9 MLD STP has valid CTO under air act for 200 kVA DG set valid upto 28 Feb 2030	Construction and operation
Biodiversity Act of 2002	This Act primarily addresses access to genetic resources and associated knowledge by foreign individuals, institutions or companies, to ensure equitable sharing of benefits arising out of the use of these resources and knowledge to the country and the people.	Not Applicable	Not applicable
Wildlife Protection Act, 1972 and amendment 1991	This overarching Act provides protection to wild animals, birds, plants and matters connected with habitat protection, processes to declare protected areas, regulation of wildlife trade, constitution of state and national board for wildlife, zoo authority, tiger conservation authority, penalty clauses and other important regulations.	None of the components of the subproject are located within the protected Area. Therefore, this act is not applicable.	Not Applicable

Law	Description	Requirement	Relevance to Project Phase
Forest (Conservation) Act, 1980	The Forest (Conservation) Act prohibits the use of forest land for non-forest purposes without the approval of Ministry of Environment Forests & Climate Change (MoEFCC), Government of India	None propoed project components are falls in the forest area therefore forest diversion is not applicable for this subproject.	Not Applicable
Environmental (Protection) Act, 1986 amended in 1991 and the following rules/notifications:	This is an "umbrella" legislation that empowers the Central Government to take all necessary measures to protect and improve the quality of the environment and prevent, control and abate environmental pollution. Empowers central government to enact various rules to regulate environmental pollution, including standards for quality of air, water, noise, soil; discharge standards or allowable concentration limits for environmental pollutants, handling of hazardous substances, locating/prohibiting industries, etc.,	There are rules / notifications that have been brought out under this Act, which are relevant to RSTDSP, and are listed below	Construction and operation
Environmental Standards (ambient and discharge).	Emissions and discharges from the facilities to be created or refurbished or augmented shall comply with the notified standards	**Appendix C-2** provides ambient air quality standards, emission limits and emission stack height requirements for diesel generators **Appendix C-8** provides STP discharge standards	Construction and operation
Noise Pollution (Regulation and Control) Rules, 2000 amended up to 2010.	Rule 3 of the Act specifies ambient air quality standards in respect of noise for different areas/zones.	**Appendix C-7** provides applicable noise standards	Construction and operation
Indian Drinking Water Standards	Gives details of the permissible and desirable limits of various parameters in drinking water as per the Bureau of Indian Standards	**Appendix C-1** provides drinking water standards	Construction and operation
Solid Waste Management Rules 2016	Responsibility of Solid Waste Generator segregate and store the waste generated in three separate streams namely bio-degradable, non-biodegradable and domestic hazardous wastes in suitable bins and handover segregated wastes to authorized waste	Contractor to follow all the rules during construction works	Construction and operation

Law	Description	Requirement	Relevance to Project Phase
	pickers or waste collectors as per the direction or notification by the local authorities from time to time; store separately construction and demolition waste, as and when generated, in his own premises and shall dispose off as per the Construction and Demolition Waste Management Rules, 2016; (iii) No waste generator shall throw, burn or burry the solid waste generated by him, on streets, open public spaces outside his premises or in the drain or water bodies.		
Construction and Demolition Waste Management Rules 2016	(i) Every waste generator shall segregate construction and demolition waste and deposit at collection centre or handover it to the authorized processing facilities (ii) Shall ensure that there is no littering or deposition so as to prevent obstruction to the traffic or the public or drains (iii) Large generators (who generate more than 20 tons or more in one day or 300 tons per project in a month) shall submit waste management plan and get appropriate approvals from the local authority before starting construction or demolition or remodeling work, (iv) Large generators shall have environment management plan to address the likely environmental issues from construction, demolition, storage, transportation process and disposal / reuse of C & D Waste. (v) Large generators shall segregate the waste into four streams such as concrete, soil, steel, wood and plastics, bricks and mortar, (vi) Large generators shall pay relevant charges for collection, transportation, processing and disposal as	Construction waste shall be collected at stockpile area for 8-10 days and will be sent to disposal site. Disposal site shall be identified and allotted by Nagar Parishad after mobilization of contractor (during SIP period) and can't be mentioned at this time. Contractor to follow all the rules during construction works. Sludge or any material if classified as hazardous waste / material is to be handled and disposed according to this Rules	Construction

Law	Description	Requirement	Relevance to Project Phase
	notified by the concerned authorities;		
Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016,	Responsibilities of the occupier for management of hazardous and other wastes.- (1) For the management of hazardous and other wastes, an occupier shall follow the following steps, namely:- (a) prevention; (b) minimization; (c) reuse, (d) recycling; (e) recovery, utilization including co-processing; (f) safe disposal. (2) The occupier shall be responsible for safe and environmentally sound management of hazardous and other wastes. (3) The hazardous and other wastes generated in the establishment of an occupier shall be sent or sold to an authorized actual user or shall be disposed of in an authorized disposal facility. (4) The hazardous and other wastes shall be transported from an occupier's establishment to an authorized actual user or to an authorized disposal facility in accordance with the provisions of these rules. (5) The occupier who intends to get its hazardous and other wastes treated and disposed of by the operator of a treatment, storage and disposal facility shall give to the operator of that facility, such specific information as may be needed for safe storage and disposal. (6) The occupier shall take all the steps while managing hazardous and other wastes to- 6 (a) contain contaminants and prevent accidents and limit their consequences on human beings and the environment; and (b) provide persons working in the site with appropriate training, equipment and the information	Contractor to comply all the requirements of this Act during construction works.	Construction and operation

Law	Description	Requirement	Relevance to Project Phase
	necessary to ensure their safety.		
Wetlands (Conservation and Management) Rules, 2017	The Rules specify activities which are harmful and prohibited in the wetlands such as industrialization, construction, dumping of untreated waste and effluents, and reclamation. The Central Government may permit any of the prohibited activities on the recommendation of Central Wetlands Regulatory Authority.	Not applicable as subprojects components are not located in or near to designated wetland area.	Not applicable
Ancient Monuments and Archaeological Sites and Remains Act, 1958 and Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010.	The Act designates areas within 100 meters (m) of the "protected monument/area" as "prohibited area" and beyond that up to 200 m as "regulated area" respectively. No "construction" is permitted in the "prohibited area" and any construction activity in the "regulated area" requires prior permission of the Archaeological Survey of India (ASI).	There are no ASI protected monuments in Brmer Deistict and therefore project activities will not have impact on any protected monuments .	Not Applicable
The Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961; the Rajasthan Monuments, Archaeological Sites and Antiquities (amendment) Act 2007	Any construction/excavation work in the 'protected area' (as declared by GoR under the Act) requires priori permission of Department of Archeology & Museums -Application under the Rules shall be submitted to Director, State Archeological Department, at least 3 months prior to the work. Department provides conditional permission, including time for completion, procedures to be followed during the work and for chance finds et–.	There are 5 state protected monuments in Barmer District, however the nearest protected monument is located at an aerial distance of 25 km. Thrrefore project activities will not have impact on any protected monuments	Not applicable
The Building and Other Construction Workers (BOCW) Act 1996 and Rajasthan Building and Construction Workers Rules 2009	**Employer shall-** • Provide and maintain, at suitable point, sufficient quantity of wholesome drinking water, such point shall be at least 6 meters away from any washing areas, urinals or toilets • Provide sufficient	Contractors are required to follow all the provisions of BOCW Act and Rajasthan BOCW Rules. Salient features of Rajasthan BOCW Rules are- Chapter III, section 17- Registration of establishments Chapter VIII, section 61- Hours of works, intervals or rest and spread over, overtime	Construction

Law	Description	Requirement	Relevance to Project Phase
	urinals and latrines at convenient place, easily accessible by workers • Provide free of charge, temporary living accommodations near to work sites with separate cooking place, bathing and lavatory facilities and restore the site as preconditions after completing the construction works • Provide crèche with proper accommodation, ventilation, lighting, cleanliness and sanitation if more than fifty female workers are engaged • Provide first aid facilities in all construction sites **For safety of workers employer shall provide-** • Safe access to site and workplace • Safety in demolition works • Safety in use of explosives • Safety in operation of transporting equipment and appoint competent person to drive or operate such vehicles and equipment • Safety in lifting appliance, hoist and lifting gears • Adequate and suitable lighting to every workplace and approach • Prevention of inhalation of dust, smoke, fumes, gases during construction works and provide adequate ventilation in workplace and confined space • Safety in material handling and stacking/un stacking • Safeguarding the machinery with fly-wheel of moving parts • Safe handling and use	Section 62- weekly rest Section 63- night shift Section 67- registers of workers Section 68- Muster roll, wages register Section 70- latrine and urinal facilities Chapter XI- Safety and Health Section 78- fire protection Section 79- emergency action plan Section 80- fencing of motors Section 81- lifting and carrying of weight Section 82- H&S policy Section 83- dangerous and harmful environment Section 84- Overhead protection Section 88- eye protection Section 89- PPEs Section 90- electrical hazards Section 97- use of safety helmets and shoes Chapter XIII-lifting appliances and gears Chapter XV- transport and earth moving equipments Chapter XVI- concrete works Chapter XVII- demolition works Chapter XVIII-Excavation and tunneling Chapter XX- ladders and step ladders Chapter XXII- structural frame and formworks Chapter XXIV- medical facilities and first aid box	

Law	Description	Requirement	Relevance to Project Phase
	of plants operated by compressed air • Fire safety • Limit of weight to be lifted by workers individually • Safety in electric wires, apparatus, tools and equipment • Provide safety net, safety sheet, safety belts while working at height (more than 1.6 mtrs as per OSHA) • Providing scaffolding, ladders and stairs, lifting appliances, chains and accessories where required • Safety in pile works, concrete works, hot asphalt, tar, insulation, demolition works, excavation, underground construction and handling materials • Provide and maintain medical facilities for workers • Any other matters for the safety and health of workers		
Contract Labor (Regulation and Abolition) Act, 1970; The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979	Provides for welfare measures to be provided by the Contractor to contract labor and in case the Contractor fails to provide, the same are required to be provided by the Principal Employer by Law. The principal employer is required to take Certificate of Registration and the Contractor is required to take a License from the designated Officer. The Act is applicable to the establishments or Contractor of principal employer if they employ 20 or more contract labor. The inter-state migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home	• Applicable to all construction works in the project • Principle employer (RUDSICO-EAP) to obtain Certificate of Registration from Department of I, as principle employer • Contractor to obtain license from designated labor officer • Contractor shall register with Labor Department, if Inter-state migrant workmen are engaged • Adequate and appropriate amenities and facilities shall be provided to workers including housing, medical aid, traveling expenses from home and back, etc., **Appendix C-12** provides applicable labor laws including	Construction and operation

Law	Description	Requirement	Relevance to Project Phase
	up to the establishment and back, etc.,	amendments issued from time to time applicable to establishments engaged in construction of civil works.	
The Child Labour (Prohibition and Regulation) Act, 1986	Prohibits employment of children below 14 years of age in certain occupations and processes Employment of child labor is prohibited in building and construction Industry.	No child labour should be employed	Construction and operation
Minimum Wages Act, 1948	Minimum wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of buildings, roads and runways are scheduled employment.	Applicable to all construction works in the project All construction workers should be paid not less than the prescribed minimum wage	Construction and operation
Workmen Compensation Act, 1923	Provides for compensation in case of injury by accident arising out of and during the course of employment.	Compensation for workers in case of injury by accident	Construction and operation
Equal Remuneration Act, 1979	Provides for payment of equal wages for work of equal nature to male and female workers and not for making discrimination against female employees in the matters of transfers, training and promotions etc.	Equal wages for work of equal nature to male and female workers	Construction and operation
Rajasthan Forest Act, 1953 and Rajasthan Forest Rules, 1962	This Act makes the basis for declaration of Reserved Forests, constitution of village forest committees, management of reserved forests and penalties and procedures.	All the proposed components are within municipal boundary of Balotra where no forest areas are present. Intake and rising mains of water supply are away from municipal limits.	Pre-construction and construction
IS 11768: 1986/2005: Recommendations for disposal of asbestos waste material	The standard emphasis that every employer who undertakes work which is liable to generates asbestos containing waste, shall undertake adequate steps to prevent and /or reduce the generation of airborne dust during handling, storing, transportation and final disposal of final disposal of asbestos and asbestos containing products.	The crux is waste avoidance: the practice inculcated should focus the on minimal waste generation. Waste Collection: In the project circumstance, the waste is referred to the damaged powered asbestos which will be collected in the Permissible plastic bags to be disposed to the nearest TSDF facilities.	Construction
IS 12081: Pictorial Warning to be implemented on equipment	The objective of the caution is to make the person handling to take all pre-cautionary measures and make them	The following signs and personal protective equipment shall be used in handling ACM.	Construction

Law	Description	Requirement	Relevance to Project Phase
containing Asbestos Contaminated Products.	aware of all the possible risk.		
IS 11451: Safety and Health Requirements related to Occupational Exposure to Asbestos contaminated Products.	This standard details the occupational exposure allowable and safety at work place to be enforced.	In the project the norms pertaining to limiting number of hours working with ACM will be 8.0 hrs/48 hrs a week and the medical examination has to be periodic, the environmental monitoring has to be done as per the protocol. The safety at work place shall be enforced.	Construction
IS 11768: Waste Disposal Procedure for Asbestos Containing Products.	The protocol pertaining to disposal of the waste is emphasized.	The collection of ACM powered will be in permissible plastic bags, which will be twisted tight at the neck so that the wear and tear due to abrasion will be minimum and the transportation of the asbestos waste has to be done by the authorized vendor to the approved landfill site.	Construction
International conventions and treaties			
Ramsar Convention, 1971	The Ramsar Convention is an intergovernmental treaty that provides the framework for national action and international co-operation for the conservation and wise use of wetlands and their resources. India is one of the signatories to the treaty. The Ramsar convention made it mandatory for the signatory	There are no Ramsar sites in or near Durgapur Town. Not applicable to Durgapur Town water supply and sewerage subproject.	Not applicable

Law	Description	Requirement	Relevance to Project Phase
	countries to include wetland conservation in their national land use plans.		
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973	India is a signatory of this convention which aims to control international commercial trade in endangered species	Not applicable in this project as no endangered species of wild fauna and flora is found in project town.	Not applicable
Montreal Protocol 1992	India is a signatory of this convention which aims to reduction in the consumption and production of ozone-depleting substances (ODS), while recognizing differences in a nation's responsibilities. Ozone depleting substances are divided in two groups Chlorofluorocarbons (CFCs) and Hydrochlorofluoro carbons (HCFCs)	Not applicable in this project as no ODS are involved in construction works	Not applicable
Basel Convention on Trans-boundary Movement of Hazardous Wastes, 1989	India is a signatory of this convention which aims to reduce trans-boundary movement and creation of hazardous wastes	Contractor to follow the provisions of Hazardous Waste Rules 2016 for storage, handling, transport and disposal of hazardous waste emerged during construction works Under this Convention, asbestos or asbestos waste in the form of dust and fibers is classified as hazardous waste.	Not applicable
Convention on Migratory Species of Wild Animals (CMS), 1979 (Bonn convention)	CMS, also known as Bonn convention, was adopted in 1979 and entered into force on 1 November 1983, which recognizes that states must be the protectors of migratory species that live within or pass through their national jurisdictions, and aims to conserve terrestrial, marine and avian migratory species throughout their ranges. Migratory species threatened with extinction are listed on Appendix I of the Convention. CMS Parties strive towards strictly protecting these species, conserving or	Not applicable to this project as no migratory species of wild animals are reported in the project areas.	Not applicable

Law	Description	Requirement	Relevance to Project Phase
	restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them. Migratory species that need or would significantly benefit from international cooperation are listed in Appendix II, and CMS encourages the Range States to conclude global or regional agreements.		

69. **Clearances / permissions to be obtained prior to start of construction**. **Table 15** shows the list of clearances/permissions required for project construction. This list is indicative and the contractor should ascertain the requirements prior to start of the construction, and obtain all necessary clearances/permission prior to start of construction.

Table 15: Clearances and permissions required for Construction activities

S. No	Construction Activity	Statute under which Clearance is Required	Implementation
1	Land for project activity	Allotment and approval for specific land use	ULB
2	Pipe laying works	Permission from Balatra ULB and PWD (where applicable)	PIU
3	Establishment of construction camps	Allotment and approval for specific land use	Contractor
5	Tree Cutting	State forest department/Revenue (Tehsildar)	PIU
6	Hot mix plants, Crushers, Batching plants and DG Set	Consent to establish and consent to operate under Air Act, 1981 from RSPCB	Contractor
7	Storage, handling and transport of hazardous materials	Hazardous Wastes (Management and Handling) Rules. 2016 Manufacturing, Storage and Import of Hazardous Chemicals Rules, 1989 from RSPCB	Contractor
8	Sand mining, quarries and borrow areas	Permission from District Collector/ State Department of Mines & Geology	Contractor
9	New quarries and borrow areas	Environmental clearance under EIA Notification 2006	Contractor
10	Use of vehicles and equipment	Pollution under control certificate (PUC) form RTO	Contractor
11	Temporary traffic diversion measures	Temporary traffic diversion measure including use of alternate road from District traffic police	Contractor
12	Use of Railways ROW for construction area/ crossing	Indian Railways	PIU
13	Use of highway ROW for construction area/ crossing	National Highway Authority of India	PIU

70. PMU will be overall responsible for supervision in getting all clearances and provide details to ADB through semi-annual report. PMU will ensure all necessary regulatory clearances and approvals are obtained prior to commencement of works. Respective PIUs, with support of project

consultants and DBO contractors, are responsible for obtaining the clearances/permits and ensuring conditions/specifications/provisions are incorporated in the subproject design, costs, and implementation. The PIUs shall report to PMU the status of compliance to clearances/permits as part of the regular progress reporting.

V. DESCRIPTION OF ENVIRONMENT

A. Physical Resources

Location, Area & Connectivity

Location, Area and Connectivity*:* Balotra is located in Barmer District of Rajasthan, India. This city is located about 105 km from Jodhpur City and it is also famous for Hand Block Printing & Textile Industries. Balotra tehsil has total population is approx. 75,000. The city is also famous for Nakoda Jain temple. Balotra is located at 25.83°N 72.23 E. It has an average elevation of 106 metres (347 feet). covering geographical area of 28,387 sq km. It is the second largest district in the State covering about 8.29% of its total area

B. Topography, Soils and Geology

71. **Topography.**. The topography of Balotra is characterized by flat to undulating terrain with occasional sand dunes. The district Barmer as a whole forms part of the Great Indian Thar Desert. The district is divided into four sub-divisions. There are eight blocks in the district namely Baetu, Balotra, Barmer, Chohtan, Dhorimanna, Siwana, Sheo, Sindhari. The district has 2 Municipalities, and 2460 Revenue Villages. It is surrounded by Jaisalmer in the north, Jalore in the south, Pali and Jodhpur in the east and Pakistan in the west.

72. **Soil**. Soils of the district are classified into five catogaories which are –

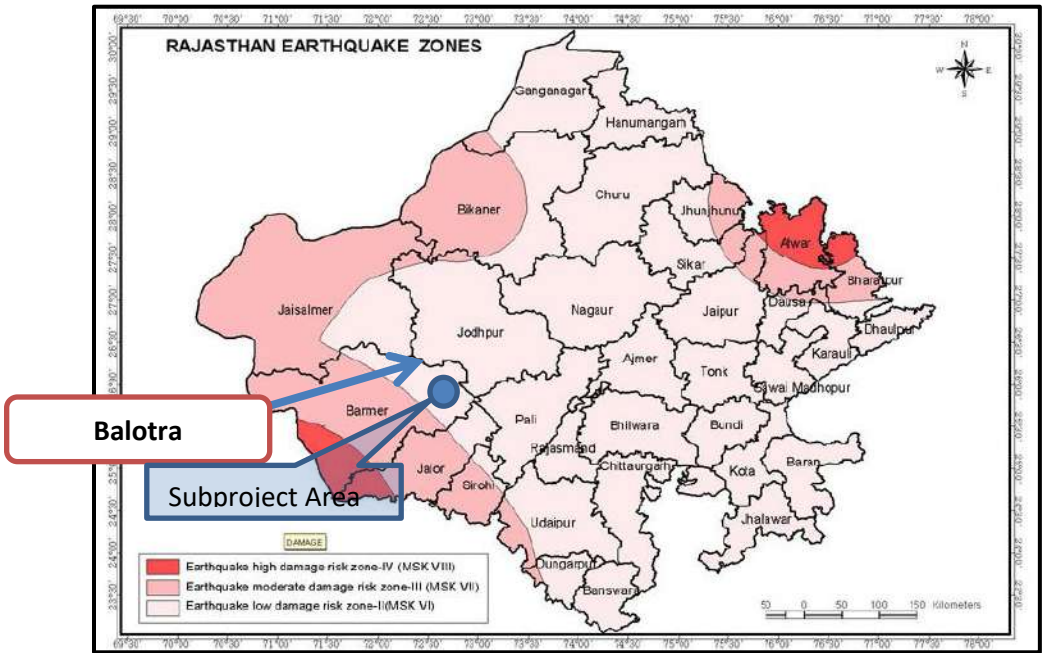
I. Desert soil: Desert soil area is occupied by alluvium and wind blown sand, yellowish brown, sandy to sandy loam, loose, structure less, well drained with high permeability and lies in northern, western and central parts of the district.
II. Sand dunes: These are non-calcareous soil, sandy to loamy sand, loose, structure less and well drained. Sand dunes lie in northern, western and central parts of the district.
III. Red desertic soil: These are pale brown to reddish brown soils, structure less, loose, and well drained. Texture varies from sandy loam to sandy clay loam. These soils occupy eastern and southeastern parts of the district.
IV. Saline soil of depressions: This type of soil is found in salt lakes. They are dark grey to pale brown, heavy soils with water table very near to the surface and are distinctly saline.
V. Lithosols & Regosols of hills: This type of soil is found in isolated hills as lithoslopes.

The soil in the Balotra town is predominantly sandy, with some areas having a loamy texture.

73. **Geology.** The geology of Balotra is dominated by sedimentary rocks, which were formed during the Mesozoic era. The sedimentary rocks in Balotra consist primarily of sandstone and shale, which were deposited during the Jurassic and Cretaceous periods. These rocks were formed as a result of the deposition of sediments in a shallow sea that covered much of western India during this time period. The sandstone formations are particularly well-developed in Balotra and are known for their distinctive red color.

74. **Seismology.** According to the Vulnerability Atlas of India, most of Barmer District, including Balotra Town , is in an area of low earthquake risk (Zone II). Although Rajasthan has not experienced a major earthquake in the recent past, there have been 37 events with a magnitude of 5-7 since 1720, with the most recent occurring in 2001. This measured 6.9 on the Richter Scale, but because the epicentre was in neighbouring Gujarat, there was only limited damage in Barmer.

Figure 10: Earthquake Zone Map of Rajasthan



Climatic Conditions & Rainfall

75. The climate of Balotra is largely arid, that turns extremely hot during the summer and extremely cold during the winters. The winter season is from December to February and is followed by summer from March to June. The mean daily max temperature varies from 28°C during January to 48°C during June while the mean daily minimum temperature varies from 0°C to 26°C. Average annual rainfall of the area is 252 mm.

Surface Water

76. The Luni River is a significant river in western Rajasthan, India. It originates in the Pushkar valley of the Aravalli Range, flowing southwest through the districts of Ajmer, Nagaur, Pali, Jodhpur, and Barmer. The river then enters the marshy lands before finally emptying into the Rann of Kutch in Gujarat.

77. Balotra town is located on the banks of the Luni River in the Barmer district. The water quality of the Luni River in Balotra town has been a matter of concern for many years. The water quality of the Luni River at Balotra town is highly polluted.

78. The Surface water quality of raw water and treated water from WTP is presented in table below, shows the WTP is working well and all tested parameters are well within the acceptable range of drinking water standards (IS 10500-2012) and WHO guidelines for drinking water.

Table 17: Drinking water quality report

Group	National Standards for Drinking Water[a]			WHO Guidelines for Drinking-Water Quality, 4th Edition, 2011[b]	Surface water source			
	Parameter	Unit	Max. Concentration Limits[d]		Raw water	WTP filter bed	CWR Biliya	CWR Pokran
Physical	Turbidity	NTU	1 (5)	-	48.0	1.0	0.8	0.8
	pH		6.5 – 8.5	none	7.9	7.5	7.4	7.4
	Color	Hazen units	5 (15)	none				
	Taste and Odor		Agreeable	-				
	TDS	mg/l	500 (2,000)	-				
	Iron	mg/l	0.3	-				
	Manganese	mg/l	0.1 (0.3)	-				
	Arsenic	mg/l	0.01 (0.05)	0.01				
	Cadmium	mg/l	0.003	0.003				
	Chromium	mg/l	0.05	0.05				
	Cyanide	mg/l	0.05	none				
	Fluoride	mg/l	1 (1.5)	1.5	0.28	0.29	0.3	0.32
	Lead	mg/l	0.01	0.01				
	Ammonia	mg/l	0.5	none established				
Chemical	Chloride	mg/l	250 (1,000)	none established	30	40	30	50
	Sulphate	mg/l	200 (400)	none				
	Nitrate	mg/l	45	50	5	6	5	6
	Copper	mg/l	0.05 (1.5)	2				
	Total Hardness	mg/l	200 (600)	-	110	110	110	110
	Calcium	mg/l	75 (200)	-				
	Zinc	mg/l	5 (15)	none established				
	Mercury	mg/l	0.001	0.006				
	Aluminum	mg/l	0.1 (0.3)	none established				
	Residual Chlorine	mg/l	0.2	5				
Micro Germs	E-coli	MPN/100ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample				
	Total Coliform	MPN/100ml						

Sample collection date 18-09-2022

Source PHED Lab, Jaiselmer

Groundwater

79. Inspite of scanty rainfall in the district, still the Barmer block does not seem to have resorted to over exploitation as it falls under 'safe' category from ground water development perspective. The only block that falls under 'Notified' category is the Baytoo block. Overall the ground water in the northern part of the district is under more stressed as compared to other parts. Balotra town falls under Over Exploited category. Categorization of ground water zones is given below:-

Categorization on the basis of stage of development of ground water	Block Name
Safe	Barmer
Critical	Sindhari, Chohtan
Over Exploited	Sheo, Dhorimanna, Siwana, Balotra
Notified	Baytoo
Basis for categorization: Groundwater development <= 70% - Safe; <=100% - Critical and >100% - Over-Exploited. In Notified blocks development of GW is not permitted any more	
Source: Ground Water Dept. Report of Barmer District 2013.	

Groundwater Quality

80. Ground water quality of Balotra town is not good with regard to TDS, Total Hardness, Chloride and Fluoride as their concentation are generally found more than the permissiable limit. Ground water quality is given in Table 16. DBO contractor is required to conduct ground water quality of Balotra in the pre-construction phase and will be updated in IEE report.

81. . The groundwater quality of tube wells in Balotra is presented in Table below. Groundwater is alkaline in nature with pH ranging from 7.1 to 7.9, and within the acceptable range of drinking water quality. Most of the tested parameters are not within the desirable limits of drinking water standards (IS 10500-2012) and WHO guidelines for drinking water. inducing the Fluoride content.

82. TDS, Total Dissolved Solids, Cloride and total hardness exceeding the limits Indian standards and WHO guidelines in all 5 samples, Fluoride in T/W2 and T/W-4 tube well, Nitrate two samples (T/W-2 and T/W-4).. Therefore, untreated ground water does not qualify the criterion for drinking purposes in Balotra Town. Therefore, only the surface water source (IGMC) is proposed under the proposed subproject

Table. 17. Ground water quality report of Balotra Town (Date of Sample Collection 19 July 2022)

Group	National Standards for Drinking Water[a]			WHO Guidelines for Drinking-Water Quality, 4th Edition, 2011[b]	Water Quality of Tube wells				
	Parameter	Unit	Max. Concentration Limits[d]		T/W-1	T/W-2	T/W-3	T/W-4	T/W-5
Physical	Turbidity	NTU	1 (5)	-	0.5	0.6	0.5	0.7	0.9
	pH		6.5 – 8.5	none	7.9	7.1	7.1	7.1	7.3
	Color	Hazen units	5 (15)	none					
	Taste and Odor		Agreeable	-					
	TDS	mg/l	500 (2,000)	-	**5100**	**3800**	**5100**	**1800**	**3000**
	Iron	mg/l	0.3	-					
	Manganese	mg/l	0.1 (0.3)	-					
	Arsenic	mg/l	0.01 (0.05)	0.01					
	Cadmium	mg/l	0.003	0.003					
	Chromium	mg/l	0.05	0.05					
	Cyanide	mg/l	0.05	none					
	Fluoride	mg/l	1 (1.5)	1.5	0.3	**1.5**	0.6	**2.8**	0.6
	Lead	mg/l	0.01	0.01					
	Ammonia	mg/l	0.5	none established					
Chemical	Chloride	mg/l	250 (1,000)	none established	**3300**	**2780**	**3580**	**3640**	**1500**
	Sulphate	mg/l	200 (400)	none					
	Nitrate	mg/l	45	50	31	**57**	14	**78**	27
	Copper	mg/l	0.05 (1.5)	2					
	Total Hardness	mg/l	200 (600)	-	**1300**	**850**	**1850**	**800**	**1200**
	Calcium	mg/l	75 (200)	-					
	Zinc	mg/l	5 (15)	none established					
	Mercury	mg/l	0.001	0.006					
	Aluminum	mg/l	0.1 (0.3)	none established					
	Residual Chlorine	mg/l	0.2	5					
Micro Germs	E-coli	MPN/100ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample					
	Total Coliform	MPN/100ml							

[a] Bureau of India Standard 10500: 2012.
[b] Health-based guideline values.
[d] Figures in parenthesis are maximum limits allowed in the absence of alternate source.

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Air Quality

83. There are no data on ambient air quality of Balotra town, which is not subject monitoring by the Rajasthan State Pollution Control Board (RSPCB). Air quality monitoring shall be conducted to establish baseline in the pre-construction phase (SIP period) by the contractor and will be updated in IEE report.

Noise Quality

84. Noise level quality of Balotra is not available and DBO contractor is required to conduct noise level monitoring of Balotra; at project sites, in the pre-construction phase and will update in IEE report.

C. Ecological Resources

85. **Protected areas.** The nearest protected area is Desert National Park located 143 km from project town in west direction. Jasol and Bithuja Chanelization Protected Forest at 4 km & 5 km from proposed pipe laying network.

86. **Fauna.** Common flora species of Balotra town are given below: -

Mammals: The Jungle cat *(Felis chaus),*The Indian Porcupine *(Hystrix leucura),* Rojra/Blue Bull *(Boselaphus tragocamelus),*Black buck/Indian antelope *(Antilope cervicapra),* The Chinkara (Indian gazelle *(Gazella bennetti),* The common Hare *(Lepus dayanus),* Striped squirrels *(Funambulus spp),* The common mangoose *(Herpestes edwardsii),* Hedge hog *(Hemiechinus collaris)and* Bats *(Pipistrellus pipistrellus) etc.*

Birds: Near the proposed project sites various avifauna are found Viz. Koyal *(Eudynamys scolopaceu),* Parrot *(Psittacula krameri),,*Jungle Crow *(Corvus Inacrorhynchos),* Bulbul *(Pycnonotus barbatus),* House sparrow *(Passer domesticus),* Owl *(bubo),* Kite *(Milvus milvus),* Pigeon *(Columba livia),* Pea fowl *(Pavo cristatus),* Great Indian Bustard (*Ardeotis nigriceps)*

87. **Flora.** Major tree species in project area include Babul, Sagwan, Khakhra, *Terminalia belarica* (Behara), *Azadirachta indica* (Neem), Khejri- *Prosopis cineraria*, Lasura or Lehswa-*Cordia dichotoma*, Kair or Teak -*Capparis deciduas*, Pakori-*Ficusrumphii*, etc. There are no vulnerable, threatened and/or endangered species of flora and fauna reported in the project areas. Common shrub species found in the area are *Adhatodavasica, Calotropis procera, Ipomea carnea, Prosopis juliflora, Achyranthes aspera, Ageratum conyzoides*, Argemone etc.. On the review of available information, no rare or endangered species of flora and fauna prescribed by IUCN or WPC, 1972 are found along the project areas.

Figure 11. Showing distance of forest blocks from Existing 9 MLD STP

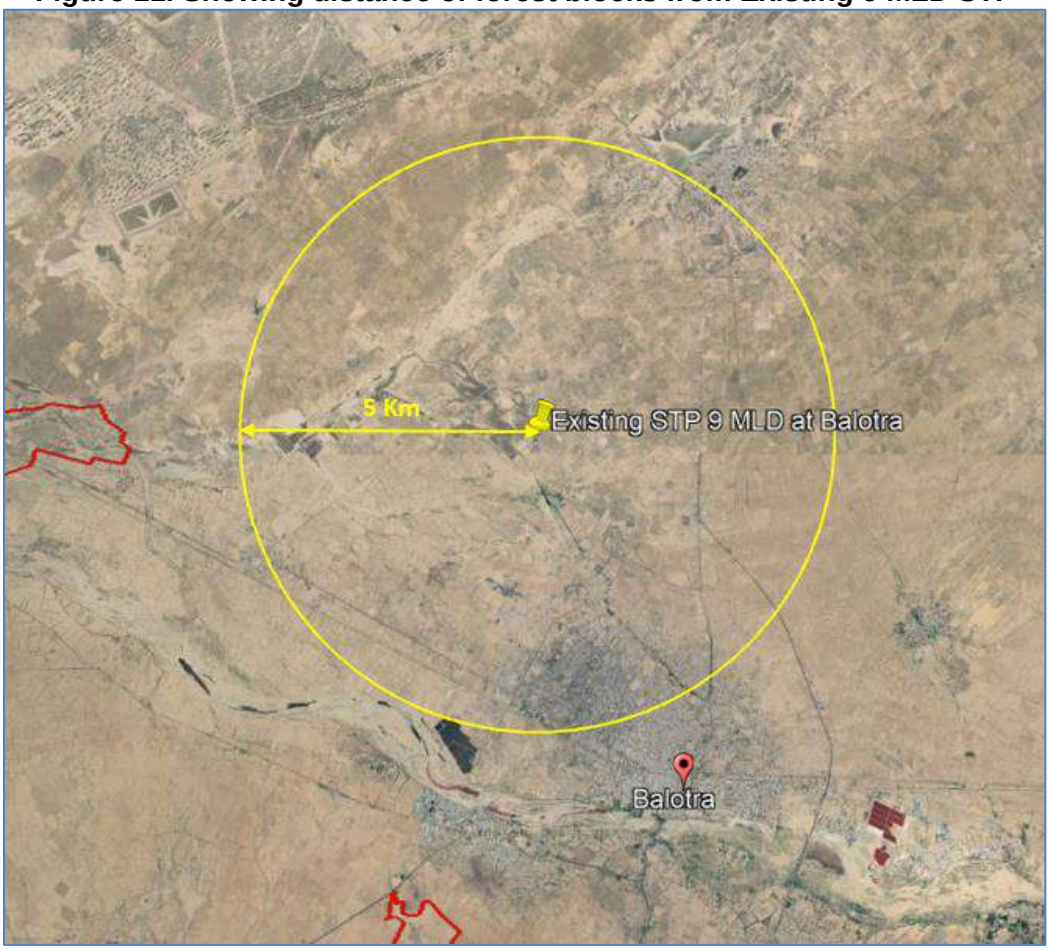


Figure 12. Showing distance of nearest Protected site, Desert Natinal Park from Balotra town

88. Biodiversity Assessment has been carried out through online IBAT analysis tool for potential presence of critical habitat within the proposed projects potential area of influence. In addition, to the potential impacts on identified local biodiversity and ecosystems, ADB's SPS, 2009 requires demonstration that the project will not adversely affect the identified critical habitat. ADB SPS, 2009 states that projects should not be developed within critical habitat areas unless all of the below criterion are met (i) there are no measurable adverse impacts, or likelihood of such, on the critical habitat which could impair its high biodiversity value or the ability to function; (ii) the project is not anticipated to lead to a reduction in the population of any recognized endangered or critically endangered species or a loss in area of the habitat concerned such that the persistence of a viable and representative host ecosystem be compromised; and (iii) any lesser impacts are mitigated.

89. Biodiversity Assessment Report (IBAT Analysis) for Water Supply (CWR) and Sewerage system (STP located on in Balotra Town has been attached with this report as Appendix 5. The screening study for critical habitation indicates that within the area of analysis (AOA) there are no known species which would qualify the area as critical habitat under the set criteria (criterion 1–5, as presented in the report). As per IBAT report; within 50 km radius of STP. There are 16 species of concern fauna listed as IUCN Red list, which are wild species and not reported in urban areas of Balotra. The nearest Protected area Desert National Park is located at an aerial distance of 143 km from project town. Proposed activities will not have impact on these species. There is no national or international protected area within the 50 km radious of project. There is no key bio-diversity areas within the buffer of 1km, 10 km,and 50 km.

D. Economic Development

Land use

90. The existing land use pattern in Balotra Municipality area for Balotra Urbanized Area map for the year 2031 has been taken as a base for finalization of this land-use pattern. It shows the total Balotra Municipality area is subjected to mixed land uses like Residential, Commercial, Industrial, Government, Recreational, Public and Semi-public, Agricultural, Circulation (Transportation) etc. Details of the land use is provided in **Table 18** below.

Table 18: Existing Land Use of Balotra

S. No.	Use	Present Land Use - 2011		Proposed Land Use - 2031		% age of urbanisablearea
		Area in Hectares	% age of developed area	Area in Hectares	% age of Developed area	
1	Residential	665	51.51	3164.00	63.39	63.00
2	Commercial	43	3.30	125.00	2.50	2.50
3	Industrial	207	16.03	749.00	15.01	14.90
4	Governmental	10	0.77	60.00	1.20	1.20
5	Public & Semi Public	165	12.78	348.00	6.97	6.90
6	Recreational	9	0.70	172.00	3.45	3.40
7	Circulation	192	14.90	373.00	7.47	7.40
	Developed Area	**1291**	**100%**	**4991**	**100%**	**99.30**
8	Govt. Reserved (Vacant)	318				0.00

S. No.	Use	Present Land Use - 2011		Proposed Land Use - 2031		% age of urbanisablearea
		Area in Hectares	% age of developed area	Area in Hectares	% age of Developed area	
9	Agriculture, Nurseries, Forests & Hills	3				0.00
10	Water Bodies	321		33		0.70
11	Mining					
	Urbanised Area	**1933**		**5024**		**100%**

*Source: Master Plan Balotra 2011-2031

91. In the Balotra Town approx. 99.30 % area is developed area, land 2.1 % is water bodies 0.70 % is govt.

Commerce, Industry & Agriculture

92. **Industries:** In the barmer district 1979 are MSME, Micro & Small Em Part-II UAM Units; 12532 are Micro, Small Units Emp; 07 are Large, Medium scale unit; 1998 are Large, Medium scale unit Employment. The name of Riico Industrial Area: - (a).Barmer city-I, II, II ext. (b).Balotra city-I, II, III, IV (c). Samdari (d). Mokalsar and (e). Sheo.

93. Most important industry in Balotra is textile printing and imprinting, which is why the town developed steadily in last century and still growing in south bank of Luni river. As per the India census, 44% of all working peoples are deployed in industries, followed by trade (23.50%) and other services (19%). 4% each are deployed in agriculture and construction activites, while 5.5% are deployed in transport and communication. This employment matrix indicats the industry (Textile printing and imprinting) are the major employment genrators in Balotra.

94. There are about 400 industrial units in Balotra alone while there are 214 and 111 industrial units in the adjacent Bithuja and Jasole villages (which are developed along with Balotra industrial areas) respectively, making it a total of 725 industrial units in the area

95. There is an industrial area developed in Nort-West of town in three phases spreading over 160 hactere. Apart from this designated industrial area, some industries are located in Nakoda Road. A total of 716 industrial units are functional in Balotra and there are some 1040[6] cottage insdustries in town and mnjority of them are related to testile printing.

96. **Agriculture**: The main occupation of the people of the district is agriculture. With the increase in irrigation facilities, use of good fertilizer and seed etc. not only the under cultivations would increase but there is likelihood of sowing double crops in Balotra, Siwana, Sindhari and Dhorimana panchayat samities. This would lead to increased use of improved agricultural implements, presently these are supplied form neighboring districts. Thus there are possibilities of setting of agricultural implements industrial unit in these areas.

Other Infrastructure

[6] Balotra Master Plan 2011-2031.

97. **Storm Water Drainage.** Presently the road in Balotra town is equipped with open drains, but most of the drains are silted resulting in overflow and resulting flooding in monsoon. As reported by Balotra Municipal Board, the total length of drains is approximately 4.0 Km. An efficient network of storm water drains and outfall system is required to drain out storm water runoff.. The general slope of the city is from northeast to southwest, which is also the direction of drainage. Nearly, all ephemeral streams flow in this direction.

98. **Power Supply.** The power supply in the Balotra comes from Debari Grid Station near Udaipur. The supply is via Jalore. The 132 kVA Grid Station is located at Balotra. Barmer is connected by 33 kV line. The length of 33 kV lines in the district was 773.42 km. that or 11 kV was 4331.36 km. and that of distribution lines was 1865.51 Km. Almost all towns and mandies are covered by the net work of power lines.

99. Transport**.** Balotra has both private and RSTRC Bus services for various cities of India like Jodhpur, Pali,Jaipur, Udaipur, Ahmadabad, Pune, Mumbai, Surat, Vadodara etc. This town is connected with Jodhpur, Barmer, Jaipur, Ahmedabad, Pune, Surat, etc. The nearest airport from Balotra is Jodhpur airport, 100 km away from Balotra.

E. Socio Cultural Resources

100. As of 2011 census of India, Balotra had a population of 74496 souls. Males constitute 38715 of the population and females constitute 35781. Balotra has an average literacy rate of 75.52% which is higher than the state average of 66.11%. Male literacy is 86.03%, and female literacy is 64.18%. In Balotra, 15% of the population is under 6 years of age group. Sex Ratio in the town is also higher than the state ratio which is 924 against the state average of 928. The Sex Ratio of child is 912 compared to the state average of 888. The Major regional languages spoken are Hindi, English and Marwari.

History, Culture and Tourism.

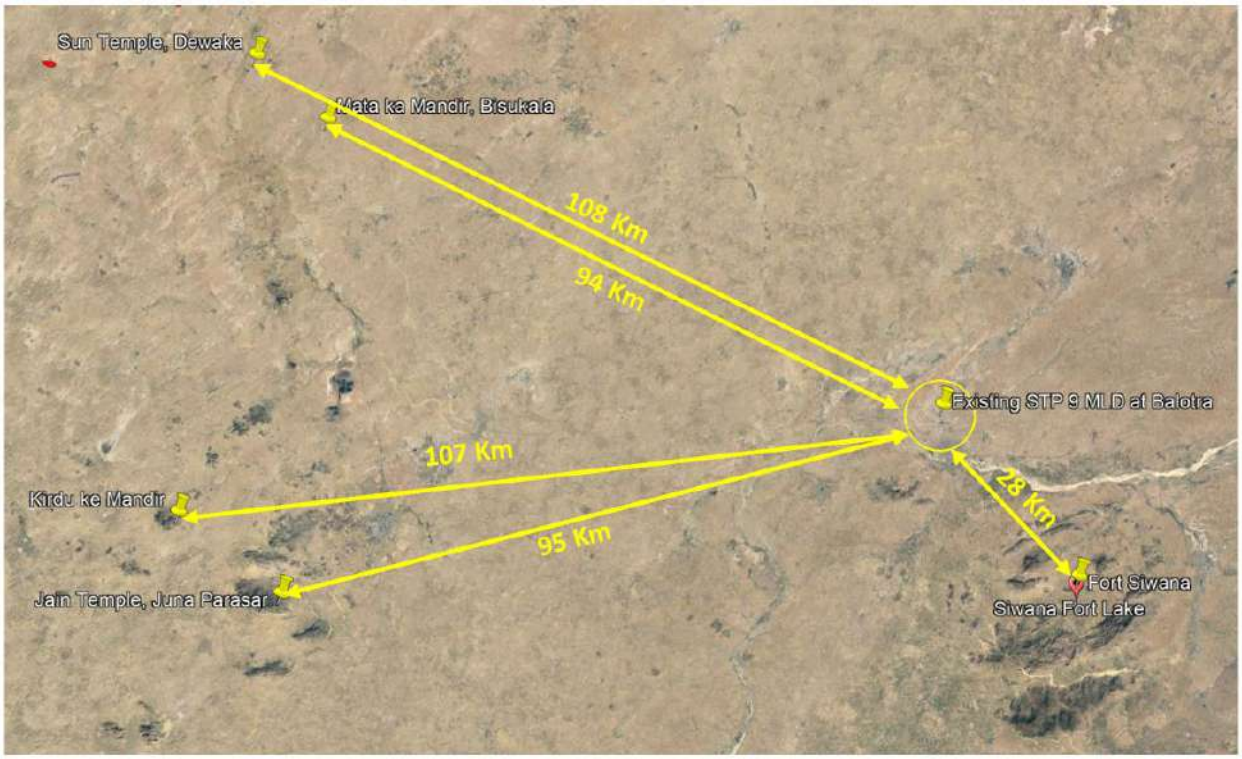
101. Balotra is an important town of Badmer District. Balotra is situated at about 105 km distance from district head quarter having an average elevation of 106 m asl. Balotra has a railway station and nearest airport is Jodhpur. Balotra is a sub district head quarter and its population as per 2011 ensus is 74,496.

102. Balotra is well connected with Jodhpur, Jalor, Sirohi, Ajmer and Jaipur with roads. River Luni flows in southwest direction of city and Ranchorai Vaishnava temple is situated in its north at 12 km distance. Nakoda Jain temples are situated in south direction at a distance of 15 km.

103. Balotra twon was established in 16th Century in the north bank of Luni River[7] and it rapidly developed in twentieth century after the town was connect by train in 1891. There are no historical monuments in Balotra , however, there are 9 temples in and around Balotra, notable ones are Nakoda Jain Temples, Ranchor Temple, Brahama Temple, Ramdev Temple, Ramsapeer and Akadia temple. Tourism in the town is mainly religious tourism, especially Jains visit the town for religious purpose.

[7] Balotra Master Plan 2011-2031.

Figure.13. distance of nearest State Protected Monuments from Balotra town



F. Environmental Settings of Investment Program Component Sites

104. Sewers and water supply pipes will be laid along the roads/streets in the town within the road right of way (ROW). In wider roads pipes/sewers will be laid in the road shoulder beside the tarmac, and in narrow roads, where there is no space, sewers will be laid in the road carriage way by break opening the tarmac. Roads in some part of the town are narrow. Roads are lined both sides with open drains. In narrow roads sewers will be laid in the middle of the road, which may affect the traffic. Bigger diameter trunk sewers will be laid along the main roads, which are wide and have adequate space. No tree cutting is anticipated as there is adequate space to lay the water & sewer pipeline in those roads. Pipe networks for water supply will be laid in the entire town within the existing RoW. There is sufficient space available for laying of pipe line. These works will require advance permission from concerned authority for road cutting and traffic diversion etc. If any tree cutting will be required during execution mitigation measures shall be adopted.

105. There are no ASI protected monuments in Balotra town and in project area. There are five state protected monuments in Barmer District, however, no protected monument is located in project area. Considering the historical background of the town, there may be possibilities of any chance finds encountered during excavation for pipe laying.

106. Site environmental features of all subproject sites and photographs are presented in the following Table15. Site Photographs are presented in Appendix 6.

Table 19: Environmental Features of Project sites

S. No	Subproject component	Environmental Features of the Site	Photographs
1	Replacement of 442.09 km distribution network and Replacement of existing transmission line of 8.380 km total	Transmission line and distribution lines will be mostly laid along the main roads and wider roads in the town. Pipes will be laid underground along the Khed Road, Mukesh Rathore Marg, The Lalit Cafe Road, Khed Road, Jhanwar-Balotra Road, Jerela Marg, Moongra Road, NH-68, etc roads/streets in the towns within the existing road's right of way (ROW). In wider roads pipes will be laid in the road shoulder, and in narrow roads, where there is no space, pipes will be laid in the road carriage way. Water pipes will be laid mostly in the edge of the road. Roads in the old part of the town are quite narrow (~3m), and in the rest of the town roads are wider. Roads are lined with open drains. There are no trees along the roads, except in some new colonies in the outer areas. Common property resources such as community-owned facilities, hospitals, schools, religious places, public utilities and Commercial establishments are abutting most of the main roads in the town.	**Photographs of high density areas**.   Shastri Circle the areas where rising main will be traverses  At Chatri ka mochja  near Near Luni Near Zwero Gate

S. No	Subproject component	Environmental Features of the Site	Photographs
2	installtion for 4 nos of pumps (1.09 MLD and 9.19 MLD) at Samdani Head Works	Pumps to be installed in PHED campus at Luni Head Works. Area is protected with boundary wall and state highway 68 passes close to the HW boundary. Situated at eastern side of town, The land belongs to PHED, Government of Rajasthan. Site is predomantly flat with sandy soil, with no trees	 Samdari Head works location  Pumps at Samdhari Pumphouse  Pumphouse at Samdhari HW  Pumphouse at Samdhari HW
3	installation of 4 pups (3.97 MLD and 2.70 MLD) at Luni Head Works	Pumps to be installed in PHED campus at Luni Head Works at south part of town. Area is protected with boundary wall and Jarola Road passes close to the HW boundary. The land belongs to PHED, Government of Rajasthan. Site is predomantly flat with sandy soil, with no trees	 Luni Head Wroks

S. No	Subproject component	Environmental Features of the Site	Photographs
			 Pumphouse at Luni HW
4	Sewer networks	Sewer network pipes will be laid in different city roads and streets of Balotra town. Sewer pipes will not be laid in the area where existing sewer networks are functioning satisfactory. There are different residential and commercial activities along the proposed roads, where sewer networks are proposed. There are several common property resources such as community-owned facilities, hospitals, schools, religious places, public utilities, in the proposed areas. There are no environmentally, archeologically sensitive or protected areas in the proposed zone. Major localities to be covered under sewerage lines are Mangji ki Dhani, Hira Das Nagar, Arbind Colony, Arihant colony, Agarasain colony, Laxmi Nagar, Ghicha colony, Maheshwari colony, Shiv colony, Chipra colony, Adarsh colony, Shiv Nagar, Gaur colony, Pipleshwar Mahade colony, Musthfa Nagar, Shastri Nagar, Harijan Basti, etc Major roads where the sewer line will be laid are; Yogidas Vyas Road, MMDC Road, Hospital Road, etc.	 High desity area near Gorkha Circle  Mediun Denisty area

VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Introduction

107. Potential environmental impacts of the proposed infrastructure components are presented in this section. Mitigation measures to minimize/mitigate negative impacts, if any, are recommended along with the agency responsible for implementation. Monitoring actions to be conducted during the implementation phase is also recommended to reduce the impact.

108. Screening of potential environmental impacts are categorized into four categories considering subproject phases: location impacts and design impacts (pre-construction phase), construction phase impacts and operations and maintenance phase impacts.

i. **Location impacts** include impacts associated with site selection and include loss of on-site biophysical array and encroachment either directly or indirectly on adjacent environments. It also includes impacts on people who will lose their livelihood or any other structures by the development of that site.
ii. **Design impacts** include impacts arising from Investment Program design, including technology used, scale of operation/throughput, waste production, discharge specifications, pollution sources and ancillary services.
iii. **Pre-construction impacts** include impacts which are anticipated during construction works but planning are required for proposed mitigation measures before start of construction works i.e. during SIP period such as taking consents from various departments, planning for construction and workers camps, deployment of safety officer, arrangement of required barricades and caution boards etc.
iv. **Construction impacts** include impacts caused by site clearing, earthworks, machinery, vehicles and workers. Construction site impacts include erosion, dust, noise, traffic congestion and waste production.
v. **O&M impacts** include impacts arising from the operation and maintenance activities of the infrastructure facility. These include routine management of operational waste streams, and occupational health and safety issues.

109. Screening of environmental impacts has been based on the impact magnitude (negligible/moderate/severe - in the order of increasing degree) and impact duration (temporary/permanent).

110. This section of the IEE reviews possible project-related impacts, in order to identify issues requiring further attention and screen out issues of no relevance. ADB SPS (2009) require that impacts and risks will be analyzed during pre-construction, construction, and operational stages in the context of the project's area of influence. The ADB Rapid Environmental Assessment Checklist has been used to screen the project for environmental impacts and to determine the scope of the IEE.

111. In the case of this project (i) most of the individual elements are relatively small and involve straight forward construction and operation, so impacts will be mainly localized and not greatly significant; (ii) most of the predicted impacts are associated with the construction process, and are produced because that process is invasive, involving excavation and earth movements; and (iii) being located in an urban area, will not cause direct impact on biodiversity values. The project will be in properties held by the local government body and access to the project location is through public rights-of-way and existing roads hence, land acquisition and encroachment on private property will not occur.

B. Pre-Construction Impacts– Design and Location

Location Impacts

112. **Locations impacts of Water Supply and Sewerage Networks:** The water supply and sewerage collection networks will traverse through different city roads within ROW. There are no trees coming in the alignment of proposed pipeline works. Therefore, no significant impacts shall be envisaged regarding location; though some temporary disturbance are expected and

mitigation measures will be required to minimize these impacts. These works will require advance permission from concerned authority for road cutting and traffic diversion etc. If any tree cutting will be required during execution mitigation measures shall be adopted.

113. **Physical Cultural Resources – Chance find.** There are no notable or significant archeological places or protected monuments or areas in and around the project locations in the town. Therefore, no impacts envisaged but risk of uncovering archaeological remains, given the long history of town, during the excavations cannot be ruled out completely. Construction contractors therefore should follow the below measures in conducting any excavation work:

(i) Create awareness among the workers, supervisors and engineers about the chance finds during excavation work;
(ii) Stop work immediately to allow further investigation if any finds are suspected;
(iii) Inform archeology department /Museum office if a find is suspected and take any action, they require to ensure its removal or protection in situ; and prepare a chance find protocol

114. **Tree cutting at project sites.** There is no tree cutting is envisaged at the location of sewer and water supply network but if any tree will be impacted, tree cutting permission will be taken from concern authority and plantation of three times of trees will be done.

115. **Design of the Proposed Components.** The Central Public Health and Environmental Engineering Organization (CPHEEO) manual suggests a design period of 15/30 years[8] in general while designing the systems for water supply and sewerage components. It is proposed to consider 2055 as the design year for all the components in order to maintain unanimity in the design period and design population. Accordingly, 2025 shall be the base year and 2040 the intermediate year to cross check the designs pertaining to intermediate demand. The rate of water supply has been taken as 135 lpcd for 100% population. Sewage generation is 85% of water supply (including 5% to account for infiltration).

116. One of the critical aspects in sewerage system operation is, change in raw sewage characteristics at inlet of sewage treatment plant may affect the process and output quality. STPs has been designed for municipal wastewater, which does not include industrial effluent. Characteristics of industrial effluent widely vary depending on the type of industry, and therefore disposal of effluent into sewers may greatly vary the inlet quality at STP, and will upset process and affect the efficiency. Although legally the disposal of effluent meeting certain standards is allowed into municipal sewers (refer **Appendix C-8),** the monitoring of the same is not-practical.

117. To prohibit the industrial discharge in to municipal sewers following measures should be considered:

- No industrial wastewater shall be allowed to dispose into municipal sewers;
- No domestic wastewater from industrial units shall be allowed into municipal sewers;
- Ensure that there is no illegal discharge through manholes or inspection chambers;
- Conduct public awareness programs; in coordination with RSPCB, issue notice toall industries for compliance; and
- Conduct regular wastewater quality monitoring (at inlet and at outlet of STP) to ensure that the treated wastewater quality complies with the national effluent standards

[8] As per CPHEEO, pumps, motors, STP, storage reservoirs are to be designed for a life of 15 years.

118. **Mixing of industrial effluent in wastewater**. One of the critical aspects in sewerage system operation is, change in raw sewage characteristics at inlet of sewage treatment plant may affect the process and output quality. STP is designed for municipal wastewater, which does not include industrial effluent. Characteristics of industrial effluent widely vary depending on the type of industry, and therefore disposal of effluent into sewers may greatly vary the inlet quality at STP and will upset process and affect the efficiency. While the project does not provide sewerage system in established industrial areas, there is a risk of industrial effluent joining municipal sewers from the small/household units established in town areas where sewers are being provided. Mixing of industrial effluent will severely deteriorate the quality of treated wastewater, and therefore the proposed reuse. Reuse of such water may have significant impact on public health, and on land and water. Following measures should be incorporated to safeguard the sewerage system and the intended reuse:

(i) No industrial wastewater shall be allowed to dispose into municipal sewers;
(ii) As there is a risk of potential mixing of industrial waste, no domestic wastewater from industrial units shall be allowed into municipal sewers;
(iii) Ensure that there is no illegal discharge through manholes or inspection chambers;
(iv) Conduct public awareness programs in coordination with RSPCB and CLC; and
(v) Conduct regular wastewater quality monitoring (at inlet and at outlet of STP) to ensure that the treated wastewater quality complies with the effluent standards.

119. **Design of Sewer system - collection & conveyance.** The sewerage system is designed as a separate system of sewage collection (i.e., caters only to domestic wastewater). There is considerable length of existing surface drains in the project area that can be used for disposal of storm runoff. The underground gravity sewers will carry sewage from households to trunk sewers and further to STP. To maximize the benefits as intended, Balotra Nagar Parishad should ensure that all existing septic tanks are phased out by bypassing the inlet and connecting the toilet discharge from each house directly to sewerage system.

120. Accumulation of silt in sewers in areas of low over time, overflows, blockages, power outages, harmful working conditions for the workers cleaning sewers etc. are some of the issues that needs to be critically looked into during the sewer system design. A properly designed system is a must for system sustainability.

121. Measures such as the following shall be included in sewer system design to ensure that the system provides the benefits as intended:

- Limit the sewer depth where possible
- Sewers shall be laid away from water supply lines and drains (at least 1 m, wherever possible);
- In all cases, the sewer line should be laid deeper than the water pipeline (the difference between top of the sewer and bottom of water pipeline should be at least 300 mm)
- If unavoidable, where sewers are to be laid close to storm water drains, appropriate pipe material shall be selected (stoneware pipes shall be avoided)
- For shallower sewers and especially in narrow roads, use small inspection chambers in lieu of manholes;
- Design manhole covers to withstand anticipated loads & ensure that the covers can be readily replace if broken to minimize silt/garbage entry
- Ensure sufficient hydraulic capacity to accommodate peak flows & adequate slope in gravity mains to prevent build up of solids and hydrogen sulfide generation

- Take necessary precautionary measures to protect sewer network, and to avoid disposal of solid wastes, debris, wastewater into newly laid sewers from the time it is constructed to the start of operation phase.

122. **Faecal Sludge and Septage Management**. The proposed FSSM will help the ULB to cover entire population with safe disposal of human excreta by serving areas which are not feasible to be provided with a sewerage system. Under the FSSM, faecal sludge/septage will be collected from the household level septic tanks using truck mounted mobile desludging equipment and transported to STP for treatment. At this stage, the quantity of septage generated from this area is not available. This will be estimated during the detailed design phase, and number of mobile tankers required to collect the transport the septage to STP, frequency of collection depending on the size of septic tanks etc., will be worked out accordingly. Although handling, transportation and disposal into STP is completely mechanized, the system will however be operated by the workers, therefore proper precautions as workers will be dealing with highly harmful septage. Accessibility of septic tanks to mobile suction tankers to collect septage is critical for success of the septage management system. At STP, the septage will be mixed with the sewage and will be treated combined in the STP. Septage will be in concentrated and partially degraded form, and disposal of the same into STP inlet stream may upset the sewage treatment process, may generate bad odors, and may ultimately affect the quality of treated wastewater. Treatment process needs to be properly designed. Following measures are suggested for implementation:

(i) Conduct detailed survey of the households to be covered with FSSM to design the system to suit the local conditions, such as type of septic tanks and their location in the houses;
(ii) Create awareness program on the FSSM from collection to treatment system that will be adopted;
(iii) Design the sewage treatment process duly considering mixing of septage;
(iv) Ensure that the FSSM system is completely mechanized no human touch, even accidentally, from collection at household to discharge into STP, and in periodic cleaning of tankers;
(v) Demarcate a proper area for cleaning of mobile tankers in STP premises, and ensure that the wastewater shall be discharged into STP;
(vi) Provide proper training to the workers, and staff in safe handling of FSSM tasks, provide all necessary personal protection equipment, eliminate any risks to the workers and the communities by providing proper training and necessary PPEs to workers. Safeguards induction prior to start of works will include detailed instructions handling, managing and protection from diseases and other biological hazards;
(vii) Ensure proper facilities for workers including showers, wash areas, toilets, drinking water, eating and resting places;
(viii) Conduct regular health checks; and
(ix) Prepare health and safety plan for FSSM.

Design of Water supply components

123. **Technical design of the water supply components**: Distribution network, connections, flow meters, etc., follows the relevant national planning and design guidelines, focusing on providing a robust system which is easy to operate, sustainable, efficient and economically viable. Besides, the project also included the following environmental considerations:

(i) Discontinuation of current unsustainable groundwater wells and keeping only sustainable wells and creating a new comprehensive water supply system based on a nearest surface water

sources. Ground water only in case of repair and maintenance of surface water infrastructure and lean season of water
(ii) To the maximum extent possible nearest surface water source is adopted.
(v) Appropriate location of intake to ensure water availability throughout the year
(vi) Recovering backwash water from treatment process.
(vii) Treatment and disposal management of sludge from treatment process.
(viii) Minimizing water losses from pipelines by perfect jointing and alignments
using appropriate techniques (HDPE pipes up to 150 mm dia joined by electro fusion couplers using on-site electro fusion welding, and all higher dia pipes by on site butt welding)
(ix) Designing the entire system to maintain optimal flow and terminal pressure, and optimising the overall energy usage
(x) Reducing the incidence of water borne diseases by providing 100% population including urban poor with potable water supplies
(xi) Improve water use efficiency and reduce water wastage at household level by recording and monitoring the water usage, and charging the consumers as per usage; due consideration to urban poor
(xii) Minimize unaccounted for water (UFW) losses using district metered area approach with flow meter and pressure logging arrangements to identify and rectify the leaks, and unauthorized connections
(xiii) Using low-noise and energy efficient pumping systems

Selection of Source for water supply

124. Presently water from Pokran - Falsoond – Balotra - Siwana Water Supply Project (PFBS) is being reaching to both head works. 450 mm DI-K9 pipe is laid from jasol phatak off take point to both head works. Presently out of 14.50 MLD clear water about 5.50 MLD water is feeded to CWRs located at luni head works and about 9.0 MLD water is fed to CWRs located at samdari road head work with the supply of 20 hrs., from PFBS project based on Indira Gandhi Main Canal (IGMC) to provide treated water to meet the drinking water requirement of Balotra Town (It also serves other towns). The implementation of this project is completed and treated water is already reaching the project town.

125. The total clear water demand at the year 2040 and 2055 is 16.95 and 19.05 MLD (including distribution and transmission losses), which will be delivered from the PFBS Lift Water Supply Project at both existing H/Ws, i.e., Luni H/W and Samdari Road H/W, where CWRs of sufficient capacity are already available. From these H/Ws the water shall be pumped to the ESRs of respective zones. From these ESRs water shall be supplied to the consumers by gravity.

126. The total water demand included for Balotra town in the PFBS Lift Water Supply Project is as under: Intermediate demand at the year 2023: 14.50 MLD, Ultimate demand at the year 2038: 19.56 MLD, Thus, the existing water allocation is sufficient for the proposed scheme up to ultimate design year 2055.

C. Environmental Audit of Existing Water Supply Infrastructure

127. It is designed to utilize existing water supply infrastructure like tube wells, clear water reservoirs, pump houses etc. with necessary improvements. As per the ADB SPS 2009, these are associated facilities and therefore the component operation shall comply with the ADB and applicable environmental laws of India. Besides, ADB SPS lays emphasis on impacts and risks on biodiversity and natural resources, pollution prevention abatement including hazardous waste,

occupational health and safety, community health and safety, and physical cultural resources. A random environmental audit is conducted to (i) assess the compliance of the existing infrastructure with environmental legislations and (ii) improve environmental performance to minimize future potential liabilities. The preliminary audit note is given in **Appendix 3**. A more detailed environmental audit and risk assessment shall be carried out during detailed design stage and incorporated into the final IEE.

128. All the existing infrastructure facilities are located in Balotra Town, which is an urban area and where there are no protected or sensitive environmental areas such as forests, wildlife sanctuaries or archeologically protected areas. Therefore, there are no risks or impacts on biodiversity and natural resources. The designed project will optimally utilize the surface and groundwater sources. Due to nature of components, the existing infrastructure components do not fall under the ambit of any environmental related regulations, and therefore there is no requirement of permissions or clearances. Presence of Asbestos Containing Material (ACM) in the form of asbestos cement pipes in the existing water supply infrastructure is a cause of concern due to its potentially hazardous nature. Project, however, do not include rehabilitation or repair of AC pipes, and the project, in fact, designed to discontinue the use of AC pipes. Presence of AC pipes in the existing facilities may create hazardous conditions for the workers and surrounding community. Besides, the generation and disposal of debris and discarded materials, and construction phase health and safety need to be considered and mitigated to comply with the SPS provisions. Following **Table 22** provides component wise compliances and concerns. Corrective actions for the identified environmental concerns are discussed in the following section.

Table 22: Environmental Audit of Existing Facilities

Infrastructure	Details	Designed Rehabilitation	Compliance with environmental regulatory framework	Environmental Concerns
1 WTP	1. 119 MLD at Biliya, Pokran	This WTP is completed in May 2014 under PFBS Water Supply Project and treated water is being supplied to Balotra from this WTP.	No project component is proposed at WTP.	CTE and CTO is required from RSPCB but but not yet taken
4 Clear water reservoirs (CWRs)	2. Luni H/Ws, RCC CWR,600 KL 3. Luni River H/Ws, RCC CWR,650 KL 4. Samdari Road H/Ws, RCC CWR,1100 KL 5. Luni H/Ws, RCC CWR,1700 KL	The present condition of these CWRs is satisfactory, hence proposed to be used in this project. Some minor repairing and water proof painting is suggested.	No requirements under existing laws	NO storage of AC pipes in existing campus Occupational health and safety, public safety during the construction works
7 nos. OHSR	1. At Luni H/W 1500 KL, 2. At City Park 850 KL, 3. At Gandhi Pura 550 KL	Civil repairs and rehabilitation, replacement of pipes, connections, electrical and mechanicals parts as required Cleaning.	No requirements under existing laws	NO storage of AC pipes in existing campus Occupational health and safety, public

Infrastructure	Details	Designed Rehabilitation	Compliance with environmental regulatory framework	Environmental Concerns
	4. At ward number 42, 700 KL	New construction (proposed by PHED). Work order issued.		safety during the construction works
	5. Near Krishi Mandi 600 KL	Civil repairs and rehabilitation, replacement of pipes, connections, electrical and mechanicals parts as required Cleaning.		
	6. At Samdari road H/Ws 400 KL			
	7. At Ranuja 1750 KL			
Pumping Machinery	Luni H/W	Civil repairs and rehabilitation, replacement of pipes, connections, electrical and mechanicals parts as required Cleaning	No requirements under existing laws	Presence of AC pipes in existing connections Occupational health and safety, public safety during the construction works Disposal of discarded material, debris including AC pipes
Existing Rising Mains	6 km long >300 dia AC/PVC pipelines	Will be replaced by DI K9.	No requirements under existing laws	Presence of AC pipes in existing connections Occupational health and safety, public safety during the construction works Disposal of discarded material, waste oils, mechanical and electrical parts, debris including AC pipes
	27.50 km <=300 dia AC/PVC pipelines	Not used as pipeline laid from TWs to CWRs.		
	4 km long <=300 dia Metallic pipelines (M.S.)	Will be replaced by DI K9.		
	3.5 km 250 mm dia Metallic pipe lines DI pipe	Will be utilized.		
Existing Distribution System	236 km long AC/PVC pipes in existing supply	Will be replaced	No requirements under existing laws	Presence of AC pipes in existing connections Occupational health and safety, public safety during the construction works Disposal of discarded material,

Infrastructure	Details	Designed Rehabilitation	Compliance with environmental regulatory framework	Environmental Concerns
				waste oils, mechanical and electrical parts, debris including AC pipes
Sewerage Component				
Existing 9 MLD STP	Existing STP of 9 MLD at Jerla Village,	No Change in existing 9 MLD STP	9 MLD STP based on SBR technology constructed under UIDSSMT Scheme, and under operation): CTE of Existing STP is already expired in 30 June 2016 and CTO is Under Process : 2021-2022/ Balotra/8721 Dated 28/10/2021	Occupational health and safety, public safety during the construction works, High coliform in treated water. No proper sludge disposal

129. **Corrective Measures**. The CTE and CTO under water act has not yet taken from RSPCB, PMU to ensure that CTE and CTO are applied and taken before start of project for both WTP and STP. The environmental concerns are mainly related to occupational health and safety, public safety, disposal of debris, discarded materials etc. A work specific environmental management plan needs to be prepared for these aspects. The exact nature of rehabilitation and repair works will be known only during the detailed design phase as the detailed technical audit will be conducted by the DBO contractor and the required rehabilitation and repair measures will be designed accordingly. Therefore, a separate EMP will be prepared for rehabilitation works during the detailed design phase by the DBO contractor, and reviewed and approved by PMU/consultants, and the same will be implemented by the DBO contractor. These are included in the EMP.

130. **Corrective Action Plans for existing STP :** As presented in the above table, The STP **required** CTO under Water act which is already applied and under process and it will be taken before start of project. The environmental concerns are mainly related to occupational health and safety, public safety, disposal of debris, discarded materials etc.

131. **No permanent sludge drying beds** - Presently, sludge is being dried in a temporary RCC structure near the centrifugal pump. A proposal to construct a sludge drying bed in the North East corner of the existing STP is being considered by Municipal Council, Balotra with their own **funds**. Sufficient land is available in STP premises to construct sludge drying beds. Also it is proposed to use the dried sludge in various permissible activities, including the use as fertilizer as most of the land in STP proximity is agricultural land.

132. **High coliform in treated water** - High coliform in treated water is a serious concern as it **indicates** the presence of harmful bacteria and viruses that can cause various waterborne diseases. The existing Sewage Treatment Plant (STP) has been found to have higher coliform numbers in treated water, which is a clear indicator of malfunctioning of the STP.

133. The recently appointed operator, along with Municipal Council Balotra, is assessing the system to identify the root cause of the problem. It is likely that faulty equipment or processes are responsible for the high coliform count in treated water. The operator and Municipal Council Balotra have committed to using their own funds to change the faulty equipment or process to ensure that the STP functions effectively and produces safe, clean water.

Asbestos Containing Materials (ACM) Management.

134. No ACM is proposed to be used in the subproject construction. There are however ACM in the existing water supply infrastructure, which may be disturbed or come in contact with the workers and general public and may have serious health implications. This is already discussed in under the existing facilities audit, and necessary measures are suggested.

135. Existing water distribution network is mostly of asbestos cement (AC) pipes. As per PHED information about 33.5 km of AC pipes of various dia is present in existing distribution networks. There is requirement of placing new pipelines to replace the old AC pipes, the existing AC pipes shall be made abandoned and left in situ and new pipe lines shall be laid parallel to it, therefore it will not attract specific mitigation measures for demolition, handling, transportation and disposal. Assessment of quantity of replacement of AC pipes is required during the detail design before start of construction works. Details will be obtained from the PHED of the nature and location of all water supply infrastructure, and planning pipe line alignments carefully to avoid any conflict or damage. Given the dangerous nature of this material for both workers and citizens, additional measure should be taken to protect the health of all parties in the event (however unlikely) that AC pipes are encountered. This is that, prior to start of construction works of water supply system, contractor will develop a protocol to be applied in any instance that AC pipes are encountered, to ensure that appropriate action is taken. This should be based on the approach recommended by ADB for "protecting workplaces and communities from asbestos exposure risks (Good Practice Guidance for the Management and Control of Asbestos: Protecting Workplaces and Communities from Asbestos Exposure Risks[9] (March 2022)), United States Environmental Protection Agency (USEPA), and amongst other things, should involve:

(i) Contractor is required to develop AC management plan and protocol and submit in PIU and strictly follow during implementation of the project;
(ii) Training of all personnel (including manual labourers) to enable them to understand the dangers of AC pipes and to be able to recognize them in-situ;
(iii) Reporting procedures to inform PIU immediately if AC pipes are encountered.
(iv) Development and application of a detailed H&S procedure to protect both workers and citizens. This should comply with national and international standards for dealing with asbestos, and should include: (a) removal of all persons to as a distance; (b) usage of appropriate breathing apparatus and protective equipment by persons delegated to deal with the AC material
(v) Procedures for the safe removal and long-term disposal of all asbestos-containing material encountered

[9] https://www.adb.org/publications/good-practice-management-control-asbestos

136. Bureau of Indian Standards (BIS) Guidelines for Safe Use of Products containing asbestos states that “asbestos cement products (such as asbestos cement pipes) generally contain about 10-15% asbestos fibers in a cement matrix that comprises the rest of the materials and are termed as locked in asbestos products as these products have the asbestos fibers bound in cement. There is very little possibility of generation of airborne asbestos fibers during any reasonable handling, storage, and use of such products. However, during storing and installation, recommended work practices shall be followed to avoid harmful exposure”. According to Hazardous and other Wastes (Management and Transboundary Movement) Rules, 2016, any waste having asbestos concentration limit of 10,000 mg/kg (i.e. 1%), however this will apply only if the asbestos containing substances are in a friable, powdered or finely divided state. Under the Basel Convention,10 asbestos or asbestos waste in the form of dust and fibers is classified as hazardous waste.

137. Working with or handling asbestos cement pipes in manner that produces dust, fibres, air borne particles etc., is very harmful and hazardous to the workers and general public around the work sites. The condition of existing underground asbestos cement pipes is not known, however, as these are old, pipes may be in deteriorated conditions. Condition needs to be assessed to check whether it is in friable form or in a condition in which it can release fibres before it is subjected any disturbance or removal.

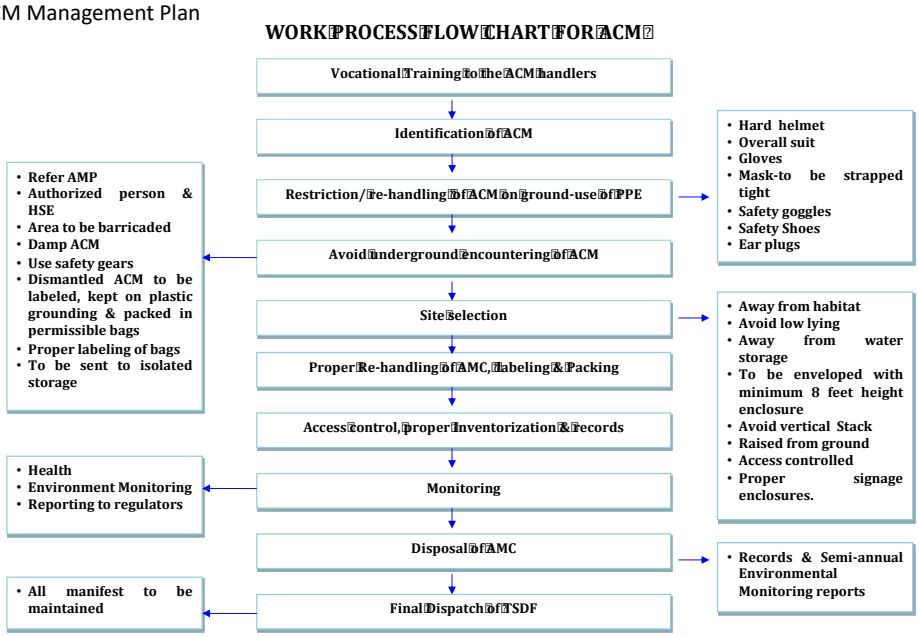
138. As per above discussions, it is therefore obvious that specific measures are necessary to safeguard the health and safety of the project workers and nearby communities; consistent with the requirements of the ADB SPS, 2009. Activities such as clearing, transfer and disposal of asbestos cement pipes, work in narrow streets, and interventions in existing asbestos cement pipes may have adverse impacts on workers and surrounding population. Air borne asbestos if handled unsafely, cut, drilled or broken into pieces that may cause health issues such as Inflammation of the lungs, mesothelioma, peritoneal mesothelioma, pleural plaques, asbestosis and bronchogenic carcinoma. Following measures are to be implemented to avoid any impacts:

(i) Develop and implement the ACM Management Plan (AMP) that includes identification of hazards, the use of proper safety gear and disposal methods. Sample AMP is provided in **Appendix C-20**. Adhere to the workflow process suggested in **Figure 14;**
(ii) Conduct awareness program on safety during the construction work;
(iii) Undertake the construction work stretch-wise; excavation, pipe laying and trench refilling should be completed on the same day;
(iv) Provide barricades, and deploy security personnel to ensure safe movement of people and also to prevent unnecessary entry and to avoid accidental fall into open trenches;
(v) Identify risk of intervention with existing asbestos cement pipes. If there is significant risk, implement the AMP strictly that includes identification of hazards, the use of proper safety gear and disposal methods;
(vi) Appropriate actions as defined in the AMP will have to be adhered to; and
(vii) Maintain records of asbestos cement pipes as per the AMP.

[10] Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, adopted in 1989.

Figure 14: ACM Management Plan – Work Process Flow Chart

ANNEX 1 – ACM Management Plan



139. Requirement for the contractor and the subcontractor. The following are operational requirements related to works involving asbestos:

(v) engaging certified and competent asbestos service provider to identify, handle and remove the asbestos materials present and encountered in the project sites;

(vi) adopting good practices per EHS Guidelines[11] to minimize the health risks associated with asbestos materials by avoiding their use in new construction and renovation, and, if installed asbestos-containing materials are encountered, by using internationally recognized standards and best practices to mitigate their impact;[12]

(vii) training of workers and supervisors, possession of (or means of access to) adequate equipment and supplies for the scope of envisioned works, and a record of compliance

[11] ADB SPS specifies application of pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's *Environment, Health and Safety (EHS) Guidelines.* These standards contain performance levels and measures that are normally acceptable and applicable to projects. When host country regulations differ from these levels and measures, the borrower/client will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the borrower/client will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in this document.

[12] The EHS Guidelines specify that the use of ACM should be avoided in new buildings and construction or as a new material in remodeling or renovation activities. Existing facilities with ACM should develop an asbestos management plan that clearly identifies the locations where the ACM is present, its condition (e.g., whether it is in friable form or has the potential to release fibers), procedures for monitoring its condition, procedures to access the locations where ACM is present to avoid damage, and training of staff who can potentially come into contact with the material to avoid damage and prevent exposure. The plan should be made available to all persons involved in operations and maintenance activities. Repair or removal and disposal of existing ACM in buildings should be performed only by specially trained personnel following host country requirements or, if the country does not have its own requirements, internationally recognized procedures. Decommissioning sites may also pose a risk of exposure to asbestos that should be prevented by using specially trained personnel to identify and carefully remove asbestos insulation and structural building elements before dismantling or demolition.

with regulations on previous work;

(viii) removal, repair, and disposal of ACM shall be carried out in a way that minimizes worker and community asbestos exposure, and require the selected contractor to develop and submit a plan, subject to the PMU and PIU's acceptance, before doing so;

(ix) providing adequate protection to its personnel handling asbestos, including respirators and disposable clothing; and

(x) notifying the Rajasthan State Pollution Control Board (RSPCB) of the removal and disposal according to applicable regulations as indicated in the technical requirements and cooperating fully with representatives of RSPCB during all inspections and inquiries.

140. PMU will engage an asbestos management specialist to provide training and awareness, and to coordinate with various stakeholders on the risks, management, and mitigation measures required for the identification, safe handling, transport and disposal of the asbestos materials.

D. Pre-construction Impacts

141. Utilities. Telephone lines, electric poles and wires, water lines within the proposed project locations may require to be shifted in few cases. To mitigate the adverse impacts due to relocation of the utilities, the contractor, in collaboration with ULB will identify the locations and operators of these utilities to prevent unnecessary disruption of services during construction phase; and instruct construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services.

142. **Site selection of construction work camps, stockpile areas, storage areas, and disposal areas.** Priority is to locate these near the project location. However, if it is deemed necessary to locate elsewhere, sites to be considered will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems. Residential areas will not be considered for setting up construction camps to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust and noise and to prevent social conflicts, shortages of amenities and crime). Extreme care will be taken to avoid disposals near forest areas, water bodies, swamps or in areas which will inconvenience the community. Construction sites will be selected by DBO contractor in compliance with these conditions and the same will be reflected in Site Environmental Management Plan (SEMP) which is to be prepared by DBO contractor prior to start of construction and approved by PIU.

143. **Site selection of sources of materials.** Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution. To mitigate the potential environmental impacts, locations of quarry site/s and borrow pit/s (for loose material other than stones) would be assessed by PIU. Priority would be sites already permitted by Mines and Geology Department. If new sites are necessary, these would be located away from population centers, drinking water intakes and streams, cultivable lands, and natural drainage systems; and in structurally stable areas. It will be the construction contractor's responsibility to verify the suitability of all material sources and to obtain the approval of Department of Mines & Geology and local revenue administration. If additional quarries will be required after construction is started, then the construction contractor shall use the mentioned criteria to select new quarry sites, with written approval of PIU. DBO contractor will identify sources of water for construction purposes and obtain necessary permissions as required, and approval of PIU before the use. Details of material sources and water sources will be provided in SEMP.

144. **Debris disposal.** Prior to the commencement of works, contractor shall identify a debris disposal site in consultation with the PIU and Consultant. Contractor will prioritize the use of solid/construction waste disposal sites operated under the consent from RSPCB. Contractor will follow all the prescribed rules[13]during construction and adhering to following criteria (including but not limited to)-

- The site shall be selected preferably from barren, infertile lands. In case agricultural land needs to be selected, top-soil stripping, stacking and preservation should be undertaken prior to initiation of any activities.
- The local governing body and community shall be consulted while selecting the site.
- Contractor shall prepare a construction and demolition waste management plan in pre-construction phase for safe disposal of construction and demolition wastes as per applicable rules and submit to Nagar Parishad through PIU for approval
- Debris disposal site shall be at least 200 m away from surface water bodies[14].
- No residential areas shall be located within 100 m downwind side of the site.
- The site is minimum 250 m. away from sensitive locations like hospitals, religious places, ponds/lakes or other water bodies.The contractor shall identify the disposal site confirming to the above criteria, obtain required permissions from local body, and submit for the approval of PIU; disposal sites shall be used only after approval of the PIU

Construction Impacts

145. The civil works for the subproject include earth work excavation for sewer trenches, sewer laying, construction manholes, shifting of public utilities and providing house service connections. Earth work excavation will be undertaken by machine (backhoe excavator) and include danger lighting and using sight rails and barricades at every 100 m., while sewer laying works will include laying sewer at required gradient, fixing collars, elbows, tees, bends and other fittings including conveying the material to work spot and testing for water tightness.

146. **Laying of Water Supply and Sewer Networks.** Subproject include linear works (laying of water supply and sewage collection pipes). This covers almost entire project area of Balotra Town. Distribution lines/small sewers (tertiary sewers) will be laid in all streets and roads, the larger sewers and water mains will be laid mostly on wider main roads. Pipes/sewers will be laid by open cut method. Water pipes will be laid in the ground with or without a maximum cover of 1 m, so that depth of excavation will be up to 1.5 m-1.8 m. The maximum depth for sewers depends on the design, and in Balotra most of the sewers will be laid 1.2 m to 3.5 m below the ground, and some sewers will be laid deeper (>2 m) and maximum depth will be 6 m. As per the bid conditions, “the maximum depth of sewer is 3.5 m for open excavation; after 3.5 m sewer shall be laid by the trenchless method only. Trenchless method may also be used even where depth is less than 3.5 m for important roads in the city where traffic density is more, and in the streets where traffic diversion is not feasible etc. Sufficient care will be taken while laying so that existing utilities and cables are not damaged and pipes are not thrown into the trenches or dragged, but carefully laid in the trenches. Trenches deeper than 1.5 m will be protected by shoring/bracings to avoid collapse of trenches, and also to avoid any risk to surrounding buildings. Once they are laid, pipes will be joined as per specification and then tested for any cracks of leakages. The minimum working hours will be 8 hours daily, the total duration of each stage depends on the soil condition

[13]Construction and Demolition Waste Management Rules 2016

[14] In the absence of site meeting the stipulated criteria, an alternate site can be selected specifying the reasons. In such a case, the construction camp management plan should incorporate additional measures specific to the site as suggested by the Construction Manager.

and other local features. Extraneous soil after backfilling of trenches shall be used for filling low lying area or stored/ dumped in approved debris disposal sites.

147. Although construction of these project components involves quite simple techniques of civil work, the invasive nature of excavation and the project locations in the built-up areas of the town where there are a variety of human activities, will result in impacts to the environment and sensitive receptors such as residents, businesses, and the community in general. The anticipated impacts are temporary and for short duration. A detail survey is needed after finalization of alignment to access the feasibility of the alignment for need of any tree cutting, demolition of any structure, road and railway crossings, pipe laying in any private land, presence of any sensitive receptor along alignment, disturbance to public or business etc. Mitigation measures have been prepared for potential adverse impacts. Prior consent from land owners (if pipe laying is required in private land) and NOC from concerned departments (for pipe laying in roads, road/railway crossings etc) prior to start of construction works, is required

148. Physical impacts will be reduced by the method of working and scheduling of work, whereby the project components will be (i) constructed by small teams working at a time; (ii) any excavation done near sensitive area like school, religious places and house will be protected as per standard norms etc (iii) finish excavation, pipe laying and back filling of trench in the same day (iv) provide adequate barricades and road safety signage during pipe laying works in traffic areas (v) Further if night works are required (however unlikely, applicable only in extreme conditions) all the mitigation measures to reduce impacts of disturbance to minimum level to nearby habitants and road users should be ensured by contractor.

149. **Safety & Precautions**: Adequate safety measures and precautions are most important while replacing the old sewer lines/ connection of new sewer in old sewers. These precautions should necessarily comprise of:

- No entering into sewer shall be allowed
- Keep all PPEs ready all the time.
- Using gas masks while working very close to the pumping main line;
- Testing manhole rungs or steps for structural safety before using;
- Lowering all the tools to the workman in bucket and ensuring that no tools are located near the manhole edge that could fall in to the manhole;
- Using lighting equipment that are explosion and fire proof;
- Adequate and easily readable warning signs to the traffic well ahead of the work area;
- Posting flagman at the two ends of the working pumping main line to avoid traffic jams;
- Avoiding infections by using rubber gloves, gum boots, separate cloths while working; and
- By keeping records of injury with description of accident, corrective actions taken and the accident analysis. In addition to the above, an up-to-date record of maps and profiles have to be maintained duly incorporating any changes made, if any, during construction and repair works. This will help in proper maintenance of the system.
- Develop and implement site-specific Health and Safety (H&S) Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use Personal Protective Equipment (PPE); (c) H&S Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work related accidents

150. **Demolition works.** In the initial stage of project planning it is accessed that there is no requirement of demolition of structures. If any demolition works are required, proper work plan

and Mitigation measures will be required for demolition works. Structures to be demolished should be wetted through water sprinkling to reduce dust emission. Appropriate site for storage and disposal of demolished materials should be selected prior to start of demolition activities with prior permission/approval of PIU/ULB. All the safety measures should be adopted during demolition activities.

151. **Storage and Disposal of excavated earth.** A large quantity of soil will be excavated for pipe laying, repairing of CWR, pump house and other. Some part of this excavated soil will be reused for backfilling and/or surface leveling; rest of the soil will need to be disposed in other locations. Proper storage and disposal plan from contractor is required before start of the work. Prior permission from land owner/concerned authority for storage and disposal of excess earth is required. Prior to the commencement of works, Contractor will follow all the prescribed rules[15] and shall identify a debris disposal site in consultation with the PIU/ULB and adhering to following criteria:

- The site shall be selected preferably from barren, infertile lands. In case agricultural land needs to be selected, top-soil stripping, stacking and preservation should be undertaken prior to initiation of any activities.
- Debris disposal site shall be at least 200 m away from any surface water body.
- No residential areas shall be located within 200 m downwind side of the site.
- The site is minimum 250 m. away from sensitive locations like hospitals, religious places, ponds/lakes or other water bodies.
- The local governing body and community shall be consulted while selecting the site.
- Contractor is required to prepare plan for disposal of construction and demolition waste including excavated earth in the designated site/sites and submit the plan in PIU to be approved by Nagar Parishad as per Construction and Demolition Waste Rules 2016
- Soil storage site should be properly demarcated by fencing and information board should be placed at entrance
- At soil storage site soil should be covered by tarpaulin or regular water sprinkling should be done to reduce dust emission
- At soil disposal site the disposed soil should be levelled on daily basis and no heap or mound should be left at end of the day

152. **Sources of Materials.** Significant amount of gravel, sand, coarse aggregate, and cement will be required for this project. The construction contractor will be required to:

- Use material sources permitted by government[16];
- Verify suitability of all material sources and obtain approval of PIU;
- Ensure that the loading and unloading of the materials and the transportation of the materials from source to construction site does not cause impact on health and safety of the workers and the community; and
- Submit to PIU on a monthly basis documentation of sources of materials. If contractor is purchasing ready mix concrete, asphalt/macadam and aggregates from third party,

[15] Construction and Demolition Waste Management Rules 2016 and Solid Waste Management Rules (refer appendix 8)/ Table 1

[16]CTE and CTO will be required for batching plant, hot mix plant, crushers etc. if specifically established for this project. If contractor is purchasing raw material or ready mix concrete, asphalt/macadam and aggregates from third party, he has to be assured that third party is having CTE/CTO from RSPCB and should collect the copy of these and submit to PIU/consultants. Quarry sites should also have the desired permissions.

contractor will assure that all the parties/ suppliers are having CTE/CTO from RSPCB and will collect the copy of these certificates and submit to PIU/consultants

153. **Air Quality.** Emissions from construction vehicles, equipment, and machinery used for excavation and construction will induce impacts on the air quality in the construction sites. Anticipated impacts include dusts and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulphur oxides, particulate matter, nitrous oxides, and hydrocarbons. These however will be temporary limiting to construction activities only. To mitigate the impacts, construction contractors will be required to:

- Consult with PIU/on the designated areas for stockpiling of soils, gravel, and other construction materials;
- Damp down exposed soil and any stockpiled material on site by water sprinkling;
- Use tarpaulins to cover sand and other loose material when transported by trucks;
- Clean wheels and undercarriage of haul trucks prior to leaving construction site;
- Don't allow access in the work area except workers to limit soil disturbance and prevent access by barricading and security personnel;
- Fit all heavy equipment and machinery with air pollution control devices which are operating correctly, DGs should have proper stake height as per norms;
- Ensure all the equipment are having PUC certificates;
- Do regular water sprinkling in dusty areas to reduce dust emission during works;
- Damp down the structures before demolishing to reduce dust emission;
- Damp down on regular basis all the access ways;
- Maintain all the equipment and vehicles to reduce emission of smoke and keep pollution under control and keep records of periodic maintenance; and
- Conduct ambient air quality monitoring periodically as per Environmental Management Plan EMP

154. **Surface Water Quality.** Luni is major surface water body near the town. Luni river may be contaminated from leakage of fuel oil and lubricants during construction phase from house sewerage during operation phase. These potential impacts are temporary and short-term duration only. However, to ensure that these are mitigated, construction contractor will be required to:

- Prepare and implement a spoils management plan;
- Avoid to construct any construction camps and labour camps near to any water body and do not allow to dispose any waste or sullage in to any water body;
- Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets;
- Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with PIU on designated disposal areas;
- Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies;
- Place storage areas for fuels and lubricants away from any drainage leading to water bodies and provide impermeable lining under the storage yard of fuels and lubricants;
- Dispose any wastes generated by construction activities in designated sites;
- Keep oil tray or pans under the DG set or during maintenance of mechanical equipment to avoid oil spillage resulting soil and water pollution, and
- Conduct surface water quality Monitoring according to the Environmental Management Plan (EMP).

155. **Noise and Vibration Levels.** Construction works will be conducted along the roads in Balotra urban area, where there are majorly houses, commercial activities, few religious places and small-scale businesses. The sensitive receptors are the schools, religious places, hospitals in these areas. Increase in noise level may be caused by excavation, particularly breaking of cement concrete or bitumen roads, operation of construction equipment like concrete mixers, and the transportation of equipment, materials, and people. Vibration generated from construction activity, for instance from the use of pneumatic drills, will have impact on nearly buildings. This impact is negative but short-term, and reversible by mitigation measures. The construction contractor will be required to:

- Plan activities in consultation with PIU so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance;
- Use road cutters instead of breaker/hammer for cutting the road before excavation for pipe laying on roads
- Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach;
- Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and use portable street barriers to minimize sound impact to surrounding sensitive receptor;
- DGs being used at site should have sound reducing (acoustic) enclosures, preferably silent DGs should be used at site;
- Maintain maximum sound levels not exceeding 80 decibels (dBA) when measured at a distance of 10 m or more from the vehicle/s and equipment;
- Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity;
- Consult the custodians of important buildings, cultural and tourism authorities and local communities in advance of the work to identify and address key issues, and avoid working at sensitive times, such as religious and cultural festivals, exams of students etc.;
- Provide all workers appropriate PPEs like ear plug/muff, working in high noise conditions;
- Keep all vehicles and equipment in good conditions to avoid excessive noise generation;
- Provide noise barriers near sensitive receptors like schools, hospitals, temples, courts etc and consult in advance with sensitive receptors about the working hours (specially schools, hospitals, offices, courts etc) and avoid noisy works in those hours;
- Avoid noisy works in nights in inhabited areas to avoid any disturbance to habitants; and
- Consult in advance with habitants and inform them about the nature and duration of works
- Conduct noise monitoring according to the Environmental Management Plan (EMP)

156. **Management Plan for Night works (if required).** Following requirements should be fulfilled for construction works at night hours-

- Night works should be avoided at construction sites specially in residential areas and should be performed only when day works are not possible due to excessive traffic/public/pedestrian movement, site of cultural or religious importance, where there is huge crowd during day hours or any other unavoidable circumstances.
- Contractor should plan for night works only after directions from PMU/PIU/CMSC
- Contractor should submit plan for night works for approval from PIU.

- PIU should ensure that prior written information should be given to local authorities such as district administration, Police/traffic police, line agencies concerned, residents welfare association/business association/vyapar of the affected areas and their consents/permissions should be taken prior to start of night works.
- PIU/CMSC engineers should check and ensure that all the preparation as per management plan is done by contractor and contractor is having all the necessary equipment and materials for night works.
- Contractor is required to have following equipment/arrangements for night works-
- Contractors should have hand held noise level meter for measurement of noise during night hours
- Contractors should have hand held lux meter for the measurement of illumination during night hours
- Preferably electrical connections is available for running equipment otherwise sound proof/super silent Diesel Generator set should be available
- Sound level should not increase as per following-

Type of area of work	Maximum noise level dB(A)
Industrial	70
Commercial	55
Residential	45
Silence zone	40

- Illumination should be as follows-

Minimum illumination (lx)	Areas to be illuminated	Type of work activity
54	Illumination throughout the work area	General work area lighting, and performance of visual tasks of large size, or medium contrast, or low require accuracy
108	Illumination of work area and areas adjacent to equipment	Performance of visual tasks of medium size, or low to medium contrast, or medium required accuracy
216	Illumination of task	Performance of visual tasks of small size, or low contrast or high required accuracy or fine finish

- As far as possible ready mix concrete from batching plant to be used, otherwise the concrete should be prepared away from residential areas and brought to the site
- All the noise activity like hammering, cutting, crushing, running of heavy equipment should be done in day time and avoided in night time
- Workers engaged in night works should have adequate rest/sleep in day time before start of night works
- Worker engaged for night works should have previous experience of night works and should be physically fit for such works including clear vision in night
- All the necessary provisions of traffic aids such as traffic signals, road signage, barricades, cautions boards, traffic diversion boards etc. should be available with fluorescent/retro-reflective arrangements
- Workers should be trained before start of night works about risks and hazards of night works and their mitigation measures and should be provided all the protective aids (PPEs) including fluorescent/retro-reflective vests
- Horns should not be permitted by equipment and vehicles

- Workers should not shout and create noise
- First aid and emergency vehicles should be available at site
- Emergency preparedness plan should be operative during night works
- Old persons and pregnant women and women having small kids should not work in night time
- All the vehicles and equipment being used at night works should have adequate type of silencers/enclosures/mufflers to reduce noise
- All the vehicles should be checked for working head lamps, tail lamps, inner lights etc. before start of night works
- PIU/CMSC site engineers and contractors safety personnel should closely monitor the safety of works continuously and noise and illumination levels on hourly basis and maintain photographic and videographic records as well as register the observations
- Night works should be stopped early in the morning at least one hour before start of pedestrian/traffic movement
- After completion of night works all the site should be cleaned and maintained obstruction free for day time movement of vehicles and pedestrians
- Drivers and workers should be alert and responsive during night works
- All the wages to workers working in night hours should be as per the applicable labour acts
- Avoid any nuisance which may create problems to nearby habitants and work peacefully during night hours
- Night works should not be conducted near hospitals and during peak seasons such as peak tourist season, students' exam times etc.

157. **Landscape and Aesthetics.** The construction works may require cutting of trees and also will produce excess excavated earth, excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers, spoils, oils, lubricants, and other similar items. Haphazard disposal of these will have negative impacts on Landscape and overall aesthetics. These impacts are negative but are of short-term and reversible by mitigation measures. The construction contractor will be required to:

- Prepare and implement spoils management plan;
- Avoid stockpiling of excess excavated soils;
- Coordinate with ULB for beneficial uses of excess excavated soils or immediately dispose to designated areas;
- Recover used oil and lubricants and reuse or remove from the sites;
- Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;
- Minimize removal of vegetation and disallow cutting of trees;
- If tree-removal will be required, obtain tree-cutting permit from the Revenue Department; and
- Plant three native trees for every one that is removed.
- Remove all wreckage, rubbish, or temporary structures which are no longer required; and
- Request PIU to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.

158. **Groundwater Quality**. Another physical impact that is often associated with excavation is the effect on drainage and the local water table if groundwater and surface water collect in the

voids. Although, groundwater is much deeper than the proposed trenching depth, and rains are scarce and limited to very short duration during monsoon, to ensure that water will not pond in pits and voids near project location, the construction contractor will be required to conduct excavation works in non-monsoon season to the maximum extent possible. These potential impacts are temporary and short-term duration only. However, to ensure that these are mitigated, construction contractor will be required to:

- Prepare and implement a spoils management plan (**Appendix C-13**);
- Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets;
- Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with PIU on designated disposal areas;
- Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies;
- Place storage areas for fuels and lubricants away from any drainage leading to water bodies;
- Dispose any wastes generated by construction activities in designated sites; and
- Conduct periodical ground water quality monitoring according to the Environmental Management Plan (EMP).

159. **Accessibility.** Excavation along the roads, hauling of construction materials and operation of equipment on-site can cause traffic problems. Potential impact is negative but short term and reversible by mitigation measures. The construction contractor will be required to:

- Prepare and implement a Traffic Management Plan **(Appendix C-14**)
- Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;
- Schedule transport and hauling activities during non-peak hours;
- Locate entry and exit points in areas where there is low potential for traffic congestion;
- Keep the site free from all unnecessary obstructions;
- Drive vehicles in a considerate manner;
- Coordinate with Traffic Police for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided during peak hours; and
- Notify affected sensitive receptors by providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.

160. Wherever road width is minimal, there will be temporary loss of access to restrains and vehicular traffic (including 2-wheelers) during the laying of pipes. Under those circumstances, contractor shall adopt following measures:

- Inform the affected local population 1-week in advance about the work schedule
- Plan and execute the work in such a way that the period of disturbance/ loss of access is minimum.
- Provide pedestrian access in all the locations until normalcy is restored. Provide wooden/metal planks over the open trenches at each house to maintain the access.

161. **Socio-Economic - Income.** The project components will be located in government land and there is no requirement for land acquisition or any resettlement. Construction works will impede the access of residents to specific site in limited cases. The potential impacts are negative and moderate but short-term and temporary. The construction contractor will be required to:

- Prepare and implement spoils management plan (**Appendix C-14**);
- Leave spaces for access between mounds of soil;
- Provide walkways and metal sheets where required to maintain access across for people and vehicles;
- Increase workforce in the areas with predominantly institutions, place of worship, business establishment, hospitals, and schools;
- Consult businesses and institutions regarding operating hours and factoring this in work schedules; and
- Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.
- Notify community/ water users in advance about likely interruptions in water supply.
- Provide alternate sources of clean water until water supply is restored.
- Provide all mitigation measures as given in resettlement plan (RP) prepared for the project to mitigate impacts on vendors and shopkeepers

162. **Socio-Economic-Employment.** Manpower will be required during the 36-monthsconstruction stage. This can result in generation of temporary employment and increase in local revenue. Thus potential impact is positive and long-term. The construction contractor will be required to:

- Employ at least 50% of the labour force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available; and
- Secure construction materials from local market.

163. **Occupational Health and Safety.** Workers need to be mindful of the occupational hazards which can arise from working on roads, in height and excavation (trenches and trenchless) works. Potential impacts are negative and long-term but reversible by mitigation measures. Construction contractor will depute experienced EHS personnel and will be required to:

- Comply with all national, state and local labor laws (see **Appendix C-12**);
- Develop and implement site-specific occupational health and safety (OH&S) Plan which will include measures such as: (a) excluding public from the site; (b)ensuring all workers are provided with and use personal protective equipment;(c) OH&S Training17 for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents;
- Ensure that qualified first-aid is provided at all times. Equipped first-aid stations shall be easily accessible throughout the site;
- Provide medical insurance coverage for workers;
- Secure all installations from unauthorized intrusion and accident risks;

[17] Some of the key areas that may be covered during training as they relate to the primary causes of accidents include (i) slips, trips and falls; (ii) personal protective equipment; (iii) ergonomics, repetitive motion, and manual handling; (iv) workplace transport; and (v) legislation and responsibilities. Training can provide the foundations of competence but it does not necessarily result in a competent worker. Therefore, it is essential to assess staff competence to ensure that the training provided is relevant and effective. Supervision and monitoring arrangements shall be in place to ensure that training has been effective and the worker is competent at their job. The level of supervision and monitoring required is a management decision that shall be based on the risks associated with the job, the level of competence required, the experience of the individual and whether the worker works as part of a team or is a lone worker.

- The project area experiences extreme temperature during summer months of April and May, which may affect the health of workers engaged in construction work. Contractor should take necessary measures during summers including the following:

a. Work schedule should be adjusted to avoid peak temperature hours (12 -3 PM)
b. Provide appropriate shade near the work place; allow periodic resting and provide adequate water
c. Provide necessary medicine and facilities to take care of dehydration related health issues

- Provide supplies of potable drinking water;
- Provide clean eating areas where workers are not exposed to hazardous or noxious substances;
- Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers;
- Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted;
- Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas;
- Ensure moving equipment is outfitted with audible back-up alarms;
- Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and
- Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.

164. **Asbestos Containing Materials.** No ACM is proposed to be used in the subproject construction. There are however ACM in the existing water supply infrastructure, which may be disturbed or come in contact with the workers and general public and may have serious health implications. This is already discussed under heading **Design Impacts**, and necessary measures are suggested.

165. **Community Health and Safety.** Hazards posed to the public, specifically in high-pedestrian areas may include traffic accidents and vehicle collision with pedestrians. Potential impact is negative but short-term and reversible by mitigation measures. The construction contractor will be required to:

- Plan routes to avoid times of peak-pedestrian activities.
- Liaise with PIU in identifying risk areas on route cards/maps.
- Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure.
- Provide road signs and flag persons to warn of on-going trenching activities.

166. Some part of the town is characterized by narrow roads. Particularly, the areas located in old town have very narrow roads with dense habitation and heavy traffic and are accessible only to pedestrians. Besides impeding the access, the trench excavation and pipe laying will pose safety risks to pedestrians, and the people living in these areas. Though the width (<500 mm) and

depth (<750mm) of trench is minimal, it will pose safety risk, especially for children and elders The construction contractor will be required to:

- Trench excavation and pipeline works shall be conducted in a safe manner; if the allowing public movement along the work sites (pedestrians or vehicles as the case may be) is likely to cause safety risks, movement should be blocked temporarily and work shall be conducted; in such areas, conducting night work or working in small stretches to avoid blockage of traffic/movement no more than few hours in due consultation with the local community and ULB shall be planned;
- All trenches deeper than 1.5 m shall be provided with safety shoring/braces; and avoid open cutting method for trenches deeper than 3.5 m by adopting trenchless technology;
- Survey the surrounding vulnerable buildings for likely issues in structural stability/ differential settlement during the excavation works;
- Provide prior information to the local people about the nature and duration of work;
- Conduct awareness program on safety during the construction work;
- Undertake the construction work stretch-wise; excavation, pipe laying and trench refilling should be completed on the same day; and
- Provide hard barricades and deploy security personnel to ensure safe movement of people and also to prevent unnecessary entry and to avoid accidental fall into open trenches.

167. **Work Camps.** Operation of work camps can cause temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents, and lubricants. Potential impacts are negative but short-term and reversible by mitigation measures. The construction contractor will be required to:

- Consult PIU before locating project offices, sheds, and construction plants;
- Minimize removal of vegetation and disallow cutting of trees;
- Provide drinking water, water for other uses, and sanitation facilities for employees;
- Provided temporary rest and eating area at all work sites;
- Ensure conditions of liveability at work camps are maintained at the highest standards possible at all times; living quarters and construction camps shall be provided with standard materials (as far as possible to use portable ready to fit-in reusable cabins with proper ventilation); thatched huts, and facilities constructed with materials like GI sheets, tarpaulins, etc., shall not be used as accommodation for workers; accommodation shall meet the IFC standards for workers accommodation18 which include: provision of safe housing, availability of electricity, plumbing, water and sanitation, adequate fire protection and dormitory/room facilities; accommodation shall be in the range from 10 to 12.5 cubic meter (m3) (volume) or 4 to 5.5 square meters (m2) (surface) per worker, a minimum ceiling height of 2.10 m; a reasonable number of workers are allowed to share the same room–(standards range from 2 to 8 workers); workers with accompanying families shall be provided with a proper and safe accommodation (Suggested guidelines based on IFC benchmark standards for workers accommodation is provided in **Appendix C-21**);
- Prohibit employees from poaching wildlife and cutting of trees for firewood;
- Train employees in the storage and handling of materials which can potentially cause soil contamination;
- Recover used oil and lubricants and reuse or remove from the site;

[18] https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_gpn_workersaccommodation

- Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;
- Remove all wreckage, rubbish, or temporary structures which are no longer required; and
- Report in writing that the camp has been vacated and restored to pre-project conditions before acceptance of work.

168. **Social and Cultural Resources.** For this project, excavation will occur at locations not known to have archaeological values, so there is no risk of such impacts. Religious places such as temples are present nearby the proposed pipe line works for water supply and contractor will require to follow the mitigation measures as given below-

- Consult with concerned religious authorities, nearby people and devotees in pre-construction phase and explain the work method and duration of proposed works, take their suggestions and comments and incorporate in design the mitigation measures required
- Adjacent to religious/social/historic sites, undertake excavation and construction work in such a way that no structural damage is caused to the religious building.
- Observe the local rituals and important dates of festivals, weekly/monthly/annual religious occasions in the religious places and do not make any disturbance/hindrance/obstacles during such time to the religious places,
- provide proper signage, barricades etc. to protect public and devotees from dangers of construction works.

169. **Traffic diversion and/or road closure-** If traffic diversion and/or road closure is required for the proposed works, prior consent from traffic department will be required and prior information to affected areas and public should be disseminated through consultations by CAPC. Proper road signage and traffic aids should be provided at site. Excavation along the roads, hauling of construction materials and operation of equipment on-site can cause traffic problems. Potential impact is negative but short term and reversible by mitigation measures. The construction contractor will be required to:

- Prepare and implement a Traffic Management Plan
- Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;
- Schedule transport and hauling activities during non-peak hours Locate entry and exit points in areas where there is low potential for traffic congestion;
- Keep the site free from all unnecessary obstructions;
- Drive vehicles in a considerate manner;
- Coordinate with Traffic Police for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided during peak hours; and
- Notify affected sensitive receptors by providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.
- Maintain sufficient access to houses and shopkeepers (commercial establishments) during pipe laying work through metal sheets and temporary bridges
- Locate entry and exit points in areas where there is low potential for traffic congestion;

170. Wherever road width is minimal, there will be temporary loss of access to pedestrians and vehicular traffic including two wheelers during the laying of pipes. Under those circumstances, contractor shall adopt following measures:

- Inform the affected local population 1-week in advance about the work schedule
- Plan and execute the work in such a way that the period of disturbance/ loss of access are minimum.
- Provide pedestrian access in all the locations until normalcy is restored. Provide wooden/metal planks over the open trenches at each house to maintain the access
- Excavate only that stretch in a day that could be finished in the same day by laying of pipes and backfilling.

E. Operation and Maintenance Impacts

171. **Water Supply System.** O&M of the water supply system will be carried out by DBO contractor for 10 years and then by Balotra Nagar Parishad directly or through an external operator. The water supply system is intended to deliver potable water meeting drinking water standards (**Appendix C-1**) to the consumers at their homes. This must be ensured.

172. The system has a design life of 30 years, during which shall not require major repairs or refurbishments and should operate with little maintenance beyond routine actions required to keep the equipment in working order. The stability and integrity of the system will be monitored periodically to detect any problems and allow remedial action if required. Any repairs will be small-scale involving manual, temporary, and short-term works involving regular checking and recording of performance for signs of deterioration, servicing and replacement of parts.

173. Recurrence of pipe bursting and leakage problems in water supply system will be managed by the leak detection and water auditing surveys. The operating agency will be required to ensure that the leak detection and rectification time is minimized.

174. Following measures are suggested for implementation/compliance during the operation phase:

(i) Judiciously utilize the available surface water and groundwater resources by adapting conjunctive use; prepare a water utilization plan every year post monsoon season depending on the water storage in Dams;
(ii) Ensure that dead storage is always maintained in Dams; utilize only available live storage for water supply;
(iii) Prepare and implement contingency plan for low rainfall years that will result in low water levels in Dams; in such cases revise the water supply rate appropriately to ensure uninterrupted water supply throughout the year; provide prior information to stakeholders;
(iv) Ensure that water supplied to the consumers at all times meet the drinking water standards; carry out regular sampling and testing, and disseminative information;
(v) Ensure zero wastewater discharge from the water treatment process via collection and recirculation of process wastewater/backwash water;
(vi) Implement sludge management plan; ensure collection, processing, drying, and safe disposal/reuse accordingly;
(vii) Assess composition and characteristics of sludge from the first batch operation at the initial phases, and confirm the handling, management and disposal/reuse actions suggested in the management plan;
(viii) Conduct periodic testing of sludge as per the EMP;
(ix) Ensure valid consent to operate (CTO) from RPCB for operation of WTP and STP;

(x) Ensure that all conditions/standards prescribed by RPCB are complied duly;
(xi) Ensure that chlorinator facility is operated only by trained staff and as per the standard operating procedures; in case of any accident and/or maintenance activity, ensure that the staff follows documented procedures only; and
(xii) Implement emergency response system (ERS) for the chlorine leakage; Guidelines and Emergency plan for handling and storing chlorine is attached as **Appendix C-22**.

Sewerage System. O&M of the sewerage system will be carried out by DBO contractor for 10 years and then by Balotra Nagar Parishad directly or through an external operator. The sewerage system is intended to collect, convey, treat and dispose the sewage from the town areas safely.

175. During the operation phase, it is necessary that the facility is operated by trained staff as per the standard operating procedures. Following measures are suggested for implementation/ compliance during the operation phase:

- Ensure that treated wastewater meets the established discharge standards all times; conduct regular wastewater quality monitoring (at inlet and at outlet of STP) to ensure that the treated effluent quality complies with design standards;
- Ensure implementation of reuse plan, and ensure intended quality for each direct reuse;
- Assess composition and characteristics of sludge from the first batch operation at the initial phases, and confirm the handling, management and disposal/reuse actions suggested in the management plan;
- Conduct periodic testing of dried sludge/compost to check presence of heavy metals and confirming the concentrations to use as compost as specified in the Standards for Composting, Schedule II A, Solid Waste Management Rules, 2016, Fertilizer Control Order (FCO), 1985, amendments in 2009 and 2013. It shall not be used for food crops;
- Ensure valid consent to operate (CTO) from RSPCB for operation of STP;
- Ensure that all conditions/standards prescribed by RSPCB are complied duly;
- Ensure that chlorinator facility is operated only by trained staff and as per the standard operating procedures; in case of any accident and/or maintenance activity, ensure that the staff follows documented procedures only;
- Implement emergency response system (ERS) for the chlorine leakage; Guidelines and Emergency plan for handling and storing chlorine is attached as **Appendix C-22**;
- Ensure proper knowledge transfer, hands-on training to municipal staff engaged in STP operation has been provided by contractor prior to handover of facility;
- Operate and maintain the facility following standard operating procedures of operational manual;
- Undertake preventive and periodic maintenance activities as required;
- Conduct periodic training to workers; ensure that all safety apparatus at STP including personal protection equipment are in good condition all times; and are at easily accessible and identifiable place; periodically check the equipment, and conduct mock drills to deal with emergency situations;
- No wastewater from industrial premises (including domestic wastewater) shall be allowed to dispose into municipal sewers; monitor regularly and ensure that there is no illegal discharge through manholes or inspection chambers; conduct public awareness programs; in coordination with RSPCB.

176. There are also certain environmental risks from the operation of the sewer system, most notably from leaking sewer pipes as untreated faecal material can damage human health and contaminate both soil and groundwater. It will be imperative therefore that the operating agency

establishes a procedure to routinely check the operation and integrity of the sewers, and to implement rapid and effective repairs where necessary. There is an occupation health risk to workers engaged in sewer maintenance activities. Following measures should inter alia be followed:

- Establish regular maintenance program, including:

(a) Regular cleaning of grit chambers and sewer lines to remove grease, grit, and other debris that may lead to sewer backups. Cleaning should be conducted more frequently for problem areas;
(b) Inspection of the condition of sanitary sewer structures and identifying areas that need repair or maintenance. Items to note may include cracked/deteriorating pipes; leaking joints or seals at manhole; frequent line blockages; lines that generally flow at or near capacity; and suspected infiltration or exfiltration;
(c) Monitoring of sewer flow to identify potential inflows and outflows; and
(d) Conduct repairs on priority based on the nature and severity of the problem;
(e) Immediate clearing of blockage or repair is warranted where an overflow is currently occurring or for urgent problems that may cause an imminent overflow (e.g., pump station failures, sewer line ruptures, or sewer line blockages).

- Review previous sewer maintenance records to help identify “hot spots” or areas with frequent maintenance problems and locations of potential system failure, and conduct preventative maintenance, rehabilitation, or replacement of lines as needed;
- When a spill, leak, and/or overflow occurs, keep sewage from entering the storm drain system by covering or blocking storm drain inlets or by containing and diverting the sewage away from open channels and other storm drain facilities (using sandbags, inflatable dams, etc.). Remove the sewage using vacuum equipment or use other measures to divert it back to the sanitary sewer system;
- Prohibit/prevent disposal of wastewater/effluent from industrial units in the sewers; ensure regular checking to ensure no illegal entry of industrial wastewater into sewers;
- Develop an ERS for the sewerage system leaks, burst and overflows, etc.;
- Provide necessary health & safety training to the staff;
- Provide all necessary personnel protection equipment;
- During cleaning/clearing of manholes and sewer lines great precautions should be taken for the safety of workers conducting such works:

(f) As far as possible use remote/CCTV mechanism to identify/detect the problems in sewers and do not engage persons for this purpose;
(g) As far as possible use mechanized cleaning of manholes and sewers by using modern techniques and machines and do not engage persons for this purpose;
(h) Ensure that maintenance staff and supervisors understand the risks; provide proper instructions, training and supervision;
(i) Use gas detector to detect any hazardous or inflammable gas in confined areas like sewers/manholes prior to maintenance process;
(j) Provide suitable personal protective equipment that may include waterproof/abrasion-resistant gloves, footwear, eye and respiratory protection. Face visors are particularly effective against splashes. Equipment selection and a proper system for inspection and maintenance are important;
(k) Provide adequate welfare facilities, including clean water, soap, nail brushes, disposable paper towels, and where heavy contamination is foreseeable, showers;
(l) For remote locations portable welfare facilities should be provided;
(m) Areas for storage of clean and contaminated equipment should be segregated and separate from eating facilities;

(n) Provide adequate first-aid equipment, including clean water or sterile wipes for cleansing wounds, and a supply of sterile, waterproof, adhesive dressings;
(o) Make effective arrangements for monitoring the health of staff; and
(p) Keep emergency preparedness plan ready before starting the work of sewage system cleaning.

177. Biological hazards are among the environmental risks that may adversely impact the health and wellness of the workers and the community. Breakouts of diseases such as diarrhea, flu or pandemics such as the COVID19 shall be avoided. Designs and implementation of treatment systems shall ensure that disease-causing pathogens or viruses are disinfected and will not cause any health issues.

178. **Operation of FSSM**. Households of 5 Wards will be covered with FSSM system wherein which septage from individual septic tanks at houses will be collected via mobile/vehicle mount tankers with suction equipment, transport and discharged into STP for safe treatment and disposal. Although system will be completely mechanized, given the very harmful nature of septage, following precautionary measures shall be implemented:

- Create awareness program on the FSSM in general public;
- Implement health and safety plan for FSSM;
- Provide proper training to the workers, and staff in safe handling of FSSM tasks, provide all necessary personal protection equipment and ensure their usage;
- Ensure that the system is operated completely mechanically, with least involvement of workers; there shall be no direct contact of septage to any worker or staff;
- Ensure proper facilities for workers including showers, wash areas, toilets, drinking water, eating and resting places;
- Conduct regular health checks; and
- Ensure that tankers cleaning is done mechanically, and in the demarcate area at STP, and the wastewater generated in the process shall be discharged into STP.

Cumulative Impacts

179. Cumulative impacts are those that result from the successive, incremental, and/or combined effects of a project or activity when added to other existing, planned, and/or reasonably anticipated future ones. The subproject aims to improve urban water supply and sewerage in Balotra Town, by rehabilitating, augmenting, and creating required new infrastructure.

180. Both water supply and sewerage works are proposed to be taken up simultaneously in Balotra Town, which is a small town congested with people, traffic and activities. There are sensitive places like hospitals, schools, and religious places. Works will be spread over entire town, covering all the roads and streets. Although no other notable public works are anticipated during the project implementation on public roads, there will be usual construction activities, such as building construction, as Balotra is a developing town. Given dry and windy weather conditions, dust generation from cumulative construction activities may be significant, and this may increase the particulate matter concentration in ambient air. Dust control measures suggested in the EMP aim to minimize the dust generation from the subproject construction activities. Suggested trenchless method, by avoiding excavation, will also help in reducing the overall dust generation from the subproject activities. If there are any road improvement works proposed to be implemented in Balotra , scheduling of works needs to be coordinated with the respective road agency (ULB or Public Works Department [PWD]) so that improved roads are not subjected for excavation. There is also a need to streamline water and sewer line works to avoid repeated

excavations in the same road/street. The increase in road traffic, disturbance to traffic, public safety and worker safety issues, damage to existing utilities, influx of outstation workers, etc., due to various simultaneous construction works will be notable. However, the measures suggested in the EMP will minimize these impacts greatly, and therefore effective implementation of EMP must be ensured. Thus, the net impacts are unlikely to be significant.

181. **Project Benefits.** The citizens of the Balotra will be the major beneficiaries of the improved water supply and sewerage systems, as (i) they will be provided with a constant supply of better quality water, piped into their homes at an appropriate pressure; and (ii) the human waste from the homes will be removed rapidly, which otherwise would flow in open drains. This should improve the environment, should deliver major improvements in individual and community health and well-being. The project will improve the over-all health condition of the town as water borne diseases will be reduced. Diseases of poor sanitation, such as diarrhea and dysentery, should be reduced, so people should spend less on healthcare and lose fewer working days due to illness, so their economic status should also improve, as well as their overall health.

VII. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. Overview

182. The active participation of stakeholders including local community, NGOs/CBOs, and the media in all stages of project preparation and implementation is essential for successful implementation as well as operation of the project. It will ensure that the subprojects are designed, constructed, and operated with utmost consideration to local needs, ensures community acceptance, and will bring maximum benefits to the people. Public consultation and information disclosure is a must as per the ADB policy.

183. A three-tier consultation process has been adopted for RSTDSP project: focus group discussions, primary household sample surveys and a town-level public consultation workshop. Most of the main stakeholders have already been identified and consulted during preparation of preliminary design and IEE, and any others that are identified during project implementation will be brought into the process in the future. Primary stakeholders of the subproject are: residents, shopkeepers and businesspeople who live and work alongside the roads in which network improvements will be provided, and government and utility agencies responsible for provision of services, Balotra Nagar Parishad , Public Health Engineering Department, and Rajasthan Pollution Control Board. Secondary stakeholder are: NGOs and CBOs working in the area, community representatives, beneficiary community in general, government agencies, the executing and implementing agencies (LSGD and RUDSICO-EAP), Government of India and the ADB.

B. Public Consultation

184. Informal and formal consultation are conducted with local population of the area, about at 12 places along with proposed alignment with about 54 persons in month of July and September 2022. Discussions were held about proposed project components, EMP measures, grievance redressal, ownership of land, tree cutting, wastewater, reuses of treated effluent of STP, and general people perception for proposed project. (Appendix 4). The important point discussed during the consultations were

- Difficulties in operation of existing sewerage and water supply scheme.

- Provisions/guidelines included in RUIDP contract and assured for execution of work complying all quality aspects.
- Aware of short-term impacts during the works such as dust generation, noise level, access problem, inconvenience for public and movement of vehicle. People demanded for the measures of dust suppression such as water sprinkler to control dust and noise during construction phase. Project team informed stakeholders of the proposed mitigation measures.
- It was also informed no road closures anticipated due to this work, and if needed during the construction phase, alternative access will be provided. Short term impact explained to local public and it assured that the measures will be included in the Environment Management Plan.
- Stakeholder expressed their concern regarding water charges, affordability, disturbance, and loss of business due to the work in market areas, dust, road closure etc.).
- Stakeholders also indicated that a public notice on works, and awareness programs to be conducted
- The project team explained the proposed mitigation measures to mitigate / minimize such issues. Attention of stakeholders drawn to the EMP, and explained to them how the construction phase issues by avoided, minimized, or mitigated and managed.

1. Consultation during Project Preparation

1. Institutional consultations were conducted with the Governmental Departments such as Local Self Government Department, Pollution Control Board, Public Health Engineering Department, Balotra Nagar Parishad, etc. The project proposals are formulated in consultation with Balotra Nagar Parishad and the proposals have been finalized only after certification of Nagar Parishad that the proposals suit the requirements of the ULB.

2. Focus-group discussions with residents and other stakeholders were conducted to learn their views and concerns. A social and environmental impact assessment has been conducted in the town, covering sample households and nearby vendors to understand the basic characteristics of town, health status, and the infrastructure service levels, and also the demand for infrastructure services.

3. It was observed that people are willing to extend their cooperation as the proposed activities are supposed to enhance the infrastructure service levels and the living standard of the public. The public expressed their concern regarding the nuisance and disturbance (dust, road closure and traffic management activities) during the construction stage which can have impact on their day to day activities. Public demanded for advance notice before construction and proper warning signs along the construction area to avoid accidents and inconvenience. Public opined that an appropriate operation and maintenance system should be in place, especially for sewerage system, for its best functioning and to have the maximum health and aesthetic benefits. Regarding water supply people were ready to bear cost of water through modern meters but demanded continuous supply of water in day. Regarding sewerage works people were demanding sewage house connections in whole town because they are suffering a lot due to unsafe sewage disposal in drains.

4. A town-level City Level Committee (CLC) has been formed in Barmer district by Government orders. City Level Committee meeting was organized during the initial design stage in which representatives of primary and secondary stakeholders were invited. Consultation were

also conducted with with the. CLC meeting was conducted on 13.01.2022 to discuss various issues like demand and supply gap in water supply, Improvement in existing Sewerage system, land availability, scope of works etc. under the chairmanship of District Collector in which representatives of primary and secondary stakeholders were invited. The feedback and concerns of the stakeholders have taken into consideration in detail designs of the project. Proposed works were approved by CLC members in this meeting. Minutes of Meeting of CLC vide letter dated 13.01.2022 and photographs are attached in Appendix 4.

5. A town level consultation meeting was organised on 3rd May, 2023 in Nagar Parishad Meeting hall which was attended by more then 60 persons including the elected public representatives (Chairman, Municipal Council, Balotra and its Councelors), administrative officers (Additional District Megistrate and Commissioner Municipal Council, Balotra) and safeguard profesionals of CMSC-2, CAPP experts.

2. Consultation During Construction

6. Prior to start of construction, Balotra Nagar Parishad and PIU with the assistance of Consultants will conduct information dissemination sessions at major intersections and solicit the help of the local community leaders/prominent citizens to encourage the participation of the people to discuss various social and environmental issues. At each ward/neighborhood level, focus group meetings will be conducted to discuss and plan construction work with local communities to reduce disturbance and other impacts, and provide a mechanism through which stakeholders can participate in project monitoring and evaluation.

7. A constant communication will be established with the affected communities to redress the environmental issues likely to surface during construction and operational phases and also regarding the grievance redress mechanism. Nagar Parishad /PIU with the help of Community Awareness and Participation Consultant (CAPC) will organize public meetings and will appraise the communities about the progress on the implementation of EMP. Meeting will also be organized at the potential hotspots/sensitive locations before and during the construction.

C. Information Disclosure

8. Executive summary of the IEE will be translated in the local language and made available at the offices of Nagar Parishad , RUDSICO-EAP- PMU and PIU. Copies of summary will be provided to participants of city level workshop to be organized in Balotra . Hard copies of the IEE will be accessible to citizens as a means to disclose the document and at the same time creating wider public awareness. Electronic version of the IEE in English and Executive Summary in Hindi will be placed in the official website of the Nagar Parishad /RUDSICO-EAP after approval of the IEE by Government and ADB. Stakeholders will also be made aware of grievance register and redress mechanism.

9. Public information campaigns via newspaper/radio/TV, to explain the project details to a wider population will be conducted. Public disclosure meetings will be conducted at key project stages to inform the public about the progress and future plans. Prior to start of construction, the PIU will issue Notification on the start date of implementation in local newspapers A board showing the details of the project will be displayed at the construction site for the information of general public.

10. Local communities will be continuously consulted regarding location of construction camps, access and hauling routes and other likely disturbances during construction. The road

closure together with the proposed detours will be communicated via advertising, pamphlets, radio broadcasts, road signage, etc.

VIII. GRIEVANCE REDRESS MECHANISM

A. Project Specific Grievance Redress Mechanism

11. A project-specific, three-tier grievance redress mechanism (GRM) covers both environment and social issues. The GRM will be established to receive, evaluate, and facilitate the resolution of affected persons' concerns, complaints, and grievances about the social and environmental performance at project level. The GRM will aim to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns related to the project. Assessment of the GRM designed and implemented for Rajasthan Urban Sector Development Program (RUSDP)19 the system was effective in timely resolution of grievances in a transparent manner. 20 The multichannel, project-specific, three-tier GRM is functional at RUSDP, hence the design of GRM for RSTDSP takes into account the proposed institutional structure for RSTDSP and the positive features and learnings from the previous GRM.21

12. **Common Grievance Redress Mechanism.** A common GRM will be in place for social, environmental, or any other grievances related to the project. Implementation of the resettlement plans/RIPPs/DDRs/IEEs will follow the GRM described below. The GRM will provide an accessible and trusted platform for receiving and facilitating resolution of affected persons' grievances related to the project.

13. Public awareness campaigns within entire ULB/Municipal area will ensure that awareness on grievance redress procedures is generated. The nodal officer- social/environment at field level through community awareness and public participation consultant (CAPPC) will conduct ULB/Municipal area-based awareness campaigns to ensure that poor and vulnerable households are made aware of grievance redress procedures and entitlements. Contractors will provide pamphlets to communities prior to start of works and billboards during construction. The pamphlets and billboards will include relevant environmental and social safeguards, GRM information, and contact details of key personnel from PIU and contractors.

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[19] The procedures followed for grievance redress during implementation of RUSDP Phase III included the project GRM and the pilot GRM software application (smart check) in Pali, the Sampark portal of Government of Rajasthan, and the Chief Minister's helpline. Complaints received through various channels were mostly minor and pertained to damage to existing water supply pipelines and disruption of water supply during construction, delays in road restoration, and pending new connections. Complaints related to damage to private property (compound walls/steps, etc.) were less in number. The grievances were mostly possible to resolve in coordination with the contractors. Complaints received were immediately referred by the CAPC/PMDSC supervision staff to the PIU Nodal officer (safeguards) and concerned engineer at PIU, who advised them on further action. Follow up with the contractor on complaint resolution was undertaken by PIU Nodal officer CAPC and PMDSC and final feedback sought from complainant upon resolution. Complaints requiring inter-departmental coordination were referred to the PMU for resolution, and feedback provided to complainant. The PMU kept regular track of grievances through WhatsApp and email alerts, ensuring registration and follow-up until resolution.

[20] Town-level grievance registration data indicates that a large number of grievances were registered, pointing to the effectiveness of the multi-channel GRM. No major grievance was received for RUSDP Phase III. The GRM helped smoothen the process of project implementation, hence the proposed architecture for the RSTDSP GRM remains similar, with some refinement, taking into account the changes in institutional setup proposed for project implementation.

[21] Continued logistics support at field level will be key to successful management of grievance redress under RSTDSP. The target date for establishment of the first level (PIU level) and second level (Zonal level) of GRM is before loan negotiation.

B. Grievance Redress Process

14. Affected persons will have the flexibility of conveying grievances/suggestions by dropping grievance redress/suggestion forms in complaint/suggestion boxes that will be installed by project PIUs or by e-mail, by post, or by writing in a complaints register in ULB offices/complaints register at contractor's work site[22] or by sending a WhatsApp message to the PIU[23] or by dialling the phone number of town level PIU/CAPPC or by dialling a toll-free number.[24] Any aggrieved person can also avail the facilities of online grievance monitoring system 'Rajasthan Sampark' portal to register their grievances which is a parallel mechanism of grievance registration, in addition to the project GRM.[25] Careful documentation of the name of the complainant, date of receipt of the complaint, address/contact details of the person, location of the problem area, and how the problem was resolved will be undertaken and feedback provided to the complainant on action/decision taken. The Safeguard and safety officer of town/city level PIU will have the overall responsibility for timely grievance redressal on environmental and social safeguards issues and for registration of grievances, related disclosure, with the assistance of project consultants. In case of grievances that are immediate and urgent in the perception of the complainant, the contractor, and officials of PIU with assistance from CMSC and CAPPC on-site will provide the most easily accessible or first level of contact for quick resolution of grievances. Contact numbers and names of the concerned PIU safeguard and safety officer, contractors, CAPPC and CMSC personal will be posted at all construction sites at visible locations.

(i) **1st level grievance.** The contractors, PIU executive engineer/assistant engineer designated as safeguard and safety officer (social and environment), CMSC (safeguard staff) and CAPPC can immediately resolve issues on-site, in consultation with each other and will be required to do so within 7 days of receipt of a complaint/grievance. If required, city level monitoring committee (CLMC)[26] will be involved in resolution of grievances at the 1st level;

(ii) **2nd level grievance.** All grievances that cannot be redressed within 7 days at field/PIU level will be brought to the notice of Zonal PIU headed by Additional Chief Engineer (ACE).The ACE at zonal PIU will resolve the grievance within 7 days of receipt of compliant/grievance in discussion with the ASO, field level PIU, CMSC, CAPPC and the contractor; and

(iii) **3rd level grievance.** All the grievances that are not addressed by Zonal PIU within 7 days of receipt will be brought to the notice of the PMU. Depending on the nature of grievance, the project officer (social/environment) at PMU will resolve the grievance within 15 days of receipt of grievance with necessary coordination of Zonal PIU and CMSC and guidance/instruction of additional project director (APD-PMU).

(iv) Grievances not redressed through this process within/at the project level within stipulated time period will be referred to the CLC/GRC, which has been set up.[27] In its role as a GRC,

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[22] RUSDP piloted an online application based live GRM counter for resolution of public grievances over and above the usual process of grievance registration and redressal. This app based GRM - "RUIDP Smart Check" is available at Google play store (free of cost) and is operational. The RUIDP Smart Check "app" was launched in Pali town in July 2017 and is proposed to be scaled up in RSTDSP project towns. For persons without access to the application, the traditional channels will continue to be available.

[23] It is suggested for each PIU to have a dedicated WhatsApp group for registration of grievances and receipt of quick feedback, to be followed by more formal communication.

[24] Project contractors in all project towns will have a toll-free number with specific working hours for registration of grievances related to RSTDSP.

[25] http://www.sampark.rajasthan.gov.in/RajSamWelcome.aspx

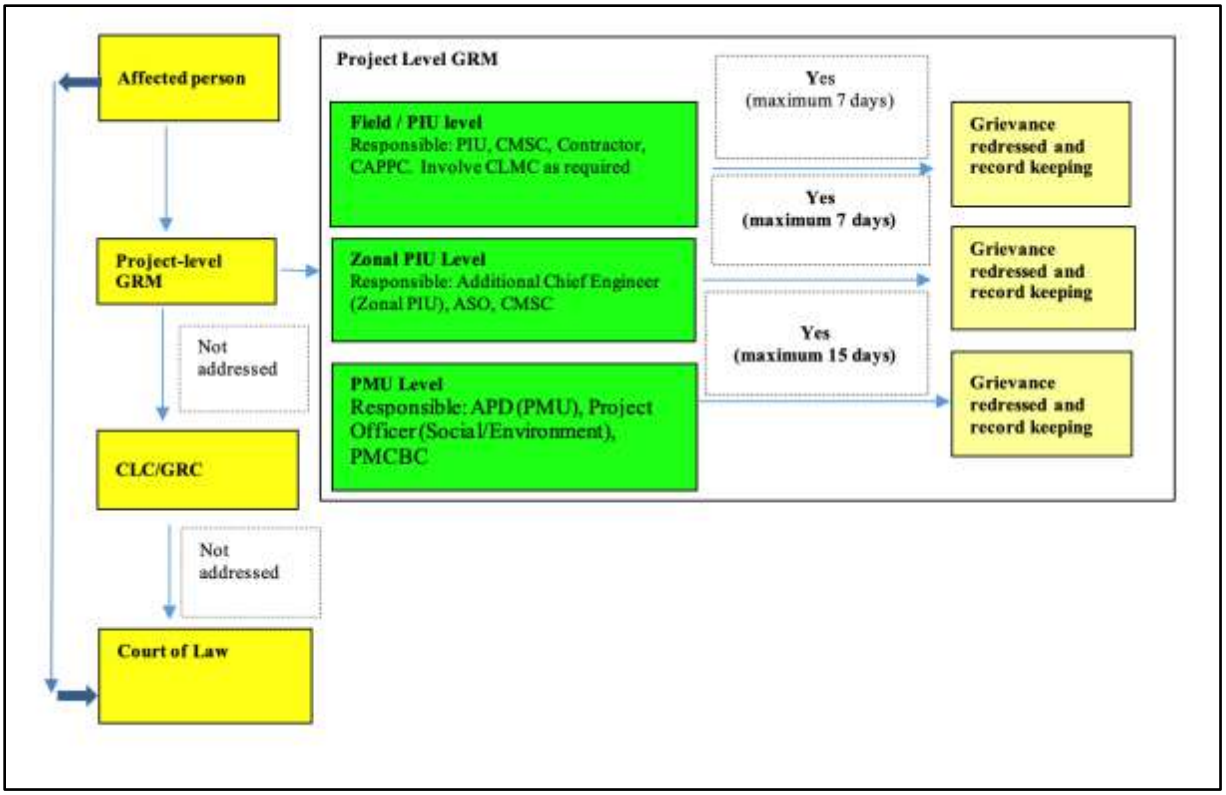
[26] The CLMC has been formed at the town/city level for planning and monitoring of work, resolve issues related to departmental coordination etc. It is headed by Commissioner/Executive Officer ULB (Chairman) and city engineer of public health engineering department (PHED), public works department (PWD) and head of PIU acting as Member Secretary.

[27] City Level Committee (CLC)/grievance redress committees (GRCs) has been constituted for each town/city under the Chairmanship of District Collector to provide overall subproject guidance and "to sort out issues and remove hindrances, if any". CLC formed at city-level/district level with members composed of: District Collector as

the CLC will meet whenever there is an urgent, pending grievance. Other grievances can be discussed during its regular meetings. Zonal PIU will inform the CLC regarding any grievances required to be resolved urgently. The GRC will resolve the grievance within 15 days of receiving the complaint. In case of any indigenous peoples impacts in subprojects, the CLC/GRC must have representation of the affected indigenous people community, the chief of the tribe or a member of the tribal council as traditional arbitrator (to ensure that traditional grievance redress systems are integrated) and an NGO working with indigenous people groups.

(v) The multi-tier GRM for the project is outlined below (**Figure 15**), each tier having time-bound schedules and with responsible persons identified to address grievances and seek appropriate persons' advice at each stage, as required. The GRC will continue to function throughout the project duration.

Figure 15: Grievance Redress Process



APD = Additional Project Director, ASO = Assistant Safeguards Officer, CAPPC = community awareness and public participation consultant, CMSC = construction management and supervision consultants, CLC = city level committee, CLMC = city level monitoring committee, GRC = grievance redress committee, PIU = project implementation unit, PMU = program management unit, PMCBC = project management and capacity building consultant.

Chairperson and following as members: ULB Commissioner/Mayor/Chairman; Deputy Mayor/Vice Chairman ULB; Chairman/Secretary Urban Improvement Trust (UIT); Head of Zonal/field level PIU as Member Secretary; one representative each from relevant government departments as appropriate (PWD/PHED/Town Planning Department etc.). All CLCs in their role as GRCs will have at least one-woman member/chairperson. In addition, for project-related grievances, representatives of affected persons, community-based organizations (CBOs), and eminent citizens will be invited as observers in GRC meetings. The concerned Member of Parliament (MP) and Member of Legislative Assembly are also part of the CLC.

15. The project GRM notwithstanding, an aggrieved person shall have access to the country's legal system at any stage and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM. In case of grievance related to land acquisition, resettlement and rehabilitation, the affected persons will have to approach a legal body/court specially proposed under the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act (RFCTLARRA), 2013.[28]

16. People who are, or may in the future be, adversely affected by the project may submit complaints to ADB's Accountability Mechanism. The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, affected people should make an effort in good faith to solve their problems by working with the concerned ADB operations department. Only after doing that, and if they are still dissatisfied, should they approach the Accountability Mechanism[29].

17. **Record-keeping.** The PIU of each town and PMU will both keep records of grievances received, including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions and the date these were affected and final outcome. The number of grievances recorded and resolved and the outcomes will be displayed/disclosed in the PMU office, PIU offices, and on the web, as well as reported in monitoring reports submitted to ADB on a semi-annual basis.

18. **Periodic review and documentation of lessons learned.** The PMU Project Officer (Environment) will periodically review the functioning of the GRM in each town and record information on the effectiveness of the mechanism, especially on the project's ability to prevent and address grievances.

19. **Costs.** Contractors are required to allocated budget for pamphlets and billboards as part of the EMP. Costs involved in resolving the complaints (meetings, consultations, communication and reporting/information dissemination) will be borne by the concerned PIU at town level while costs related to escalated grievances will be met by the PMU. Cost estimates for grievance redress are included in resettlement cost estimates.

20. Presently GRC in 14 ongoing project towns are functional as per RSTDSP's Grievance Redress Mechanism (GRM). Therefore 2nd and 3rd level GRC are already functional at Zonal PIUs (at Jaipur and Jodhpur) and PMU levels. PIU level GRC shall be formed in upcoming project towns after PIUs in new towns are established through office order from PMU for the same.

IX. ENVIRONMENTAL MANAGEMENT PLAN

A. Environmental Management Plan

21. The purpose of the environmental management plan (EMP) is to ensure that the activities are undertaken in a responsible, non-detrimental manner with the objectives of: (i)providing a proactive, feasible, and practical working tool to enable the measurement and monitoring of

[28]The Authority admits grievance only with reference to the Land Acquisition and R&R issues under the RFCTLARRA, 2013.

[29] Accountability Mechanism. http://www.adb.org/Accountability-Mechanism/default.asp

environmental performance on-site; (ii) guiding and controlling the implementation of findings and recommendations of the environmental assessment conducted for the project;(iii) detailing specific actions deemed necessary to assist in mitigating the environmental impact of the project; and (iv) ensuring that safety recommendations are complied with.

22. A copy of the EMP must be kept at work sites at all times. This EMP will be included in the bid documents and will be further reviewed and updated during implementation. The EMP will be made binding on all contractors operating on the site and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

23. For civil works, the contractor will be required to (i) establish an operational system for managing environmental impacts (ii) carry out all of the monitoring and mitigation measures set forth in the EMP; and (iii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer will prepare from time to time to monitor implementation of this IEE and EMP. The contractor shall allocate budget for compliance with these EMP measures, requirements and actions. EMP for various stages is given in **Tables 23** below.

Table 23: Design Stage Environmental Management Plan

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation/ Monitoring	Cost and Source of Funds
CWRs	Hazardous / harmful chemicals	(i) Reduce the use of chemicals in the treatment process to the extent possible (water treatment); provide non-chemical alternatives or easily recoverable and/or reusable chemicals or biocompatible alternatives. (ii) Establish proper handling / storage / application system according to the relevant standards, safety precautions and prevent accidental release / spill (iii) Provide leak/spill detection, collection / capture and safe disposal facilities such as chlorine absorption and neutralization facility (iv) Provide ventilation, lighting, entry and exit facilities; visible & audible alarm facilities to alert chemical/chlorine leak (v) Facility for isolation in the event of major leakages (vi) Eye wash & shower facility (vii) Personal protection and safety equipment for the operators (masks, oxygen cylinders, gloves, etc.,) (viii) Provide training to the staff in safe handling and application of chemicals, material safety, and standard operating procedures and emergency responses (ix) Develop emergency response procedures	DBO Contractor/PIU	Project costs
Design of Sewage Treatment Plant	Mixing of industrial effluent with sewage	No industrial wastewater shall be allowed to dispose into municipal sewers No domestic wastewater from industrial units shall be allowed into municipal sewers (i) Ensure that there is no illegal discharge through manholes or inspection chambers (ii) Conduct public awareness programs; in coordination with RSPCB, issue notice to all industries for compliance (iii) Conduct regular wastewater quality monitoring (at inlet and at outlet of STP) to ensure that the treated effluent quality complies with the standards		
Sewer network – collection & conveyance	Poor design leading to overflows, blockages, and creating nuisance, pollution	(i) Limit the sewer depth where possible (ii) Sewers shall be laid away from water supply lines and drains (at least 1 m, wherever possible);	DBO Contractor / PIU	Project costs

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation/ Monitoring	Cost and Source of Funds
		(iii) In all cases, the sewer line should be laid deeper than the water pipeline (the difference between top of the sewer and bottom of water pipeline should be at least 300 mm) (iv) In unavoidable, where sewers are to be laid close to storm water drains, appropriate pipe material shall be selected (stoneware pipes shall be avoided) (v) For shallower sewers and especially in narrow roads, use small inspection chambers in lieu of manholes; (vi) Design manhole covers to withstand anticipated loads & ensure that the covers can be readily replaced if broken to minimize silt/garbage entry (vii) Ensure sufficient hydraulic capacity to accommodate peak flows and adequate slope and gas vents in gravity mains to prevent buildup of solids and hydrogen sulfide generation (viii) Take necessary precautionary measures to protect sewer network, and to avoid disposal of solid wastes, debris, wastewater into newly laid sewers from the time it is constructed to the start of operation phase		
FSSM	Occupational health and safety issues, and impact on STP process	(i) Conduct detailed survey of the households to be covered with FSSM to design the system to suit the local conditions, such as type of septic tanks and their location in the houses (ii) Create awareness program on the FSSM from collection to treatment system that will be adopted (iii) Design the sewage treatment process duly considering mixing of septage (iv) Ensure that the FSSM system is completely mechanized no human touch, even accidentally, from collection at household to discharge into STP, and in periodic cleaning of tankers (v) Demarcate a proper area for cleaning of mobile tankers in STP premises, and ensure that the wastewater shall be discharged into STP (vi) Provide proper training to the workers, and staff in safe handling of FSSM tasks, provide all necessary personal protection equipment	DBO Contractor / PIU	Project costs

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation/ Monitoring	Cost and Source of Funds
		(vii) Ensure proper facilities for workers including showers, wash areas, toilets, drinking water, eating and resting places (viii) Conduct regular health checks (ix) Prepare Health and Safety Plan for FSSM		
Asbestos cement (AC) pipes in existing water supply system: clearing, transfer and disposal; work in narrow streets, and interventions in existing AC pipelines	Health impacts due to air borne asbestos if handled unsafely, cut, drilled or broken into pieces	(i) Develop ACM Management Plan (AMP) that includes identification of hazards, the use of proper safety gear and disposal methods. Sample AMP is provided in Appendix C-20. Adhere to the workflow process suggested in IEE (ii) Conduct awareness program on safety during the construction work (iii) Undertake the construction work stretch-wise; excavation, pipe laying and trench refilling should be completed on the same day (iv) Provide barricades, and deploy security personnel to ensure safe movement of people and also to prevent unnecessary entry and to avoid accidental fall into open trenches (v) Identify risk of intervention with existing AC pipes. If there is significant risk, implement the AMP strictly that includes identification of hazards, the use of proper safety gear and disposal methods. (vii) Maintain records of AC pipes as per the AMP (viii) Refer to the instructions of the Asbestos Expert	DBO Contractor/PMU	Project costs
Asbestos materials in existing PHED campus	Health impacts due to air borne asbestos if handled unsafely, cut, drilled or broken into pieces	(i) Conduct survey and inventory of existing asbestos materials on site (ii) Conduct risk assessment to determine extent of asbestos materials currently on-site (ii) Coordinate and provide support to the asbestos management service provider on the requirement of sampling, testing and disposing existing asbestos materials (iii) Ensure the selected area for temporary storage is suitable for safe storage of asbestos materials (iv) Incorporate international and national standards considered in designing the temporary storage (v) Ensure that handling and disposal of asbestos materials are carried out by specially trained service provider/s following Government of India requirements, or in their	DBO Contractor/PMU	Project costs

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation/ Monitoring	Cost and Source of Funds
		absence, internationally recognized procedures Refer to the requirements of the Asbestos Management Plan and instructions of the Asbestos Expert		
Location impacts of proposed components	Nearby community may be affected due to increased pollution during construction and operation	(i) sites should be selected so that nearby community may have no or minimum impact due to proposed works (ii) Mitigation measures are prepared and included in design and EMP is attached with contract documents	Consultants/PMU	No cost required
Requirement of tree cutting	Tree cutting may result loss of aesthetics and increase in air pollution	(i) sites should be selected so that minimum tree cutting is required (ii) project documents should include the minimum tree cutting provisions (iii) Provision for Compensatory plantations should be included in contract documents	Consultants/PIU/PMU	No cost required
Energy Efficiency	Loss of natural resources	(i) Use energy efficient electrical equipment. (ii) Provision of use of energy efficient equipment in contract agreements and BOQ	Consultants/PMU	No cost required
Incorporating EMP and Health and Safety requirements into Contractor Bid Document	Implementation of the EMP	The EMP should be included in the Bid Document so that the selected Contractor understands the issues and makes necessary plans to prepare and implement the EMP	PMU	Project Costs
	Implementation of the Health and Safety measures by contractor	Health and safety requirements should be incorporated as part of the contract bid document so that the selected Contractor understands the issues and makes necessary plans to prepare and implement the health and safety requirements.	PMU	Project Costs
Preparation of plans and protocols	Various impacts	(i) Preparation of ACM Management Plan (ii) Prepare traffic management plan (iii) Prepare occupational health and safety plan (iv) Prepare spoils management plan	DBO Contractor and CMSC with the assistance of PMCBC (for ACM plan)	Project costs

Table 24: Environmental Management Plan of Anticipated Impacts during Pre-Construction

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
Compliance with environmental	Environmental impacts due to subproject	Compliance with environmental	Consents, permits, clearance, NOCs, etc.	PIU and Balotra Nagar Parishad	PMU	No costs required

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
subproject selection criteria		subproject selection criteria A compliance checklist is appended to this report (**Appendix 2**)	A compliance checklist is appended to this report (**Appendix 2)**			
Environmental monitoring of baseline conditions of air, noise, water and soil	To establish base line environmental conditions	Environmental monitoring through NABL approved laboratory	Environmental Monitoring Report of Air, noise, soil and water quality	Construction contractor	Consultants/PIU	Contractor
Utilities	Telephone lines, electric poles and wires, water lines and gas pipelines within proposed project area	Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase; and (ii) Require construction contractors to prepare a contingency plan to include actions to be taken in case of unintentional interruption of services. (iii) Require contractors to prepare spoils management plan	-List and maps showing utilities to be shifted -Contingency plan for services disruption	Contractor in collaboration with PIU and with approval of PMU	CMSC/ PIU	No cost required. Mitigation measures are part of TOR of PMU, PIU and Consultants

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		(**Appendix** C-13) and traffic management plan (**Appendix** C-14)				
Construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.	Disruption to traffic flow and sensitive receptors	Prioritize areas within or nearest possible vacant space in the project location; If it is deemed necessary to locate elsewhere, consider sites that will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems; Do not consider residential areas; Written consent of landowner/s (not lessee/s) for reuse of excess spoils to agricultural land Take extreme care in selecting sites to avoid direct disposal to water body which will inconvenience the community. (v) For excess spoil disposal, Contractor will prioritize the use	-List of pre-approved sites for construction work camps, areas for stockpile, storage and disposal -Waste management plan	Contractor to finalize locations in consultation and approval of PIU	CMSC/ PIU	No cost required. Mitigation measures are part of TOR of PIU and Consultants and also part of contractual terms

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		of solid/construction waste disposal sites operated under the consent from RSPCB. If unavailable or not feasible, contractor contractor shall identify disposal site confirming to the following criteria, obtain required permissions from local body, and submit for the approval of PIU; disposal sites shall be used only after approval of the PIU: (a) site shall be selected preferably from barren, infertile lands. In case agricultural land needs to be selected, written consent from landowners (not lessees) will be obtained; (b) debris disposal site shall be at least 200 m away from surface water bodies; (c) no residential areas shall be located within 50 m downwind side of the				

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		site; and (d) site is minimum 250 m away from sensitive locations like settlements, ponds/lakes or other water bodies.				
Sources of Materials	Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.	Prioritize sites already permitted by the Department of Mines and Geology If other sites are necessary, inform construction contractor that it is their responsibility to verify the suitability of all material sources and to obtain the approval of PMU and If additional quarries will be required after construction is started, inform construction contractor to obtain a written approval from PIU. Bid document to include requirement for verification of suitability of sources and permit for additional quarry sites if necessary.	Permits issued to quarries/sources of materials	Contractor to prepare list of approved quarry sites and sources of materials with the approval of PIU	CMSC/ PIU	No cost required. Mitigation measures are part of TOR of PIU and Consultants and also part of contractual terms

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
Consents, permits, clearances, NOCs, etc.	Failure to obtain necessary consents, permits, NOCs, etc. can result to design revisions and/or stoppage of works	Obtain all necessary consents (including CTE for STP from RSPCB), permits, clearance, NOCs, etc. prior to award of civil works. (iFollowing consents are required- Tree cutting- local authority Storage, handling and transport of hazardous materials- RSPCB Sand mining, quarries, borrow areas- Department of mines and Geology Traffic diversion/road cutting- local authority, traffic police Ensure that all necessary approvals for construction to be obtained by contractor are in place before start of construction Acknowledge in writing and provide report on compliance all obtained consents,	Consents, permits, clearance, NOCs, etc.	PIU and Consultants	CMSC/ PIU	No cost required. Cost of obtaining all consents, permits, clearance, NOCs, etc. prior to start of civil works responsibility of PIU. Mitigation measures are part of TOR of PIU and Consultants

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		permits, clearance, NOCs, etc. Include in detailed design drawings and documents all conditions and provisions if necessary				

Table 25: Environmental Management Plan of Anticipated Impacts during Construction

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
EMP Implementation Training	Irreversible impact to the environment, workers, and community	(i) Project manager and all key workers will be required to undergo EMP implementation including spoils management, Standard operating procedures (SOP) for construction works; occupational health and safety (OH&S), core labor laws, applicable environmental laws, etc. (ii) Contractor has to depute a qualified EHS personnel in the start of the project to conduct training to all the personnel and effective monitoring of mitigation measures during construction	Training Plan and its implementation Achievement of the environmental performance targets by the Contractor;	Construction Contractor	CMSC/ PIU	Cost of EMP Implementation Orientation Training to contractor is responsibility of PMU. Other costs responsibility of contractor.
Air Quality	Emissions from construction vehicles, equipment, and machinery used for installation of pipelines	(i) Consult with PIU on the designated areas for stockpiling of clay, soils, gravel, and other construction materials; (iii) Damp down exposed soil and any stockpiled material on site by water sprinkling necessary during dry weather;	-Visual inspection -No complaints from sensitive receptors -Records -PUC certificates - CTE and CTO;	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	resulting to dusts and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulphur oxides, particulate matter, nitrous oxides, and hydrocarbons.	(iv) Use tarpaulins to cover sand and other loose material when transported by trucks; and (v) Fit all heavy equipment and machinery with air pollution control devices which are operating correctly. (vi) Quarterly environmental monitoring for ambient air as per EMP	-Periodic Air Quality Monitoring;			
Water quality	Mobilization of settled silt materials, and chemical contamination from fuels and lubricants during installation of pipelines can contaminate nearby surface water quality.	(i) Prepare and implement a spoils management plan (**Appendix** C-14**)** (ii) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets; (ii) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies; (iii) Place storage areas for fuels and lubricants away from any drainage leading to water bodies; (iv) Dispose any wastes generated by work in designated sites; and (v) Conduct surface quality Monitoring according to the Environmental Management Plan (EMP).	Areas for stockpiles, storage of fuels and lubricants and waste materials; -Number of silt traps installed along trenches leading to water bodies; -Records of surface water quality Monitoring; -Effectiveness of water management measures;	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
			-No visible degradation to nearby drainages, nallahs or waterbodies due to civil works			
Noise Levels	Increase in noise level due to earth-moving and excavation equipment, and the transportation of equipment, materials, and people	(i) Plan activities in consultation with PIU/Consultants so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance; (ii) Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach; (iii) Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and portable street barriers the sound impact to surrounding sensitive receptor; and (iv) Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at a distance of 10 m or more from the vehicle/s. (v) Quarterly environmental monitoring for ambient noise as per EMP	-Complaints from sensitive receptors; -Use of silencers in noise-producing equipment and sound barriers; -Equivalent day and night time noise levels (see **Appendix** C-18 of this IEE)	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Ground Water Quality	Contamination of ground water quality due to spillage of oil and lubricants	Prepare and implement a spills management plan; Provide impermeable liner on the ground and place layer of mortar or concrete over it in the oil and lubricants storage areas, provide spillage trap in oil and lubricant store,	-CTO and CTE compliance; -Periodic GW Quality Monitoring Reports;	Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		use dip tray and pump to pour oil from oil and lubricant drums; Dispose any oil contaminated wastes generated by construction activities in scientific manner; and Conduct ground water quality monitoring according to the EMP	-Areas for storage of fuels and lubricants and waste materials; - Number of oil traps installed in oil and lubricant storage areas; ;			
Landscape and aesthetics	Impacts due to excess excavated earth, excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers, spoils, oils, lubricants, and other similar items.	(i) Prepare and implement spoils management plan (**Appendix** C-13); (ii) Avoid stockpiling of excess excavated soils; (iii) Coordinate with ULB/PIU for beneficial uses of excess excavated soils or immediately dispose to designated areas; (iv) Recover used oil and lubricants and reuse or remove from the sites; (v) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas; (vi) Remove all wreckage, rubbish, or temporary structures which are no longer required; and (vii) Request PIU to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.	(i) Complaints from sensitive receptors; (ii) Worksite clear of hazardous wastes such as oil/fuel (iiv) Worksite clear of any excess excavated earth, excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Existing Infrastructure and Facilities	Disruption of service and damage to existing infrastructure	(i) Obtain from PIU the list of affected utilities and operators if any; (ii) Prepare a contingency plan to include actions to be done in case of unintentional interruption of service	As per contingency plan	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	at specified project location	(iii) inform nearby community in advance about the nature and timings of disturbance				responsibility of contractor.
Ecological Resources – Terrestrial	Loss of vegetation and tree cover	(i) Minimize removal of vegetation and disallow cutting of trees; (ii) If tree-removal will be required, obtain tree-cutting permit from the Revenue Department; and (iii) Plant three native trees for every one that is removed.	-Records -Plant native tree species as per RUDSICO-EAP Policy	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Land use	Environmental Issues due to land use change	The impact due to change in land use will be negligible due to this project.	-Latest land use records	Not applicable	PMU/ ULB	Not applicable
Accessibility	Traffic problems and conflicts near project locations and haul road	(i) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites; (ii) Schedule transport and hauling activities during non-peak hours; (iii) Locate entry and exit points in areas where there is low potential for traffic congestion; (iv) Keep the site free from all unnecessary obstructions; (v) Drive vehicles in a considerate manner; (vi) Coordinate with Traffic Police for temporary road diversions and with for provision of traffic aids if transportation activities cannot be avoided during peak hours; (vii) Notify affected sensitive receptors 1-week in advance by providing sign boards informing nature and duration of construction	(i) Traffic route during construction works including number of permanent signages, barricades and flagmen on worksite (**Appendix** C-14); (ii) Complaints from sensitive receptors; (iii) Number of signages placed at project location.	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		works and contact numbers for concerns/complaints. (viii) Plan and execute the work in such a way that the period of disturbance/ loss of access are minimum. (ix) Provide pedestrian access in all the locations until normalcy is restored.				
Socio-Economic – Income.	Impede the access of residents and customers to nearby shops	(i) Prepare and implement spoils management plan (**Appendix** C-13). Contractor to Implement RP and to follow mitigation measures prescribed such as- (ii) Leave spaces for access between mounds of soil; (ii) Provide walkways and metal sheets where required for people. (iii) Increase workforce in front of critical areas such as institutions, place of worship, business establishment, hospitals, and schools; (iv) Consult businesses and institutions regarding operating hours and factoring this in work schedules; and (v) Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.	(i) Complaints from sensitive receptors; (ii) Spoils management plan (iii) Number of walkways, signages, and metal sheets placed at project location.	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Socio-Economic - Employment	Generation of temporary employment and increase	(i) Employ at least 50% of the labour force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available;	(i) Employment records;	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	in local revenue	(ii) Secure construction materials from local market. (iii) Comply with labor laws	(ii) Records of sources of materials (iii) Compliance to labor laws (see **Appendix** C-12 of this IEE)			responsibility of contractor.
Replacing the old sewer lines/ connection of new sewer in old sewers.	Toxic gases from sewer, Higher tempration, chances of infection	I. No entering into sewer shall be allowed II. Keep all PPEs ready all the time. III. Using gas masks while working very close to the pumping main line; IV. Testing manhole rungs or steps for structural safety before using; V. Lowering all the tools to the workman in bucket and ensuring that no tools are located near the manhole edge that could fall in to the manhole; VI. VII. Using lighting equipment that are explosion and fire proof; III. Adequate and easily readable warning signs to the traffic well ahead of the work area; IX. Posting flagman at the two ends of the working pumping main line to avoid traffic jams; X. Avoiding infections by using rubber gloves, gum boots, separate cloths while working; and XI. By keeping records of injury with description of accident, corrective actions taken and the accident analysis. In addition to the above, an up-to-date record of maps and	-Visual inspection -Records -Work schedule -Visible first aid equipment and medical supplies -Condition in H&S plan -Area secured -Trenches barricaded -Supply of water -Visible and understandable sign boards in construction zone -H&S plan including appropriate signs for each hazard present -Construction vehicles condition in H&S plan.	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		profiles have to be maintained duly incorporating any changes made, if any, during construction and repair works. This will help in proper maintenance of the system. XII. Develop and implement site-specific Health and Safety (H&S) Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use Personal Protective Equipment (PPE); (c) H&S Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work related accidents				
Occupational Health and Safety	Occupational hazards which can arise during work	(A) Comply with all national, state and local core labor laws (see **Appendix** C-12of this IEE) (B) Ensure that qualified EHS personnel is deputed to look the H&S matter (i) Develop and implement site-specific occupational health and safety (OH&S) Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use personal protective equipment like helmet, gumboot, safety belt, gloves, nose musk and ear plugs; (c) OH&S Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e)	(i) Site-specific OH&S Plan; (ii) Equipped first-aid stations; (iii) Medical insurance coverage for workers; (iv) Number of accidents; (v) Supplies of potable drinking water; (vi) Clean eating areas where workers are not exposed to hazardous or	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		documentation of work-related accidents; (ii) Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site; (iii) Provide medical insurance coverage for workers; (iv) Secure all installations from unauthorized intrusion and accident risks; (v) The project area experiences extreme temperature during summer months of April and May, which may affect the health of workers engaged in construction work. Contractor should take necessary measures during summers including the following: (a) work schedule should be adjusted to avoid peak temperature hours (12 – 3 PM); (b) provide appropriate shade near the work place; allow periodic resting and provide adequate water, and (c) provide necessary medicine and facilities to take care of dehydration related health issues (v) Provide supplies of potable drinking water; (vi) Provide clean eating areas where workers are not exposed to hazardous or noxious substances; (vii) Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective	noxious substances; (vii) record of H&S orientation trainings (viii) personal protective equipment; (ix) % of moving equipmentoutfitted with audible back-up alarms; (xi) permanent sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. (xii) Compliance to core labor laws (see **Appendix** C-12 of this IEE)			

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		protection, and preventing injuring to fellow workers; (viii) Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted; (ix) Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; (x) Ensure moving equipment is outfitted with audible back-up alarms; (xi) Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and (xii) Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively. (xiii) Provide proper solid and liquid waste management program in workers' campsite, separate from spoils and debris disposal, as their				

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		presence can add to existing waste volume at the project sites.				
Community Health and Safety.	Traffic accidents and vehicle collision with pedestrians during material and waste transportation	(i) Plan routes to avoid times of peak-pedestrian activities. (ii) Liaise with PIU/ULB in identifying high-risk areas on route cards/maps. (iii) Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure. (iv) Provide road signs and flag persons to warn of on-going trenching activities.	As per Traffic Management Plan given in **Appendix** C-14.	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Safety of sensitive groups (children, elders etc.) and others pedestrians in narrow streets	Trench excavation in in narrow streets will pose high risk to children and elders in the locality	(i) Provide prior information to the local people about the nature and duration of work (ii) Conduct awareness program on safety during the construction work (iii) Undertake the construction work stretch-wise; excavation, pipe laying and trench refilling should be completed on the same day (iv) Provide barricades, and deploy security personnel to ensure safe movement of people and also to prevent unnecessary entry and to avoid accidental fall into open trenches	-H&S plan including appropriate signs for each hazard present -Construction vehicles condition in H&S plan. Complaints from neighborhood and monitoring of accidents	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Work Camps and work sites	Temporary air and noise pollution from machine operation, water pollution from storage and	(i) Consult with PIU before locating project offices, sheds, and construction plants; (ii) Minimize removal of vegetation and disallow cutting of trees; (iii) Provide drinking water, water for other uses, and sanitation facilities for employees;	-Condition in list of preapproved sites for construction work camps, areas for stockpile,	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	use of fuels, oils, solvents, and lubricants Unsanitary and poor living conditions for workers	(iv) Ensure conditions of livability at work camps are maintained at the highest standards possible at all times; (v) Train employees in the storage and handling of materials which can potentially cause soil contamination; (vi) Recover used oil and lubricants and reuse or remove from the site; (vii) Manage solid waste according to the preference hierarchy: reuse, recycling and disposal to designated areas; (viii) Ensure unauthorized persons especially children are not allowed in any worksite at any given time.	storage and disposal prepared by the Contractor. Drinking water and sanitation facilities for employees			
Impacts due to night works (if required as per nature of works and feasibility at site)	Occupational hazards which can arise during work at night in extreme and unavoidable cases	(i) Contractors should have hand held noise level meter for measurement of noise during night hours (ii) Contractors should have hand held lux meter for the measurement of illumination during night hours (iii) Preferably electrical connections is available for running equipments otherwise sound proof/super silent Diesel Generator set should be available (iv) Sound level should not increase as per EMP (v) Illumination should be adequate as required according to nature of works (vi) As far as possible ready mix concrete from batching plant to be used, otherwise the concrete should be prepared away from residential	As per Management Plan for night works (**Appendix** C-18).	Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		areas and brought to the site (vii) All the noise activity like hammering, cutting, crushing, running of heavy equipments should be done in day time and avoided in night time (viii) Workers engaged in night works should have adequate rest/sleep in day time before start of night works (ix) Worker engaged for night works should have previous experience of night works and should be physically fit for such works including clear vision in night (x) All the necessary provisions of traffic aids such as traffic signals, road signage, barricades, cautions boards, traffic diversion boards etc. should be available with fluorescent/retro-reflective arrangements (xi) Workers should be trained before start of night works about risks and hazards of night works and their mitigation measures and should be provided all the protective aids (PPEs) including fluorescent/retro-reflective vests (xii) Horns should not be permitted by equipments and vehicles (xiii) Workers should not shout and create noise (xiv) First aid and emergency vehicles should be available at site (xv) Emergency preparedness plan should be operative during night				

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		works (xvi) Old persons and pregnant women and women having small kids should not work in night time (xvii) All the vehicles and equipments being used at night works should have adequate type of silencers/enclosures/mufflers to reduce noise (xviii) All the vehicles should be checked for working head lamps, tail lamps, inner lights etc. before start of night works				
Physical Cultural resource	Encroachment/ damage to protected monuments and chance finds	(i) Create awareness among the workers, supervisors and engineers about the chance finds during excavation work; (ii) Stop work immediately to allow further investigation if any finds are suspected; (iii) Inform archeology department /Museum office if a find is suspected and take any action, they require to ensure its removal or protection in situ; and prepare a chance find protocol	Chance find protocol	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Social and Cultural Resources	Risk of archaeological chance finds	(i) Consult with concerned religious authorities, nearby people and devotees in pre-construction phase and explain the work method and duration of proposed works, take their suggestions and comments and incorporate in design the mitigation measures required (ii) Adjacent to religious/social sites, undertake excavation and	Chance find protocol	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		construction work in such a way that no structural damage is caused to the religious building. (iii) Observe the local rituals and important dates of festivals, weekly/monthly/annual religious occasions in the religious places and do not make any disturbance/hindrance/obstacles during such time to the religious places, (iv) provide proper signage, barricades etc. to protect public and devotees from dangers of construction works.				
Monsoon preparedness	Disruption of utilities and water logging in trenches	(i) As for a possible avoid trench works and excavation works (pipe laying) during monsoon season to avoid any water logging and accident due to it (ii) if open trenches are not avoidable during monsoon, keep ready all the mitigations measures to avoid water logging such as dewatering pumps and sufficient pipes, traffic assistance, barricades etc. (iii) Guidelines for safety during monsoon is attached as **Appendix** C-19	As per monsoon preparedness plan& as per **Appendix** C-19 "Guidelines for Safety during Monsoon/Heavy Rainfall"	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Submission of EMP implementation report	Unsatisfactory compliance to EMP	(i) Appointment of supervisor to ensure EMP implementation (ii) Timely submission of monitoring reports including pictures	Availability and competency of appointed supervisor Monthly report	Construction contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
COVID-19 prevention and control during construction works	Health risk to workers due to COVID-19 virus	(i) provide face mask, hand gloves and sanitizers to workers during works (ii) Keep social distancing (iii) Educate workers about risks of COVID-19 (iv) Health check-up of workers suffering with symptoms of COVID-19 and test for same (v) isolation of workers suspected/suffering with COVID-19 and due medical care (vi) follow guidelines of WHO/Central/State/Local government and RUDSICO-EAP regarding COVID-19 (refer **Appendix** C-23)	Compliance of COVID-19 protocol and guidelines	Construction contractor	PIU/Consultants	Contractor
Post-construction clean-up	Damage due to debris, spoils, excess construction materials	(i) Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and (ii) All excavated roads shall be reinstated to original condition. (iii) All disrupted utilities restored (iv) All affected structures rehabilitated/compensated (v) The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these shall be cleaned up. (vi) All hardened surfaces within the construction camp area shall be ripped, all imported materials removed, and the area shall be top soiled and regrassed using the	PIU/Consultant report in writing that (i)worksite is restored to original conditions; (ii)camp has been vacated and restored to pre-project conditions; (iii)All construction related structures not relevant to O&M are removed; and (iv) worksite	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		guidelines set out in the revegetation specification that forms part of this document. (vii) The contractor must arrange the cancellation of all temporary services. (viii) Request PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.	clean-up is satisfactory.			

Table 26: Environmental Management Plan of Anticipated Impacts during Operation

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Construction disturbances, nuisances, public & worker safety	All work sites	Implementation of dust control, noise control, traffic management, & safety measures. Site inspection checklist to review implementation is appended at **Appendix** C-16	All the dust control will be done by water sprinkling measures at site, noise will be kept well within prescribed limits of standards, Follow Traffic management Plan as given in **Appendix** C-14and all the safety measures such as PPE's etc. Site inspection will be done as per checklist is given in **Appendix** C-16	Weekly during construction	Supervising staff and safeguards specialists	No costs required
Check the leakages blockages, overflow problem in sewers	It may affect the sewer system, contaminate land, water and create public health issues	Effective operation to avoid and/or immediate clearance of such leaks, blockages Implementation of regular O&M schedules	Follows regular O & M schedule	Balotra Nagar Parishad /O&M contractor	Balotra Nagar Parishad	DBO contractor cost O&M Cost

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Check the leakages blockages, overflow problem in sewers	Occupational health & safety: for personnel cleaning underground sewers there is a risk due to oxygen deficiency and harmful gaseous emissions (hydrogen sulphide, carbon monoxide, methane, etc.);	(i)Provide necessary health & safety training to the staff engaged sewer cleaning & maintenance (ii) provide appropriate personal protection equipment (including oxygen masks)	-Training and Awareness campaign for Occupational, Health& Safety to ensure the use of PPE's.	Balotra Nagar Parishad /O&M Contractor	Balotra Nagar Parishad	O&M Cost
Consent to Operate	Periodical renewal of consent to operate, if not done, may attract penal action from State Pollution Control Board	Renew the consent to operate (CTO) of STP before expiry date and follow all the conditions set forth in CTO	RSPCB	Balotra Nagar Parishad /PHED/O&M Contractor	Balotra Nagar Parishad /PHED/O&M Contractor	Balotra Nagar Parishad /PHED/O&M Contractor
Treated effluent quality	Water pollution of the receiving body if treated effluent does not meet the standards set by CPCB/RSPCB	Regular monitoring (parameters tests) of treated effluent quality Follow all the parameters given in CTE/CTO	Test results records	Balotra Nagar Parishad /O&M Contractor	Balotra Nagar Parishad /O&M Contractor	Balotra Nagar Parishad /O&M Contractor
Reuse of Treated effluent/safe disposal	Adverse impact on water hydrology and crops	Prepare a plan of reuse of treated effluent in agriculture or other gainful purposes	Records on treated water reuse	Balotra Nagar Parishad /O&M Contractor	Balotra Nagar Parishad /O&M Contractor	Balotra Nagar Parishad /O&M Contractor
Achieving targeted sludge reuse	Violation of ULB commitment under the project. Moreover, o land has been identified for safe sludge disposal. Hence, it is imperative to achieve the targeted sludge reuse under the project.	Ensure that the targeted sludge reuse is achieved throughout the project period	Records	Balotra Nagar Parishad /O&M Contractor	Balotra Nagar Parishad /O&M Contractor	Balotra Nagar Parishad /O&M Contractor
Safety precautions during sewage manhole cleaning	Health and safety risk to workers engaged in sewage manhole cleaning	Ensure all the safety equipment are available during manual cleaning As for as possible, use CCTV and mechanical cleaning (sewage jetting machine) for cleaning of manhole	-Training and Awareness campaign for Occupational, Health& Safety to ensure the use of PPE's.	O&M contractor for 10 years and then Balotra Nagar Parishad	Balotra Nagar Parishad	Balotra Nagar Parishad

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Routine maintenance of CWR and other facilities to ensure delivery of safe drinking water	Health impact due to supply of unsafe drinking water in the system	Ensure periodical maintenance and cleaning of OHSRs, CWRs to ensure delivery of safe drinking water Periodical testing of treated water to ensure treated water quality meets the required standards	Maintenance Records	O&M contractor for 10 years and then PHED, Balotra.	PHED, Balotra	O&M cost of contractor
Leakages in water supply pipe lines	Entry of waste water into water supply pipes and health risk to public due to poor quality water	Ensure to identify and repair leakage immediately Strengthen grievance mechanism and attend the grievance of any leakage	Maintenance Records; Periodic Leakage Report;	O&M contractor for 10 years and then PHED, Balotra.	PHED , Balotra	O&M cost of contractor
Asset management	Reduction in NRW Increased efficiency of the system	Preparation and implementation of O&M Manual	O&M Manual; Implementation Records;	O&M contractor for 10 years and then PHED , Balotra	PHED , Balotra	O&M cost of contractor

Table 27: Environmental Monitoring Plan of ambient air, noise, water and soil quality and other during Construction

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
Construction disturbances, nuisances, public & worker safety	All work sites	Implementation of dust control, noise control, traffic management, & safety measures. Site inspection checklist to review implementation is appended at **Appendix** C-16	Weekly during construction	Supervising staff, EHS officer and safeguards specialists	No costs required
Tree cutting	Net Working of Pipe Laying and Sewerage.	Tree cutting permit taken if Tree cutting is required	Continuous	Supervising staff, EHS officer and safeguards specialists	Contractor
Construction, Labour Camp, storage yard Management	Construction, Labour Camp, storage yard Management	As per SEMP	Weekly	EHS officer, Environment Specialist of consultant	contractor
Solid waste management	Construction, Labour Camp, storage yard Management	As per SEMP	Weekly	EHS officer, Environment Specialist of consultant	contractor
Construction and demolition waste management	All construction site	As per SEMP and applicable rules and regulations	Weekly	EHS officer, Environment Specialist of consultant	contractor
Consent to establish of STP, WTP, batching plants, crusher, hot mix plant. DG sets etc.	STP, WTP batching plants, crusher, hot mix plants etc	Copies of Consents	Periodically	EHS officer, Environment Specialist of consultant	No cost required for monitoring cost for obtaining CTE/CTO from PMU and for others from Contractor
Ambient air quality	2 locations (First is sewer network laying site and second is	PM_{10}, $PM_{2.5}$, NO_2, SO_2, CO	Quarterly except Monsoon period	Contractor	Contractor Contractor

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
	water supply networking laying site)				
Ambient noise	2 locations (First is sewer network laying site and second is water supply networking laying site)Intake-1 during construction)	Day time and night time noise levels	Quarterly	Contractor	Contractor
Surface Water quality	2 locations (First is sewer network laying site and second is water supply networking laying site)	pH, TDS, Total Hardness, Zn, Chloride, Iron, Copper, DO, Manganese, Suplhate, Nitrate, Fluiride, Hg, Cadmium, Cr^{+6}, Arsenic, Lead, Total Alkalinity, Phosphate, Phenolic compound	Quarterly except Monsoon period	Contractor	Contractor

Table 28: Environmental Monitoring Plan of Anticipated Impacts during Operation

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
Monitoring of raw sewage quality	Inlet of the STP	Suspended solids, pH, Temperature Oil and grease, Total residual chlorine, Ammonical nitrogen (as N), BOD, COD, Nitrate Nitrogen The values should be within the limit specified by CPCB to discharge into municipal sewers (see **Appendix** C-8)	As per O&M Plan	O&M Contractor/Nagar Parishad	O&M Contractor/ Nagar Parishad
Monitoring of treated effluent quality	Outlet of STP	pH, BOD, COD, TSS, NH_4-N, N-total, Fecal Coliform (as per **Appendix** C-8)	As per O&M Plan	O&M Contractor/Nagar Parishad	O&M Contractor/ Nagar Parishad
Monitoring of plantations	Plantations locations	Nos. of tree survived	monthly	O&M Contractor/Nagar Parishad	O&M Contractor/ Nagar Parishad
Sewer network to sustain operational efficiency and avoid clogging and early occurrence of leakages	Sewer network	to be included in the O&M plan prepared under the project	as per O&M plan	O&M Contractor/Nagar Parishad	O&M Contractor/ Nagar Parishad
Consent to operate (CTO) from RSPCB	STP/WTPs	CTO should be renewed before expired	5 yearly	Balotra Nagar Parishad /PHED	Balotra Nagar Parishad , PHED
Reuse of treated effluent and safe disposal	STP outlet	Treated effluent is being used in agriculture or other gainful purposes	Continuously	O&M Contractor/Nagar Parishad	O&M Contractor/ Nagar Parishad
Sludge Reuse and safe disposal	Sludge Management	Sludge is being gainfully used	Continuously	O&M Contractor/ Nagar Parishad	O&M Contractor/ Nagar Parishad
Monitoring of quality of water supplied to consumers	Consumer end-random sampling in all zones	As per CPHEEO norms (refer **Appendix** C-1)	Daily	O&M Contractor	DBO contractor Cost
Pipeline network to sustain operational efficiency and avoid early occurrence of leakages	Pipeline network	to be included in O&M plan prepared under the project	Daily/when required	O&M Contractor	DBO contractor Cost

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
Reduction of NRW	Pipe line networks	As per RUDSICO-EAP norms	Daily/when required	O&M Contractor	DBO contractor Cost

B. Institutional Arrangements

24. The Local Self Government Department (LGSD) is the executing agency which is responsible for the overall strategic guidance and ensure the compliance with ADB loan covenants. RUDSICO is the implementing agency responsible for the technical supervision and project implementation. The RUDSICO Board (under the chairmanship of the Honorable Minister), the LGSD and the City Level Monitoring Committees (CLMCs, under the chairmanship of their respective commissioner/executive officer) is proposed to monitor the project implementation. The PMU is already established at state-level (Jaipur) and headed by a dedicated Project Director. The PIUs have two zonal offices (1 in Jaipur and 1 in Jodhpur). Each zonal office is headed by an additional chief engineer. Urban Local Bodies (ULBs) will be the final custodian and user of the created infrastructure. As primary stakeholders, the ULBs will be involved and engaged in the day-to-day monitoring and implementation.

25. At the PMU level, the Project Director is being supported by Additional Project Director (Chief Engineer-level) and a Chief Engineer, who are being supported by Dy Project Directors (Technical and Administration) and a financial advisor. There is one project officer for Social and another project officer for Environmental aspects within PMU.

26. The PMU is being supported by the Project Management and Capacity Building Consultants (PMCBC). The PMCBC shall manage preparation/vetting design documents, tendering of contracts, implementation of resettlement, environmental management and gender action plans; setting and managing project performance monitoring systems, planning and managing implementation of training and capacity building as well as institutional strengthening activities besides preparing reports as per ADB requirements. PMCBC has engaged a social safeguard specialist and environmental safeguard specialist at the PMU level for managing all social and environmental safeguard related support services as envisaged in its scope of work. They will be assisted by concerned field level safeguard support staffs of CMSCs and PIU.

27. There are two zonal PIUs already established in Jaipur and Jodhpur. One PIU shall be established at every town before award of new projects. PIUs at the town-level shall be headed by a Superintending Engineer / Executive Engineer, who shall work as Project Manager and shall sign the contract documents, manage the contract and disburse payments as Drawing and Disbursing Officer.

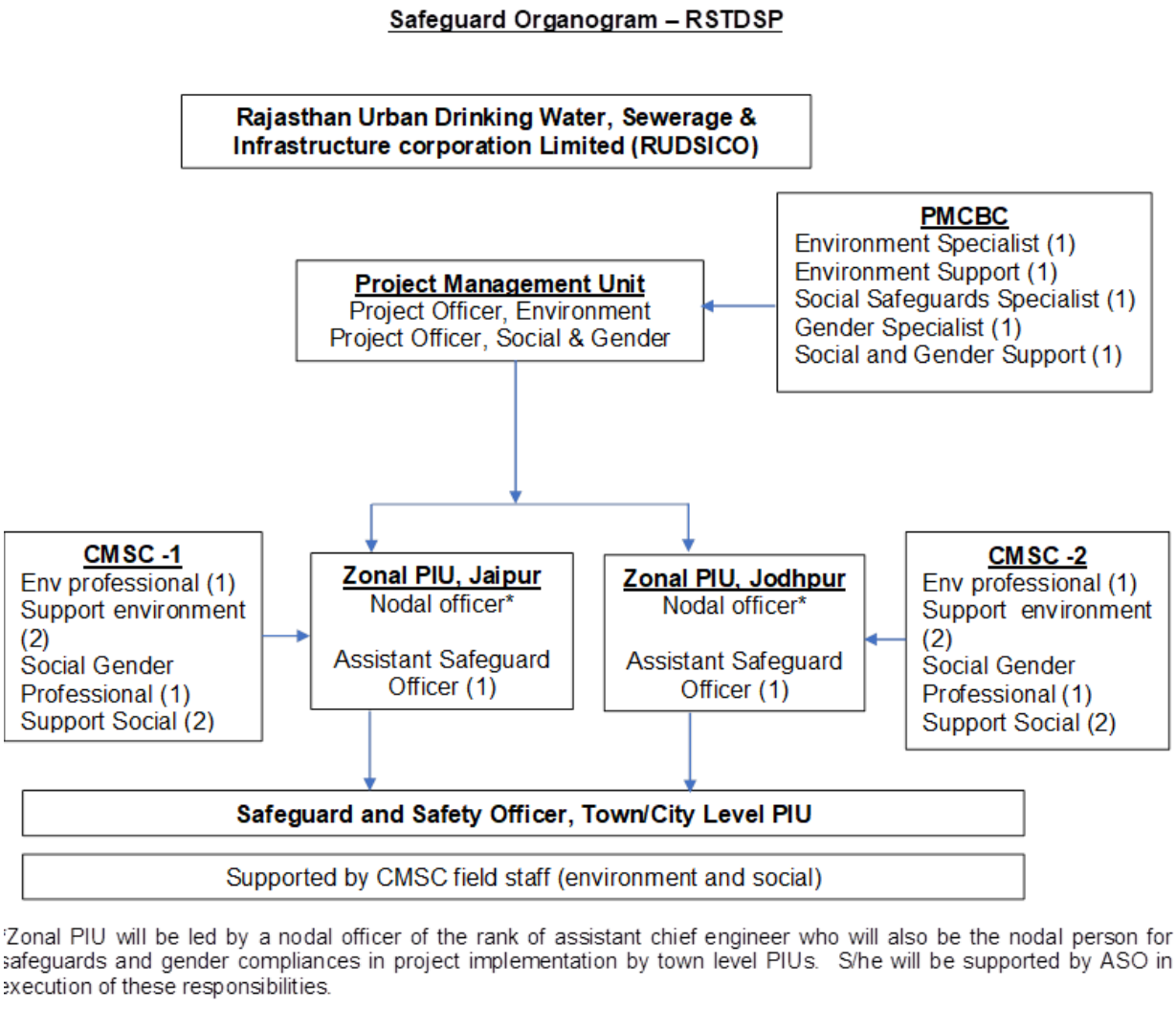
28. **Construction management and supervision consultants (CMSCs) -** 2 nos. of CMSCs catering to Jaipur and Jodhpur units are already established. They shall directly support PIUs in day to day contract management, construction supervision including quality management of ongoing works etc. This shall include work measurement, quantities, verification of bills of contractors etc. In compliance with the EMP, the CMSCs shall develop a strategy to overcome the difficulties of construction/traffic management in narrow streets and also prepare detailed plans for detour of traffic during excavation for pipe laying. The CMSC will propose and implement mechanism for coordination among all stakeholders such as traffic police, roads department, user committees, etc., for smooth construction execution. Adequate measures shall be taken for working near physical cultural resources involving close coordination with the Department of

Archaeology. The CMSC will lead design of surveys and investigations required for the protection of archaeological sites/heritage areas and prepare Archaeological Impact Assessments, or other agreed upon document to be approved by the Department of Archaeology for the archaeologically sensitive locations.

29. **Community awareness and public participation consultants (CAPPC)-** CAPC core unit is already established at PMU, Jaipur and at fields in ongoing 14 project towns. CAPC field team will be established in upcoming project towns after PIUs are formed in new towns. CAPC will closely work in the field (with PIUs) to facilitate creation of project awareness and ensuring public participation for all project works at the community level. This shall mainly involve house connections for water supply, sewerage and metering. CAPPC shall also undertake various IEC activities to promote and pursue health and hygiene among the communities.

30. **Figure 16** shows Environmental Safeguards Implementation Arrangements within RUDSICO-EAP and **Table 30** and **31** summarize the institutional responsibility of environmental safeguards implementation at all stages of the project.

Figure 16: Environmental Safeguards Implementation Arrangement



*Zonal PIU will be led by a nodal officer of the rank of assistant chief engineer who will also be the nodal person for safeguards and gender compliances in project implementation by town level PIUs. S/he will be supported by ASO in execution of these responsibilities.

31. **Project Management Unit.** RUDSICO will establish a state-level PMU, headed by dedicated project director, and housed in EAP division of RUDSICO. For the purpose of project implementation, 2 Zonal project implementation units (Zonal PIUs), at Jaipur and Jodhpur, headed by additional chief engineers (ACE) will be established. At PMU, there will be two dedicated project officers (i) project officer (Environment) and (ii) project officer (Social and Gender), who will be responsible for compliance with the environmental, social safeguards and gender in program implementation. Key responsibilities of the project officer (Environment) are enumerated in **Table 29**.

32. The PMU will be supported by 3 institutional consultants under the supervision and control of PD, PMU: (i) the project management and capacity building consultants (PMCBC) will support the PMU; (ii) 2 CMSC will support the 2 zonal PIUs and town-level PIUs; and (iii) CAPPC, will support the zonal PIUs and town-level PIUs.

33. **Zonal Project implementation units (Zonal PIUs).** There are 2 zonal level PIUs at Jaipur and Jodhpur. Under each zonal PIU, there will be city/town level PIUs, for ease of day-to-day monitoring and management at local level. The additional chief engineer at each Zonal PIU will serve as the Nodal Officer, Safeguards and Gender. Each Zonal PIU will be staffed with an assistant safeguards officer (ASO Environmental and Social Safeguards) who will assist PMU project officer (environment/social) in implementation of the environmental/social safeguards and GESI action plan in PIUs under its jurisdiction. Zonal PIUs will undertake internal monitoring and supervision and record observations throughout the project period to ensure that the safeguards and mitigation measures are provided as intended.

34. The zonal level ASO will oversee safeguards implementation by the city/town level PIUs, coordinate public consultations, information disclosure, regulatory clearances and approvals, implementation of resettlement plans, EMP implementation, and grievance redressal. Key safeguard tasks and responsibilities of the zonal PIU ASO (Environment) are enumerated in **Table 29**.

35. **Town/City Level Project Implementation Unit.** The town-level PIUs shall be responsible for the quality of works executed under the project and will be guided by the zonal PIUs. The city/town PIUs will be responsible for implementation of the IEE. The town-level PIUs will be headed by a project manager (executive engineer or assistant engineer) and supported by CMSC field staff. Environment Safeguard Professional of CMSCs will assist PIUs in implementation of environmental safeguard. At each PIU, the Assistant Project Manager will be given additional responsibilities of safeguard tasks and will be designated as safeguard and safety officer (SSO). The SSO will be assisted by the social and gender specialist and environment specialist of CMSC in reviewing updated/revised IEEs, etc. They will also be responsible for coordination of field level activities related to safeguards conducted by the DBO contractor and CMSC. Key responsibilities of the town-level environment specialist are enumerated in **Table 29**.

36. **Contractors.** The contractor will be required to update the IEE and will be responsible for providing final design (including pipe alignments) to the supervision consultant for finalization/updating of resettlement plan. The contractor shall appoint an environment, health and safety (EHS) engineer who will be responsible on a day-to-day basis for (i) ensuring implementation of EMP, (ii) coordinating with the town-level PIUs and environment specialists of

project consultant teams; (iii) community liaison,30 consultations with interested/affected people, (iv) field-level grievance redress; and (iv) reporting.

37. The Contractor has required to submitted to RUDSICO-EAP, for review and approval, a SEMP including (i) proposed sites or locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program per SEMP; (iv) budget for SEMP implementation. No works can commence prior to approval of SEMP.

38. A copy of the EMP or approved SEMP will be kept on-site during the construction period at all times. Non-compliance with, or any deviation from, the conditions set out in the EMP or SEMP constitutes a failure in compliance and will require corrective actions. The EARF and the IEEs specify responsibilities in EMP implementation during design, construction and O&M phases.

39. RUDSICO-EAP will ensure that bidding and contract documents include specific provision requiring Contractors to comply with: (i) all applicable labor laws and core labor standards on (a) prohibition of child labor as defined in national legislation for construction and maintenance activities; (b) equal pay for equal work of equal value regardless of gender, ethnicity, or caste and (c) elimination of forced labor; and (ii) the requirement to disseminate information on sexually transmitted diseases including HIV/AIDS, to employees and local communities surrounding the project sites.

Table 29: Institutional Roles and Responsibilities for Environmental Safeguards Implementation

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
PMU (Project Officer; Environment),	(i) Review REA checklists and assign categorization based on ADB SPS 2009 (ii) Review and approve EIA/IEE (iii) Submit EIA/IEE to ADB for approval and disclosure in ADB website (iv) Ensure approved IEEs are disclosed in RSTDSP/PMU websites and summary posted in public areas accessible and understandable by local people. (v) Ensure environmental management plans (EMPs) are included in the bid documents and contracts (vi) Organize an orientation workshop for PMU, PIU, ULB and all staff involved in the project implementation on (a) ADB SPS, (b) Government of	(i) Over-all environmental safeguards compliance of the project (iii) Monitor and ensure compliance of EMPs as well as any other environmental provisions and conditions. (i) Review monthly monitoring report (ii) Prepare and submit to ADB semi-annual monitoring reports (iv) If necessary, prepare Corrective Action Plan and ensure implementation of corrective actions to ensure no environmental impacts; (iii) Review and submit Corrective Action Plans to ADB (iv) Organize capacity building programs on environmental safeguards	Compliance monitoring to review the environmental performance of project component, if required and as specified in EMP

30 Reasonable size social outreach team (SOT) to be appointed by contractor to facilitate community liaison, consultations and R&R implementation (including resolution of grievances). Requirement of SOT will be included in bid document.

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	India national, state, and local environmental laws and regulations, (c) core labor standards, (d) OH&S, (e) EMP implementation especially spoil management, working in congested areas, public relations and ongoing consultations, grievance redress, etc. (vii) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs (viii) Organize an induction course for the training of contractors preparing them on EMP implementation, environmental monitoring requirements related to mitigation measures; and taking immediate actions to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation. (ix) Ensure compliance with all government rules and regulations regarding site and environmental clearances as well as any other environmental requirements (x) Assist PMU, PIUs, and project NGOs to document and develop good practice construction guidelines to assist the contractors in implementing the provisions of IEE. (xi) Assist in the review of the contractors' implementation plans to ensure compliance with the IEE.	(iv) Coordinate with national and state level government agencies (vi) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs (ix) Coordinate PIUs, consultants and contractors on mitigation measures involving the community and affected persons and ensure that environmental concerns and suggestions are incorporated and implemented	
PIU, Safeguard and Safety Officer (SSO)	(i) Ensure IEE is included in bid documents and contract agreements. Ensure cost of EMP implementation is provided. (iv) Disclose of approved EIAs/IEEs. (v) Obtain all necessary clearances, permits, consents, NOCs, etc. Ensure compliance	(i) Oversee day-to-day implementation of EMPs by contractors, including compliance with all government rules and regulations. (ii) take necessary action for obtaining rights of way; (iii) oversee implementation of EMPs, including	(i) Conducting environmental monitoring, as specified in the EMP. (ii) Issuance of clearance for contractor's post-construction activities as specified in the EMP.

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	to the provisions and conditions. (vi) EMP implementation regarding sites for disposal of wastes, camps, storage areas, quarry sites, etc. (vii) Organize an induction course for the training of contractors, preparing them on EMP implementation, environmental monitoring requirements related to mitigation measures, and on taking immediate action to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation.	environmental monitoring by contractors; (iv) take corrective actions when necessary to ensure no environmental impacts; (v) submit monthly environmental monitoring reports to PMU, (vi) conduct continuous public consultation and awareness; (vii) address any grievances brought about through the grievance redress mechanism in a timely manner as per the IEEs; and	
Consultant – 1.PMCBC-Environmental Safeguard Specialist – 1 no. Asbestos Expert – 1no. Heritage Expert – 1no. Biodiversity Expert – 1no.	(i) Review IEE/EMP submitted by CMSC and revise report to submit to PMU (ii) Assist PMU and PIU in obtaining all necessary clearances, permits, consents, NOCs, etc. Ensure provisions and conditions are incorporated in the IEE and detailed design documents. (iii) Assist in ensuring IEE is included in bid documents and contract agreements. (iv) Assist in determining adequacy of cost for EMP implementation. (v) Assist in addressing any concern related to IEE and EMP. (vi). Conduct specific assessment requirements	(i) Monitor EMP implementation (ii) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs.	
Consultant- 2. CMSC- 2 nos. Environmental safeguards professional	(i) Update initial environmental assessment for proposed project using REA checklists and submit to PIU/PMCBC (ii) Assist in summarizing IEE and translating to language understood by local people.	Monitoring of Implementation of EMP at site by contractor Recommend corrective action measures for non-compliance by contractors Assist in the review of monitoring reports submitted by contractors (iv) Assist in the preparation of monthly monitoring reports conduct continuous public consultation and awareness;	(i) Assist in the inspection and verification of contractor's post-construction activities.
Contractors (EHS Engineer)	(i) Review the IEE and provide information about changes needed as per revised design	(i) Implement EMP. (ii) Implement corrective actions if necessary.	(i) Ensure EMP post-construction requirements are satisfactorily complied

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	and scope of works to ESS of PMCBC for final revision of IEE (ii)Prepare EHS plan and take approval from CMSC/PIU and Ensure EMP implementation cost is included in the methodology. (iii) Undergo EMP implementation orientation by ESS of supervision consultant prior to start of works (iv) Provide EMP implementation orientation to all workers prior to deployment to worksites (v) Seek approval for camp sites and sources of materials. (vi) Ensure copy of IEE is available at worksites. Summary of IEE is translated to language understood by workers and posted at visible places at all times.	(iii) Prepare and submit monitoring reports including pictures to PIU (iv) Comply with all applicable legislation, is conversant with the requirements of the EMP; (v) Brief his staff, employees, and laborer about the requirements of the EMP and provide environmental awareness training to staff, employees, and laborers; (vi) Ensure any sub-contractors/ suppliers who are utilized within the context of the contract comply with all requirements of the EMP. The Contractor will be held responsible for non-compliance on their behalf; (vii) Bear the costs of any damages/compensation resulting from non-adherence to the EMP or written site instructions; (viii) Ensure that PIU and ACM/SO are timely informed of any foreseeable activities related to EMP implementation.	(ii) Request certification from PIU

C. Capacity Building and Development

219. Executing and implementing agencies need to have a sustained capacity to manage and monitor environmental safeguards. Although specialist consultants support will be available to PMU and PIUs, it is necessary to mainstream safeguards in day-to-day working. Therefore, PMU and PIUs require capacity building measures for (i) a better understanding of the project-related environmental issues; and (ii) to strengthen their role in preparation of IEE, implementation of mitigation measures, and subsequent monitoring. Trainings and awareness workshops are included in the project with the primary focus of enabling the PMU and PIU staff to understand impact assessments and carry out environmental monitoring and implement EMPs. After participating in such activities, the participants will be able to review environmental assessments, conduct monitoring of EMPs, understand government and ADB requirements for environmental assessment, management, and monitoring (short- and long-term), and incorporate environmental features into future project designs, specifications, and tender documents and carry out necessary checks and balances during project implementation.

220. PMCBC's ESS shall assess the capabilities of the target participants, customize the training modules accordingly and provide the detailed cost.

221. Typical modules would be as follows: (i) sensitization; (ii) introduction to environment and environmental considerations in water supply and wastewater projects; (iii) review of IEEs and integration into the project detailed design; (iv) improved coordination within nodal departments;

and (v) monitoring and reporting system. Specific modules customized for the available skill set will be devised after assessing the capabilities of the target participants and the requirements of the project. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites. The proposed training project, along with the frequency of sessions, is presented in **Table 30**.

Table 30: Capacity Building Program on EMP Implementation

Sl. No.	Description	Target Participants and Venue	Cost and Source of Funds
1	Introduction and Sensitization to Environmental Issues (1 day) - ADB Safeguards Policy Statement -EARF of RSTDSP -Government of India and Rajasthan applicable safeguard laws, regulations and policies including but not limited to core labor standards, OH&S, etc. -Incorporation of EMP into the project design and contracts -Monitoring, reporting and corrective action planning	All staff, ULBs and consultants involved in the project At PMU, Jaipur	PMU cost
2	Treated Effluent Reuse Concepts, Design and Management	All staff at PMU and ULBs	PMU cost
3	Sludge Reuse Concept, Design and Management	All staff at PMU and ULBs	PMU cost
4	EMP implementation (2 days) -Roles and responsibilities -OH&S planning and implementation -Wastes management (water, hazardous, solid, excess construction materials, spoils, etc.) -Working in congested areas, - Public relations - Consultations - Grievance redress -Monitoring and corrective action planning -Reporting and disclosure -Post-construction planning	All staff and consultants involved in the subproject All contractors before start of construction works At PIU	PMU cost
5	Plans and Protocols (1 day) -Construction site standard operating procedures (SOP) - Asbestos Management Plan -Heritage Impact Assessment -Biodiversity and Critical Habitat Assessment - Site-specific EMP -Traffic management plan -Spoils management plan -Waste management plan - Chance find protocol - O&M plans - Post-construction plan	All staff and consultants involved in the project All contractors before start of construction works or during mobilization stage. At PIU	PMU cost Contractors cost as compliance to contract provisions on EMP implementation
6	Experiences and best practices sharing - Experiences on EMP implementation - Issues and challenges - Best practices followed	All staff and consultants involved in the project All contractors All NGOs At PMU Jaipur	PMU Cost

7	Contractors Orientation to Workers on EMP implementation (OH&S, core labor laws, spoils management, etc.)	All workers (including manual laborers) of the contractor prior to dispatch to worksite	Contractors cost as compliance to contract provisions on EMP implementation

D. Monitoring and Reporting

222. Prior to commencement of the work, the DBO contractor will submit a compliance report to PIU ensuring that all identified pre-construction environmental impact mitigation measures as detailed in the EMP will be undertaken. PIU with the assistance of the SO and ESS of PMCBC, consultant will review the report and thereafter PMU will allow commencement of works.

223. During construction, results from internal monitoring by the DBO contractor will be reflected in their monthly EMP implementation reports to the PIU and ACM, CMSC. Project officer (Environment) and ACM will review and advise contractors for corrective actions if necessary. Monthly report summarizing compliance and corrective measures taken will be prepared by safeguard officer with the assistance of ACM and submitted to PMU.

224. Quarterly report shall be prepared by CMSC and PIU and submitted to PMU for review and further actions.

225. Based on monthly and quarterly reports and measurements, PMCBC will draft semi-annual report and submit PMU for their review and further submission to ADB (**Appendix** C-15). Once concurrence from the ADB is received the report will be disclosed in the Project website.

226. The PMU will submit semi-annual environmental and social safeguards monitoring reports to ADB, which will be reviewed and disclosed on ADB's website. The monitoring reports will be prepared by PMU with assistance from the PMCBC based on inputs from the PIU's safeguard officers, CMSC, contractors and NGOs, where relevant. The status of safeguard implementation, issues, and corrective actions including associated cost and schedule are to be clearly reported to ADB. The status of safeguards implementation will also be discussed at each ADB review mission and with necessary issues and agreed actions recorded in Aide Memoires. ADB will also carry out annual environmental and/or social (including gender) reviews of the Project. The outline of the semi-annual environmental monitoring report is in **Appendix C-15**. ADB's monitoring and supervision activities are carried out on an ongoing basis until a project completion report (PCR) is issued. Thus, semi-annual report, which may cover O&M of completed packages, will be submitted to ADB until PCR is issued.

227. ADB will review project performance against the project commitments as agreed in the legal documents. The extent of ADB's monitoring and supervision activities will be commensurate with the project's risks and impacts. Monitoring and supervising of social and environmental safeguards will be integrated into the project performance management system.

E. EMP Implementation Cost

228. Most of the mitigation measures require the contractors to adopt good site practice. DBO contractor being bound to adopt several mitigation measures through various legal obligations (e.g. BOCW Act, Labour acts etc.) such as use of PPEs, provide toilets and potable drinking water, labour camp management, safety at work sites, safety in equipment operations etc. which should be part of their normal procedures; are not included in EMP cost of this project. Mitigation that is the responsibility of PIU/ULB will be provided as part of their management of the project, so this also does not need to be duplicated here. Cost for the capacity building program is included

as part of the project. Regardless of these, project specific costs of mitigation by the construction contractors are included in the EMP budget for the civil works are enumerated here (**Table 31**).

Table 31: Cost Estimates to Implement the EMP

	Particulars	Stages	Unit	Total Number	Rate (INR)	Cost (INR)	Costs Covered By
A.	**Monitoring Measures**						
1	Air quality monitoring**	Pre-construction and Construction (quarterly)	per sample	16	4961	79376	Civil works cost
2	Noise levels monitoring**	Pre-construction and Construction (quarterly)	Per sample	16	1996	31936	Civil works cost
	Surface Water** Quality (quarterly)	Pre-construction and Construction	per sample	9	6720	60,480	
	Subtotal (A)					**1,71,792**	
B.	**Capacity Building**						
1.	Introduction and sensitization to environment issues	Pre-construction	lump sum			100,000	PMU
2.	EMP implementation	Construction	lump sum			50,000	PMU
3.	Plans and Protocols	Construction	lump sum			25,000	PMU
			lump sum			25,000	Civil works cost
4.	Experiences and best practices sharing	Construction/Post-Construction	lump sum			100,000	PMU
5.	Contractors Orientation to Workers on EMP implementation	Prior to dispatch to worksite	Lump sum			25,000	Civil works cost
	Subtotal (B)					**325,000**	
C	**Civil Works**						
1	Water Sprinkling for dust suppression	Construction	KL	5000	111	555,000	Civil works cost
2	Implementation of Asbestos Management Plan	Construction- Inventory Testing Overall Supervision for Asbestos Removal Storage Transportation Disposal / Treatment Documentation and Reporting	Lumpsum		-	25,00,000	Civil works cost
3	**Barricading**					**34,93,819**	
	Providing and fixing Barricading using 40 mm dia	Construction	m	504564	48.1	24269528	Civil works cost

	Particulars	Stages	Unit	Total Number	Rate (INR)	Cost (INR)	Costs Covered By
	M.S. pipe vertical and horizontal posts						
	Providing and fixing using 40 mm dia M.S. pipe ("B" class) as vertical post and PVC tape	Construction	m	49804	63.5	31,62,554	Civil works cost
	MS Pipe with nut and bolt and GI corruglated sheets	Construction	Sq.m.	12648	134.0	1694832	Civil works cost
	Sub Total (C)					**2,84,65,910**	
D	**Grievance Redressal Mechanism**				Lump sum	350,000	Civil works cost
	Sub Total (D)					**350,000**	
	Total (A+B+C+D+)				**INR**	**3,34,67525**	

Summary of EMP Cost incurred by Institution :

Contractor Cost - INR 3,31,67,525**/-**
PMU Cost - INR 275,000/-
Total - INR 3,34,67,525/-

(In Words: INR Three Crore Thirty Four Lakh Sixty Seven Thousand Five Hundred Twenty Five only)

X. CONCLUSION AND RECOMMENDATION

229. The process described in this document has assessed the environmental impacts of all elements of the Balotra water supply and sewerage subproject. All potential impacts were identified in relation to pre-construction, construction, and operation phases. Planning principles and design considerations have been reviewed and incorporated into the site planning and design process wherever possible; thus, environmental impacts as being due to the project design or location were not significant. During the construction phase, impacts mainly arise from the construction dust and noise, the need to dispose of large quantities of waste soil and import a similar amount of sand to support the sewer in the trenches; and from the disturbance of residents, businesses, traffic and important buildings by the construction work. The social impacts (access disruptions) due to construction activities are unavoidable, as the residential and commercial establishments exist along the roads where sewers will be laid. A resettlement plan has been developed in accordance with ADB SPS 2009 and Government of India laws and regulations.

230. Pokran Falsoond Balotra Siwana Water Project (PFBS): This scheme is supplying around 14.50 MLD of treated water at existing CWRs of Balotra located at Luni Pump House and Samdari Road Pump House from the off-take point near Jasol Phatak and Tube wells, constructed near village Bithuja and Kitnod. From these tube wells, approx. 7 MLD of water is being drawn, but the quality of water is poor due to the presence of high TDS and Chlorides.

231. Proposed sources for water supply for Balotra is - **Augmentation of Balotra Water**

Supply Scheme for Demand Load from 16.95 MLD to 19.05 MLD - Balotra Municipal Area is divided into 7 water supply zones; this zoning was done by PHED Scheme in 2016-2018. While the water supply is being made to the entire city with the source, storage, transmission and distribution network, pipe network and consumer connections. About 236 km of water distribution network already laid in town. The existing distribution system with AC (94 Km) and PVC (19.3 Km) pipes are very old with heavy leakages due to breakages and joints leakages due to ageing. The old Asbestos Cement (AC) & Polyvinyl Chloride (PVC) pipelines will be replaced by the new water mains of different sizes of HDPE pipes ie 75 mm to 315 mm dia & DI pipes ie 100mm to 250mm dia. Therefore, replacement of the existing distribution network and consumer connections along with installation of new consumer meters has been proposed in this project.

232. At present, the CWRs and OHSR have been executed for year 2044, but pumping machinery and Electrical Instrument have been executed for the demand year 2022. The subproject is formulated to address gaps in water supply infrastructure in a holistic and integrated manner under RSTDSP. To meet out the demand up to the Ultimate Design Year 2055 under the present plan, the following components have been proposed:

- **At Luni River H/W Pump House:** Required 4 nos of pumps installation for 3.97 MLD and 2.70 MLD load duly connected with Proposed suction, delivery side and Common header.
- **At Samdari road Pump House :** Required 4 nos of pumps installation for 1.09 MLD and 9.19 MLD load duly connected with Proposed suction, delivery side and Common header.
- **Transmission line:** Replacement of existing transmission line of 8380 m total length is proposed.
- **CWR and OHSR:** The existing CWR & ESR at various locations are already available with the existing system and Proposed system. Therefore, no additional CWR and OHSR are required.
- **Replacement of Distribution Network:** Replacement of 442.09 km HDPE and DI-K-7 distribution network in proposed 7 zones.
- **Replacement of Consumer Water Meters: Water** meter & Meter Box-19192 Nos in 7 zones for intermediate year 2040.
- **Upgradation of SCADA System:** Additional unit of SCADA system will be installed for the new facilities being proposed and it will be integrated with the existing SCADA (under installation at present).
- **O&M:** 10 years O&M for all new constructions.

233. The subproject is formulated to address gaps in water and sewerage infrastructure in a holistic and integrated manner. The Project Components include improvements in water supply and sewerage infrastructure to improve the service level of water supply as per PHED recommended norms of 135 LPCD. Whole the sewage generated from municipal limits shall also be treated at STP as per latest effluent norms.

234. The required water is made available from Indira Ghandhi Canal trough Pokran Falsoond Balotra Siwana Water Project (PFBS) water supply scheme. Public health engineering Department, GoR has allocated 19.56 MLD treated drinking water for Balotra town at Jasol Phatak off take poit. After commisning of subproject, no tube well water is required as the allocation of required water demand (14.5 MLD) is already made by PHED at Jasol Phaakak which will be increased to 19.56 MLD upto intermediate year. Source of raw water for PFBS scheme is Indira Gandhi Munak Canal, which is a sustainable surface water source. Tube well water will only be used in case of repair mainance of canal system and emergency only.

235. The sewage generated from the intercepted area including the proposed network under RUIDP Phase-IV is 9 MLD in the base year (2025) and 10 MLD in the intermediate design year (2040) and 10.8 MLD in ultimate design year (2055)**.** Presently there is 9.0 MLD capacity STP

based on SBR technology constructed under UIDSSMT Scheme, located at Jerla Village in Balotra Town. Additional STP of 1.0 MLD capacity based on SBR process under Hybrid Annuity Model (HAM Basis) at existing STP campus in Jerla Village is proposed to be constructed matching to future demand of 10 MLD in intermediate design Year 2040. Further to meet the required capacity for ultimate design year (2055) the treatment capacity will be increased in future phases.

236. Contractor will propose the plan with best methods for reuse of treated effluent and sludge as per guidelines of CPHEEO and best international practices in consultation with RUDSICO-EAP and Nagar Parishad and submit it in RUDSICO-EAP for approval. In order to aid preparation of a viable treated wastewater reuse and sludge reuse plan, an institutional and capacity building component shall be incorporated in the Project to enable the ULB staff to develop an understanding of the relevant issues.

237. Certain new initiatives have been taken in the project viz., promoting wastewater reuse, sludge reuse and contractor to work on private properties to provide sewerage connections. Hence, appropriate guidelines for these measures should be provided for these new initiatives. These could include viz., Guidelines for the ULBs for promoting wastewater reuse; Guidelines for the ULBs for sludge reuse; and Guidelines for the Contractors to work within the private properties.

238. Anticipated impacts of sewerage system during operation and maintenance will be related to repair of blocks, overflows and leakages in sewers. Sewers are not 100% watertight and leaks can occur at joints. Faulty section will be exposed and repaired following the same basic procedure as when the sewer was built. Also, sewer pipes require regular maintenance as silt inevitably collects in areas of low flow over time. Necessary equipment for cleaning and removal of blockages in the sewers are included in the project.

239. Anticipated impacts of water supply during operation and maintenance will be related to detection and repair of leaks, pipe bursts. These are, however, likely to be minimal, as proper design and selection of good quality pipe material shall mean that leaks are minimal. Leak repair work will be similar to the pipe-laying work.

240. The public participation processes undertaken during project design ensured stakeholders are engaged during the preparation of the IEE. The planned information disclosure measures and process for carrying out consultation with affected people will facilitate their participation during implementation. The project's grievance redress mechanism will provide the citizens with a platform for redressing grievances, and describes the channels, timeframe, and mechanisms for resolving complaints about environmental performance.

241. The Environmental Management Plan proposed in the project includes mitigation measures for identified impacts, training and capacity building activities, a monitoring plan to ensure that the environmental standards are maintained throughout the project construction period and a reporting plan to ensure that the project is implemented as per environmentally sound engineering and construction practices. The budgetary provision for mitigating the anticipated impacts by proposed subproject component is made in the project for effective implementation of the EMP Plan. the EMP Plan. Total estimated cost for EMP implementation is approx. INR /- **3,34,67,525 (In Words: INR** Three Crore Thirty Four Lakh Sixty Seven Thousand Five Hundred Twenty Five only)

242. The EMP will assist the PMU, PIU, Consultants and contractors in mitigating the environmental impacts, and guide them in the environmentally sound execution of the proposed

project. The EMP will also ensure efficient lines of communication between PIU/ULB, PMU, consultants and contractor. A copy of the EMP shall be kept on-site during the construction period at all times. The EMP shall be made binding on all contractors operating on the site, and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document shall constitute a failure in compliance.

243. The project will benefit the general public by contributing to the long-term improvement of water supply and sewerage system and community liveability in Balotra . The potential adverse environmental impacts are mainly related to the construction period, which can be minimized by the mitigation measures and environmentally sound engineering and construction practices.

244. Therefore, as per ADB SPS, the project is classified as environmental category B and does not require further environmental impact assessment.

245. **Recommendations.** The following are recommendations applicable to the subproject to ensure no significant impacts:

- Obtain all statutory clearances at the earliest time possible and ensure conditions/provisions are incorporated in the detailed design;
- PMU to ensure CTE &CTO for exting WTP and STP to be applied and taken before start of contruction.
- Include this IEE in bid and contract documents;
- Commitment from PMU, PIUs, project consultants, and contractors to protect the environment and the people from any impact during project implementation
- Update/revise this IEE based on detailed design and/or if there are unanticipated impacts, change in scope, alignment, or location;
- Update and implement the asbestos management plan per site-specific conditions;
- Conduct safeguards induction to the contractor upon award of contract;
- Ensure that sludge management protocols are compliant with environmental regulations (Solid Waste Management Rules 2000 and its amendments) and solid waste disposal should have a designated site (dumping on vacant lot is not allowed);
- Ensure contractor appointed qualified environment, health and safety (EHS) officers prior to start of works;
- Timely disclosure of information and establishment of GRM;
- Involvement of contractors, including subcontractors, in first level GRM;
- Strictly supervise EMP implementation;
- Continuous consultations with stakeholders;
- Documentation and reporting on a regular basis as indicated in the IEE.

Appendix 1: REA Checklist

Instructions:
The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer. This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB checklists and handbooks on (i) involuntary resettlement, (ii) indigenous peoples planning, (iii) poverty reduction, (iv) participation, and (v) gender and development. Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title: India/Rajasthan Secondary Towns Development Investment Program (RSTDP)/ Balotra Water Supply and Waste Water Project, Distt. Barmer, Rajasthan
Sector Division: ***Urban Development***

REA Checklist- Sewerage

SCREENING QUESTIONS	Yes	No	REMARKS
A. Project Siting Is the project area…			
Densely populated?	√		Subproject activities are scattered to entire town including the low, medium and densely populated areas.
Heavy with development activities?	√		Balotra Town is a developing town with continuous urban expansion, there are some textile and minor mineral industries.
Adjacent to or within any environmentally sensitive areas?		√	There are no environmental sensitive areas near the proposed sites.
Cultural heritage site		√	There are no any cultural heritage site in Balotra Municipal areas or near to any proposed site. There is no ASI protected monument in Balotra project area . There are 5 nos. state protected monuments which are namely- Kiradu Ke Mandir in Hatama, Fort of Siwana in Siwana, Mata Ka Mandir in Bisukala, Sun Temple in Dewaka and Jain Temple in Juna-Patarasar. Fort of Siwana in Siwana is the nearest monuments at 23 km in south-east direction.
Protected Area		√	
Wetland		√	
Mangrove		√	
Estuarine		√	
Buffer zone of protected area		√	
Special area for protecting biodiversity		√	
Bay		√	
Potential Environmental Impacts Will the Project cause…			

SCREENING QUESTIONS	Yes	No	REMARKS
Impairment of historical/cultural monuments/areas and loss/damage to these sites?		√	There are no any cultural heritage site in Balotra Municipal areas or near to any proposed site. In the Barmer district no ASI monuments are observed but there are 5 nos. state protected monuments which are namely- Kiradu Ke Mandir in Hatama, Fort of Siwana in Siwana, Mata Ka Mandir in Bisukala, Sun Temple in Dewaka and Jain Temple in Juna-Patarasar. Fort of Siwana in Siwana is the nearest monuments at 23 km in south-east direction.
Interference with other utilities and blocking of access to buildings; nuisance to neighboring areas due to noise, smell, and influx of insects, rodents, etc.?	√		Construction work may interfere with the water supply, power and communication lines. Access to houses and business may be affected during pipe laying works. Construction works may cause nuisance to public in form of traffic disturbance, utility disruption, increased noise and air pollution. Existing STP site is located away from inhabited areas.
dislocation or involuntary resettlement of people		√	Project does not involve land acquisition / involuntary resettlement /displacement. During the sewer construction, particularly in narrow streets there may be temporary disruption to household and there will also be temporary loss of livelihood to roadside vendors, the same is addressed in the Resettlement Plan.
Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	
Impairment of downstream water quality due to inadequate sewage treatment or release of untreated sewage?		√	There is only one surface water body “Luni River”. There is proposal of reuse of treated effluent from STP and unused treated effluent shall be discharged in to nearby land or drains, therefore treated effluent needs to meet prescribed standards set by the Central Pollution Control Board (CPCB).
Overflows and flooding of neighboring properties with raw sewage?		√	Raw sewage shall not cause any flooding and overflowing and will be ensured through regular operation and maintenance.
Environmental pollution due to inadequate sludge disposal or industrial waste discharges illegally disposed in sewers?	√		Inadequate sludge disposal may cause environmental pollution (soil and Water) This sewerage system will cater only domestic wastewater, no industrial wastewater discharge is allowed into the sewerage system. As a precaution, ULB should take responsibilities that wastewater from industrial units should not be allowed into sewers.
Noise and vibration due to blasting and other civil works?		√	Blasting for underground works is prohibited in RUDSICO-EAP works

SCREENING QUESTIONS	Yes	No	REMARKS
risks and vulnerabilities related to occupational health and safety due to physical, chemical, and biological hazards during project construction and operation?	√		Occupational health and safety risks are negligible due to chemical and biological hazards during construction in sewerage works, physical hazards may arise due to safety risks during construction works. During operation of sewerage system physical and biological hazards may cause health and safety risks to workers for which mitigation measures will be required
Discharge of hazardous materials into sewers, resulting in damage to sewer system and danger to workers?		√	This sewerage system will cater only domestic wastewater, no industrial wastewater discharge is allowed into the sewerage system.
Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances, and protect facilities?		√	No new STP or SPS is proposed in Subproject
Road blocking and temporary flooding due to land excavation during the rainy season?	√		Road blocking/diversion will be done during pipe laying with prior permission from concerned authorities. Contractor has to prepare proper traffic management plan before excavation on roads. Underground construction works (sewer laying, foundations) will be carried out in non-monsoon period. In Balotra Town , rainfall is scanty and confined only to a limited period. No impacts envisaged
Noise and dust from construction activities?	√		Road cutting (cement and bituminous roads) for sewer laying works is likely to generate noise and dust. Scheduling of works appropriately and prior information to the affected people will minimize the impact. Dust generation will be controlled through water sprinkling, immediate transportation of excess soil, covered transport etc.
traffic disturbances due to construction material transport and wastes?	√		Linear activities like sewer laying along the roads is likely to disrupt traffic. Vehicle movement for construction purpose will increase the traffic. Identification of alternate routes, allowing limited - at least one-way traffic, prior information about the works and alternative arrangements, providing information/sign boards etc will reduce the impact.
temporary silt runoff due to construction?	√		Mitigation measures will be required to protect silt runoff from construction activities during rains
hazards to public health due to overflow flooding, and groundwater pollution due to failure of sewerage system?	√		Sewerage system will be designed with applicable standards. Adequately trained staff and necessary equipment will be in place for regular operation and maintenance of the system. Proposed treatment system will be efficient and appropriate repair and maintenance procedure will be developed. Sufficient funds for operation will be ensured. Backup power supply system is part of project.

SCREENING QUESTIONS	Yes	No	REMARKS
deterioration of water quality due to inadequate sludge disposal or direct discharge of untreated sewage water?		√	No untreated/partially treated sewage will be disposed. STP has been designed to meet the peak demand. Regular monitoring of treated water will be conducted to check the treatment efficiency.
contamination of surface and ground waters due to sludge disposal on land?		√	Digested Sludge from reactors will be disinfected to be contamination free and will be collected and stabilized / dried before disposal/reuse. This process will ensure the dried sludge is harmless.
Health and safety hazards to workers from toxic gases and hazardous materials which may be contained in sewage flow and exposure to pathogens in sewage and sludge?		√	It is unlikely that sewage contain hazardous substances. Necessary apparatus and personal protection equipment will be provided. Staff will be trained in safe handling of sewage and sludge, and in cleaning of sewers.
large population increase during project construction and operation that causes increased burden on social infrastructure (such as sanitation system)?		√	Most of the unskilled workers will be hired locally, some of skilled workers will be brought from outside but numbers will not so large to have impacts on social infrastructure and services.
Social conflicts between construction workers from other areas and community workers?		√	The contractor will be utilizing the local labour force as far as possible; in case if it is necessary, labour camps and facilities will be provided appropriately. No conflicts envisaged
risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?		√	No explosives shall be used in project. Fuel and other chemicals will be used in very less quantities which will not have significant impact on community health and safety. Safe handling of fuels and chemicals will be ensured by contractor.
community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	√		Community safety risk may be there during construction during excavation for pipe laying, equipment and vehicle operation, construction of STP etc. for which mitigation measures will be required by contractor

REA Checklist- Water Supply			
SCREENING QUESTIONS	**Yes**	**No**	**REMARKS**
Water Supply			
Project Siting Is the project area-			
Densely populated?	√		Some part of the city is densely populated, whereas outer area is less dense. Water supply is proposed in all town including densely populated areas of town
Heavy with development activities?	√		Balotra is a developing town; urban expansion is considerable
Adjacent to or within, any environmentally sensitive areas?		√	
Cultural heritage site	√		There are no any cultural heritage site in Balotra Municipal areas or near to any proposed site. In the Barmer district no ASI monuments are observed but there are 5 nos. state protected monuments which are namely- Kiradu Ke Mandir in Hatama, Fort of Siwana in Siwana, Mata Ka Mandir in Bisukala, Sun Temple in Dewaka and Jain Temple in Juna-Patarasar. Fort of Siwana in Siwana is the nearest monuments at 23 km in south-east direction.
Protected Area		√	
Wetland		√	
Mangrove		√	
Estuarine		√	
Buffer zone of protected area		√	
Special area for protecting biodiversity		√	
Bay		√	
Potential Environmental Impacts Will the Project cause…			
Pollution of raw water supply from upstream wastewater discharge from communities, industries, agriculture, and soil erosion runoff?		√	There is only one surface water body “Luni River”. There is proposal of reuse of treated effluent from STP and unused treated effluent shall be discharged in to nearby land or drains, therefore treated effluent needs to meet prescribed standards set by the Central Pollution Control Board (CPCB).
Impairment of historical/cultural monuments/areas and loss/damage to these sites?		√	There are no any cultural heritage site in Balotra Municipal areas or near to any proposed site. In the Barmer district no ASI monuments are observed but there are 5 nos. state protected monuments which are namely- Kiradu Ke Mandir in Hatama, Fort of Siwana in Siwana, Mata Ka Mandir in Bisukala, Sun Temple in Dewaka and Jain Temple in Juna-Patarasar. Fort of Siwana in Siwana is the nearest monuments at 23 km in south-east direction
Hazard of land subsidence caused by excessive ground water pumping?		√	No new ground water source will be used for proposed water supply
Social conflicts arising from displacement of communities?		√	Project does not involve land acquisition /displacement. No social conflicts envisaged
Conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?		√	Water allocation is done for Balotra from Surface Water (canal) Sources as per Government norms.
Over pumping of ground water, leading to salinization and ground subsidence?	√		No new Ground water pumping will be done for water supply

Excessive algal growth in storage reservoir?		√	Periodical maintenance regime should be followed during O&M period to check algal growth in the system
Increase in production of sewage beyond capabilities of community facilities?		√	Sewerage system has been designed keeping in mind for future waste water discharge from residences
Inadequate disposal of sludge from water treatment plants?	√		Sludge handling and disposal will be considered DBO contractor
Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and protect facilities?		√	Proposed sites for pumping stations are demarcated with boundary wall and away from habitations
Impairments associated with transmission lines and access roads?		√	Old transmission lines will be replaced with new transmission line on existing ROWs therefore no such problem will emerge
Dislocation or involuntary resettlement of people		√	There is no resettlement of people for project implementation. Only temporary livelihood impacts are anticipated for which Resettlement Plan is also prepared for temporary impacts on vendors
disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	No such impact is envisaged
Noise and dust from construction activities?	√		All the construction machineries employed should comply with noise emission standards of Central Pollution Control Board. Dust suppression measures such as water sprinkling will be employed
Increased road traffic due to interference of construction activities?	√		Excavation and laying pipelines along public roads will interfere with the traffic. Construction material transport will increase traffic within city. Proper traffic management and construction planning will be ensured to minimize the interference
Continuing soil erosion/silt runoff from construction operations?	√		Construction work during monsoon shall be carried out with due care so that silt run off due to construction operation is prevented. No construction will be allowed during rains.
Delivery of unsafe water due to poor O&M treatment processes (especially mud accumulations in filters) and inadequate chlorination due to lack of adequate monitoring of chlorine residuals in distribution systems?	√		There is possibility of delivery of unsafe water due to poor O&M of storage and distribution facilities. O&M contractor has to ensure the quality of water to be supplied. Penalty provisions should be made in O&M contract for delivery of unsafe drinking water
Delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?		√	Not envisaged, pipes of corrosion free materials (PVC pipes) shall be used in the project and provision should be made in designs
Excessive abstraction of water affecting downstream water users?		√	Only water allocated for the water supply from PHED/WRD shall be used for proposed project.
Competing uses of water?		√	Only water allocated for the water supply from PHED/WRD shall be used for proposed project.
Increased sewage flow due to increased water supply		√	Sewerage system is already considered under RSTDSP works considering proposed water supply development works in Balotra
large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		√	Most of the unskilled workers will be hired locally, some of skilled workers will be brought from outside but numbers will not so large to have impacts on social infrastructure and services

Social conflicts if workers from other regions or countries are hired?		√	The contractor will be utilizing the local labour force as far as possible; in case if it is unavoidable, labour camps and facilities will be provided appropriately. No conflicts envisaged
risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?		√	No explosives shall be used in project. Fuel and other chemicals will be used in very less quantities which will not have significant impact on community health and safety. Safe handling of fuels and chemicals will be ensured by contractor.
community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	√		Community safety risk may be there during construction during excavation for pipe laying, equipment and vehicle operation, etc. for which mitigation measures will be required by contractor

Checklist for Preliminary Climate Risk Screening

Country/Project Title: India/Rajasthan Secondary Towns Development Investment Program (RSTDP), Balotra Town Water Supply and Waste Water Project, District Barmer, Rajasthan
Sector : Urban Development
Subsector: Water Supply and Waste Water
Division/Department: SARD/SAUW

Screening Questions		**Score**	**Remarks**[31]
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	0	No such issue may affect the project
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	No such issue may affect the project
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	No such issues may affect the project
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	0	No such issue may affect the project
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	No problem will envisaged in future which likely affect the performance of project output

[31] If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High): Low

Other Comments: The proposed subproject activity involves construction of water supply and sewerage networks and the anticipated environmental impacts are very marginal and the construction activity does not impose any threat to the existing climatic conditions.

Appendix 2: Compliance with Environmental Criteria for Subproject Selection

Components	Criteria	Compliance
All subprojects		
	Subproject will avoid potentially significant adverse impacts that are diverse, irreversible or unprecedented (ADB SPS Category A for environment).	Complied- Sub project is not having significant adverse impacts, anticipated impacts are temporary and reversible and can be mitigated through mitigation plans suggested in IEE
	Comply with all requirements of ADB SPS 2009 and follow procedures set in this EARF.	Complied- Sub project complies all the requirements of ADB SPS 2009
	Comply with relevant national, and local laws, rules and regulations regarding EIA, environmental protection, pollution prevention (water, air, noise, solid waste, etc.), wildlife protection, core labor standards, physical cultural resources, health and safety, and other laws in specific sectors as indicated below	Complied- Sub project complies all relevant national and local laws, rules and regulations applicable to this type of sub projects
	Reflect inputs from public consultations	Complied- Stakeholder's consultations are conducted in the project planning phase and suggestions are incorporated in project designs
Location	Avoid involuntary resettlement by prioritizing rehabilitation over new construction using vacant government land where possible, and taking all possible measures in design and selection of site or alignment to avoid resettlement impacts	Complied- All components of sub project are planned on government land only. No land acquisition is done to avoid any involuntary resettlement.
	Avoid or minimize the cutting of trees	Complied- Tree cutting is avoided as far as possible and if tree cutting is unavoidable, it has been minimized to lowest level and If any tree cutting is required for construction works, prior permission from local administration for tree cutting will be required and compensatory plantation as per RUDSICO-EAP policy will also be required
Biodiversity	Avoid locating subprojects in critical habitats, such as, but not limited to, wildlife/bird sanctuaries, national parks, tiger reserves, elephant reserves, conservation reserves or core zone of biosphere reserves. Appendix 1 provides preliminary analysis using the International Biodiversity Assessment Tool (IBAT) key biodiversity areas, protected areas, IUCN red list species and likelihood of critical habitats per town.	Not applicable- There are no any environmentally protected areas, core zones of biosphere reserves and highly valued habitat ibn the town

	Should not directly affect environmentally protected areas, core zones of biosphere reserves and highly valued habitat	
	If work is proposed with the aim of improving the conservation or management of designated subproject sites (e.g. improved drainage), this must only be undertaken: (i) after a comprehensive study and development of management plans and criteria; and (ii) with the direct involvement and approval of national and local bodies responsible for the subproject site.	Not applicable to this sub project
Physical Cultural Resources	Should not result in the destruction/damage of or encroachment onto physical cultural resources (PCR) [32] such as archaeological monuments; heritage sites and movable or immovable objects, sites, structures, group of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic or other cultural significance.	Complied- There are no any prohibited or protected areas or any archaeological or historical or protected monuments in the town. Project components will not impact any religious structures.
Existing Facilities to be rehabilitated or expanded	Conduct environmental audit of existing facilities[33]per ADB SPS	Complied- only refurbishment of existing OHSRs, CWRs, and pump houses and Rehabilitation of existing Tube Wells are proposed and no environmental issues are anticipated in proposed refurbishment/ rehabilitation works
Associated Facilities[34]	Analyze environmental impacts and risks to be included in the IEE	Not applicable to this sub project
Asbestos-containing materials (ACM) including, but not limited to, pipes, roofing, ceilings, insulation materials, excess pipes stored in PHED campuses, walls, etc.	Avoid handling or removing any ACM. Ensure asbestos concrete (AC) pipes facilities containing asbestos will not be disturbed and left in-situ. Appendix 14 (of EARF) provides asbestos management plan. RUDSICO shall include AMP in all contracts.	Being complied- No use of new ACM is proposed in sub project. There are existing asbestos cement pipes underground in the existing water supply networks, the alignment will be fine-tuned during the detailed design, to avoid existing AC pipe alignments as far as possible. Outline of ACM management plan is included in IEE and shall be updated before start of

[32] Physical cultural resources as defined as “movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings and may be above or below ground or under water. Their cultural interest may be at the local, provincial, national, or international level.”

[33] ADB SPS Appendix 4 para 12 on Existing Facilities

[34] ADB SPS Appendix 1 para 6 defines associated facilities as “not funded as part of the project (funding may be provided separately by the borrower/client or by third parties), and whose viability and existence depend exclusively on the project and whose goods or services are essential for successful operation of the project”

		construction works by DBO contractor
	When designing subproject infrastructure that involves excavation in urban areas the relevant authorities must be consulted to ascertain the location of any ACM prior to any subproject activity. Locations of new infrastructure must then be designed to avoid excavating or disturbing any ACM.	Will be complied- DBO contractor shall provide details (location and quantity) of ACMs in the updated ACM management plan
Right-of-way	Locate water supply pipelines within the right of way (ROW) of other linear structures (roads, irrigation canals) as far as possible, to reduce new land acquisition.	Complied- Water supply pipes will be laid with ROW of roads
	Ensure that pipelines ROW do not require land acquisition from individual farmers that is a significant proportion of their total land holding (>10%).	Complied- no land acquisition is required for pipe laying works
Water Supply		
Sustainability	Utilize water sources at sustainable levels of abstraction only (i.e. without significant reductions in the quantity or quality of the source overall)	Being Complied- Presently source of water at Balotra Town is ground water whereas surface water IGNP water will be used in proposed water supply system under RSTDSP.
Quality (raw water, treated water)	Ensure that water supply to consumers comply with the national drinking water standards at all times and confirm this by regular monitoring at WTPs and in domestic premises.	Will be complied- Regular water quality monitoring shall be done and before supply of the water to consumers , it shall be ensured that water quality meet the national drinking water standards at all times
	Avoid using water sources that may be polluted by upstream users	Being Complied- there are no source of pollution in IGNP Canal.
	Avoid water-use conflicts by not abstracting water that is used for other purposes (e.g. irrigation)	Being Complied- Only allocated water from source will be utilized for proposed water supply
Location	As far as possible locate all new facilities – Water Treatment Plants (WTP), Tube Wells (TW), etc. away from houses, shops or any other premises used by people, thus establishing a buffer to reduce the effects of noise, dust and the visual appearance of the site.	Will be complied
	Locate WTPs at sites where there is no risk of flooding or other hazards that might impair functioning of the WTP or present a risk of damage to the WTP or the surrounding area	Not applicable to this sub project- no WTP is proposed under the sub project
Design	Ensure that the water supply system improvements are combined with improvements in sewerage to deal with the increased discharge of domestic wastewater.	Complied- Water supply and sewerage system in town are designed considering the water supply to consumers at standard of 135 lpcd therefore increased discharge due to increased

		water supply will not affected sewerage system of town
Sewerage		
Location	Previous projects considered 500m as distance consideration from nearest habitation. This has been reduced to 100m considering facilities will be located in developed areas and technology to be used. RSTDSP considered using Sequencing Batch Reactor (SBR) technology in STPs, which is proven to cause minimal odor as compared to other treatment technologies such as Waste Stabilization Pond or Activated Sludge Process.	Complied- No dense habitations are found within 100 mts from STP site. Existing STP haing sufficient area for future expansion of STP
	As far as possible Sewage Pumping Stations (SPS) and wet wells are located preferably 50m from any inhabited areas and from sites such as hospitals, schools, temples, etc. to minimize nuisance impacts from odor, rodents, etc.	NO SPS proposed in subproject.
	Locate STP at sites where there is no risk of flooding or other hazards that might impair function of the STP or present a risk of damage to the STP or the surrounding area	Complied- There is no risk of flooding or other hazards at existing STP that might impair function of the STP or present a risk of damage to the STPs or the surrounding area.
Quality	Ensure that sewage is treated at all times to national waste water discharge standards and confirm this by regular monitoring of effluent from the STP.	Will be complied- Regular monitoring of Treated waste water shall be done and after meeting all national waste water discharge standards
Treated water	Ensure that no wastewater is discharged into a water course in which it could be a hazard to downstream users (e.g. a waterway that is used as a source of water for domestic or municipal supply)	Will be complied- No STP is proposed in the project the treated water from STP is used by farmers
Sludge	Include measures to ensure the safe disposal of sewage sludge and if possible, to promote its safe and beneficial use as an agricultural fertilizer	It is proposed that safe and beneficial use of sewage sludge as an agricultural manure shall be promoted
Right-of-way for sewer network	Locate sewage pipelines within the right of way (ROW) of other linear structures (e.g. roads) wherever feasible, to reduce new land acquisition.	Complied- Sewers pipes will be laid along the roads/streets in the City within the road right of way (ROW) therefore there is no need of land acquisition.
	Ensure that routes of sewage mains do not require land acquisition from individual farmers that is a significant proportion of their total land holding (10%)	

Appendix 3: Audit report of existing Associated Facilities

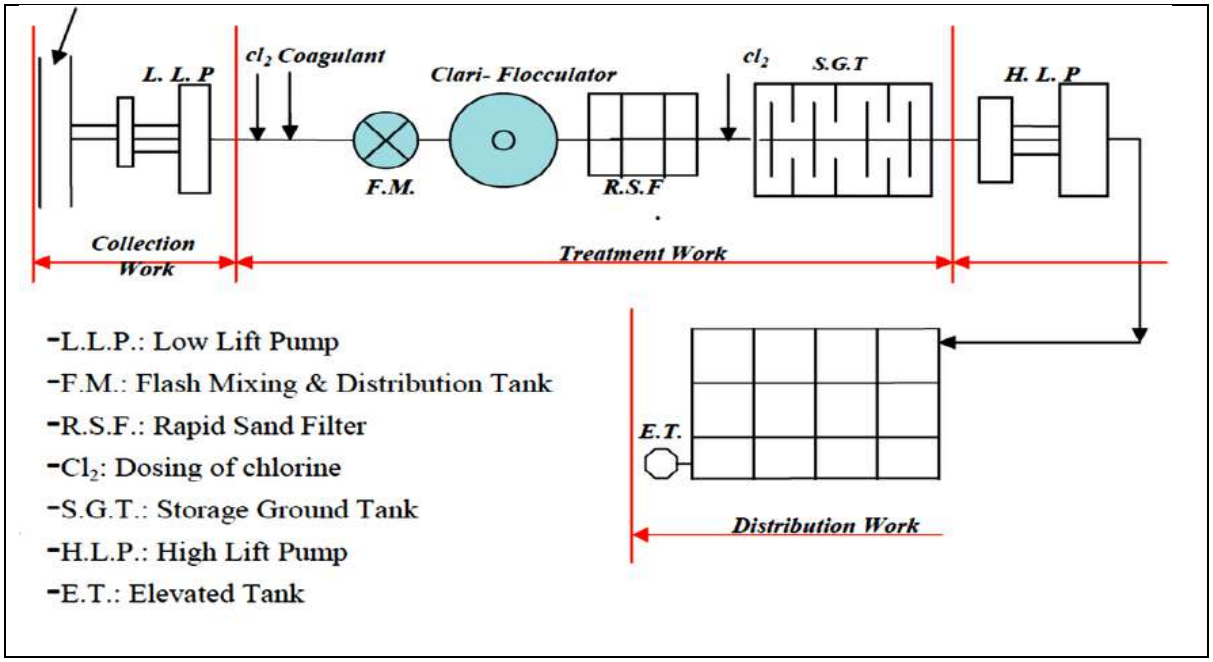
Environment Audit of Existing WTP 119 MLD at Bailiya, Pokran

Introduction

Under the present proposal water supply for Balotra town will be made from Biliya WTP constructed under Pokran Falsoond Balotra Siwana Water Project (PFBS). Biliya WTP has a treatment capacity of 119 MLD and presently the plant is supplying about 14.50 MLD of treated water at existing CWRs of Balotra located at Luni Pump House and Samdari Road Pump House from the off-take point near Jasol Phatak. A provision of 14.5 MLD is made by PHED for the treated water supply from PFBS scheme which will be increased to 19.56 MLD in future (2044) as per the treated water requirement of town.

<table>
<tr><td colspan="2">WTP, Biliya, near Pokaran</td></tr>
<tr><td>1. Location of Plant:</td><td>Village Biliya, near Pokaran, District Jaiselmer.
Latitude: 26°54'46.45"N
Longitude: 71°52'57.74"E</td></tr>
<tr><td>2. Capacity (MLD):</td><td>119 MLD</td></tr>
<tr><td>3. Technology:</td><td>Rapid Gravity Filter</td></tr>
<tr><td>4. Executing agency:</td><td>PHED, Government of Rajasthan</td></tr>
<tr><td>5. Implementing agency:</td><td>PHED, Government of Rajasthan</td></tr>
<tr><td>6. Asset Owner:</td><td>PHED, Government of Rajasthan</td></tr>
<tr><td>7. Date of completion of construction works of WTP:</td><td>May, 2014</td></tr>
<tr><td>8. Status of work progress of WTP: (completed/uncompleted components with %)</td><td>Completed and no work proposed under present subproject.</td></tr>
<tr><td>9. Nos., locations and capacities of Pumping Stations:</td><td>
<table>
<tr><th>S. N</th><th>Location</th><th>Capacity</th><th>Const. year</th></tr>
<tr><td>1</td><td>Nachana</td><td>3.2 MLD</td><td>2014</td></tr>
<tr><td>2</td><td>Ajasar</td><td>3.1 MLD</td><td>2014</td></tr>
<tr><td>3</td><td>Biliya</td><td>125 MLD</td><td>2014</td></tr>
</table>
</td></tr>
<tr><td>10. Total Area of land used for WTP (sq.m.):</td><td>1,20,000 (12 Ha) campus</td></tr>
<tr><td>11. Land ownership details: (title)</td><td>PHED, Government of Rajasthan</td></tr>
<tr><td>12. Details of water supplied areas with WTP: (ward nos./localities)</td><td>580 villages (177 of Jaisalmer and 403 of Barmer districts) together with 4 towns namely Pokhran, Balotra, Falsoond and Siwana.</td></tr>
<tr><td>13. WTP Components</td><td>
<table>
<tr><th>Component</th><th>Nos.</th></tr>
<tr><td>Flash Mixer</td><td>3</td></tr>
<tr><td>Floculator</td><td>8</td></tr>
<tr><td>Clarifier</td><td>2</td></tr>
<tr><td>Rapid Sand Filters and Filter house</td><td></td></tr>
<tr><td>Filter Sand</td><td>10 Beds</td></tr>
<tr><td>Wash Water Tank</td><td>One, 750KL</td></tr>
<tr><td>Wash Water Pumps</td><td>2</td></tr>
<tr><td>Air Blower</td><td>2</td></tr>
<tr><td>Chemical House</td><td>1</td></tr>
<tr><td>Solution Tank</td><td>6</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td></td><td><table>
<tr><td>Pure Water Sump and Sump House</td><td>1</td></tr>
<tr><td>Capacity of Sump –(CWR)</td><td>10,850 KL</td></tr>
<tr><td>Raw Water Reservoir</td><td>300 Million Litres</td></tr>
<tr><td>Pump House</td><td>3</td></tr>
<tr><td>Store House</td><td>1</td></tr>
<tr><td>Vacuum feed type Chlorinators</td><td>Pre-2, Post-2</td></tr>
</table></td></tr>
<tr><td>14. Is there facility of laboratory for testing these parameters, if yes, give details</td><td>Yes in PHED Campus</td></tr>
<tr><td>15. Quantity of Sludge generated from WTP:</td><td>600 MT/month</td></tr>
<tr><td>16. Sludge Dewatering and drying system:</td><td>By evaporation</td></tr>
<tr><td>17. What are the proposals/methods for reuse/disposal of generated sludge from WTP:</td><td>For the plantation in nurseries</td></tr>
<tr><td>18. Status and type of electricity connection: (connection number and approved load, KW)</td><td>HT-1, (1350 HP)</td></tr>
<tr><td>19. Whether DG set installed, if yes give capacity and type of DG set:</td><td>40.0 KVA</td></tr>
<tr><td>20. Numbers of employees for operation of plant (designation wise numbers of employees):</td><td>19</td></tr>
<tr><td>21. WTP Process</td><td>Rapid gravity filters employing graded sand are washed by separate use of air and water through the bed by reverse flow and the used wash water is removed by a wash water collection channel. Combined air-water wash would intermix the media and result in loss of media. The first operation is to allow the filter to drain down until the water lies a few centimetres above the top of the bed. Air is then introduced through the collector system at a rate of about 6.5–7.5 mm/s. The air breaks up the surface scum and dirt is loosened from the surface of the sand grains. This is followed by an upward flow of water at a carefully selected velocity to expand and fluidise the bed. Under this condition the voids between grains of sands are increased and resulting rotation of grains and consequent attrition between grains produces a scouring action to remove attached deposits. The wash rate should be just sufficient to achieve fluidisation velocity (incipient fluidisation) with little bed expansion. Increasing the backwash rate beyond this state would be counter productive because as the distance between sand grains increases, the scouring action is reduced. High backwash rates may result in loss of sand and wastage of water and energy. The wash water collection channel cell is usually placed about 100–150 mm above the sand.</td></tr>
<tr><td colspan="2">Process Flow Diagram of WTP at Biliya, PHED Headworks</td></tr>
</table>



-L.L.P.: Low Lift Pump
-F.M.: Flash Mixing & Distribution Tank
-R.S.F.: Rapid Sand Filter
-Cl_2: Dosing of chlorine
-S.G.T.: Storage Ground Tank
-H.L.P.: High Lift Pump
-E.T.: Elevated Tank

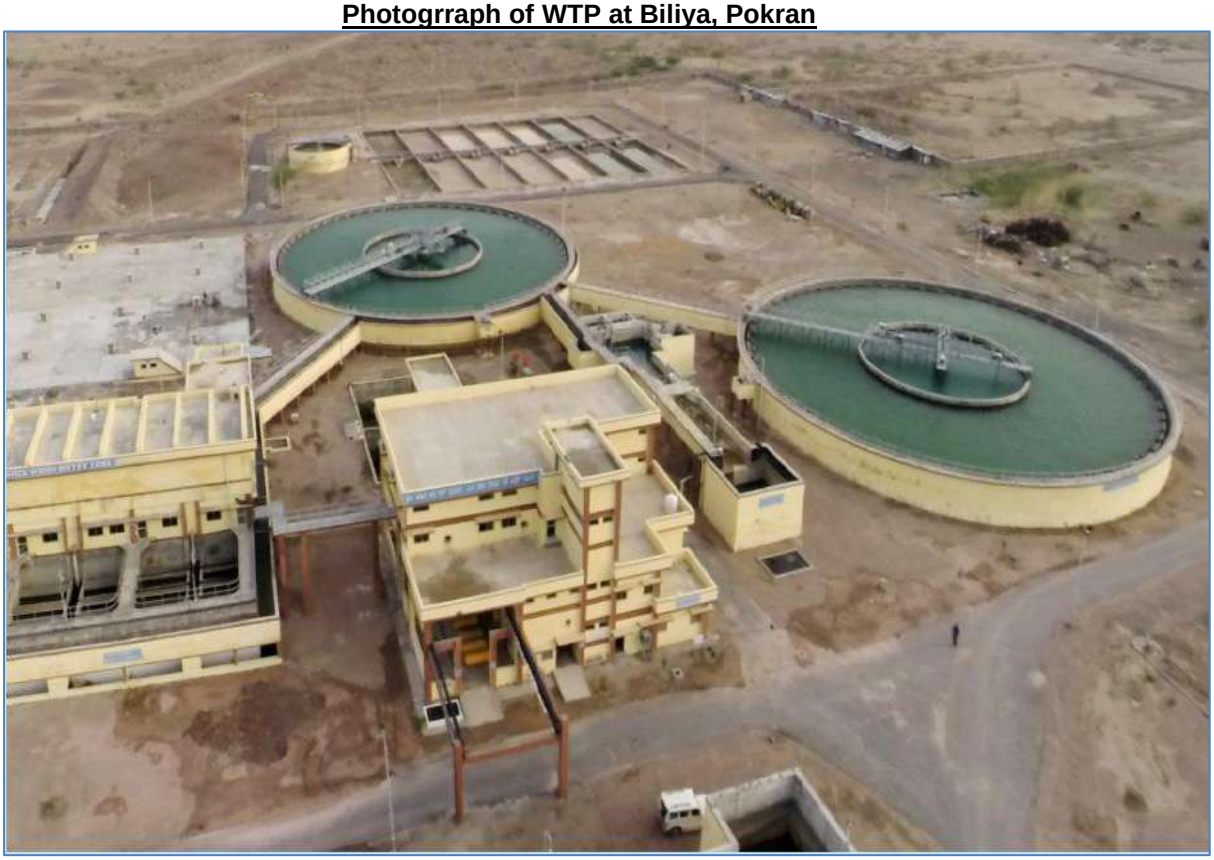
Comparison of Drinking Water Standards with National Standards for Drinking Water and WHO Guidelines for WTP treated water (Source water for supply under Balotra WS Project)

Group	National Standards for Drinking Water[a]			WHO Guidelines for Drinking-Water Quality, 4th Edition, 2011[b]	Applicable Per ADB SPS [c, d]	Water Quality of Biliya, Pokran WTP treated water	
	Parameter	Unit	Max. Concentration Limits[d]			20.09.2022	09.01.2023
Physical	Turbidity	NTU	1 (5)	-	1 (5)	1.0	0.3
	pH		6.5 – 8.5	none	6.5 – 8.5	7.5	7.7
	TDS	mg/l	500 (2,000)	-	500 (2,000)	210	210
	Fluoride	mg/l	1 (1.5)	1.5	1 (1.5)	0.3	0.29
Chemical	Chloride	mg/l	250 (1,000)	none established	250 (1,000)	40	30
	Nitrate	mg/l	45	50	45	6.0	5
	Total Hardness	mg/l	200 (600)	-	200 (600)	110	110
	Residual Chlorine	mg/l	0.2	5	0.2	0.0	0.0

[a] Bureau of India Standard 10500: 2012.
[b] Health-based guideline values.
[c] Per ADB SPS, the government shall achieve whichever of the quality standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.
[d] Figures in parenthesis are maximum limits allowed in the absence of alternate source.

Based on the examination of WTP treated water of Biliya treatment plant on two different dates, WTP treated water of Biliya plant near Pokhran qualify all the parameters for which the examination and found meeting GOI's drinking water parameters. Therefore, WTP treated water is suitable for drinking purpose and qualify the criterion for drinking purposes for the examined parameters.

Photogrraph of WTP at Biliya, Pokran



Google earth view of WTP at Biliya, Pokaran

Compliance with Applicable National and State Laws, Rules, and Regulations

Law, Rules, and Regulations	Description and Requirement	WTP at Biliya, Pokran,
		Y = compliant (if applicable, specify expiration date of permit/clearance) N = non-compliant35 N/A = not applicable (state justification)
EIA Notification	The EIA Notification of 2006 states that environmental clearance is required for certain defined activities/projects.	N/A Environmental clearance is not required as WTPs are not listed in the EIA Notification's "Schedule of Projects Requiring Prior Environmental Clearance"
Manufacture, Storage, and Import of Hazardous Chemical Rules, 1989	Storage of chlorine (threshold quantity greater than 10 tons but less than 25 tons) in WTPs will require clearance from PESO	N/A Storage of is always less 10 tons
Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments	Consent to operate from RSPCB	N CTO for WTP will be applied and taken before start of construction works
Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments.	Consent to operate from RSPCB	N For DG set Consent will be applied and taken before start of works
Environment (Protection) Act, 1986 and CPCB Environmental Standards	Emissions and discharges from the facilities to be created, refurbished, or augmented shall comply with the notified standards.	Y No source of waste except very little quantity silt and clay.
Noise Pollution (Regulation and Control) Rules, 2002 amended up to 2010	Applicable ambient noise standards with respect to noise for different areas/zones	Y No source of noise
National Institute of Occupational Safety and Health (NIOSH) Publication No. 2002-149	Compliance with NIOSH Guidance for Controlling Potential Risks to Workers Exposed to Class B Biosolids	Y Frequent Training and proper PPEs are required
Forest (Conservation) Act, 1980 and Forest	As per Rule 6, every user agency, who wants to use any forest land for non-forest	N/A

[35]Compliant = There is sufficient and appropriate evidence to demonstrate that the particular regulatory requirement has been complied with; non-compliant = clear evidence has been collected to demonstrate the particular regulatory requirement has not been complied with.

Law, Rules, and Regulations	Description and Requirement	WTP at Biliya, Pokran,
		Y = compliant (if applicable, specify expiration date of permit/clearance) N = non-compliant35 N/A = not applicable (state justification)
Conservation Rules, 2003 as amended	purposes shall seek approval of the central government.	
Ancient Monuments and Archaeological Sites and Remains Rules of 1959	No development activity is permitted in the “protected area,” and all development activities likely to damage the protected property are not permitted in the “controlled area” without prior permission of the Archaeological Survey of India (ASI). Protected property includes the site, remains, and monuments protected by ASI or the State Department of Archaeology.	N/A
The Child Labor (Prohibition and Regulation) Act, 1986	No child below 14 years of age will be employed or permitted to work in any of the occupations set forth in the Act’s Part A of the Schedule or in any workshop wherein any of the processes set forth in Part B of the Schedule are present.	Y No children are engaged.

Corrective Action Plan

In the existing 119 MLD WTP unit at Biliya, Pokran CTO are to be taken for both WTP plant and DG set under Water and Air Act, therefore consent to establish and consent to operate will be taken from RSPCB.

Annexure-1. Water Quality of WTP Treated water at Biliya, Pokran (Test report by PHED, Laboratory)

PUBLIC HEALTH ENGINEERING DEPARTMENT LABORATORY
JAISALMER (RAJ.)
REPORT OF THE CHEMICAL EXAMINATION OF WATER

NO. Lab/Tech. (Chemical) 2022 -2023/606 Date 9-01-2022

To, अधिशाषी अभियन्ता
जन स्वा० अभि० विभाग
पोकरण खण्ड - नाचना

District Jaisalmer
Tehsil

Sample Collected by :-

Reference 752/5-01-2023

Date of Collection 5-1-2023 Date of receipt 5-1-2023 Date of Examination 9-1-2023

L.S. No.	-	874	875	876
Source	-	Raw water	Filter Bed	C.W.R.
Village	-			
Code No.	-	— RGF.	Bilya	—

1. pH	7.9	7.8	7.7
2. Turbidity (NTU)	Less 5	0.3	0.3
3. Color			
4. Odour			
5. Temperature °C			
6. Alkalinity Phenolphthein ($Ca CO_3$)	NIL	NIL	NIL
7. Alkalinity methly orange ($Ca CO_3$)	80	90	90
8. Total Hardness	100	110	110
9. Calcium Hardness	60	70	70
10. Magnesium Hardness	40	40	40
11. Carbonate Hardness	80	90	90
12. Non Carbonate	20	20	20
13. Chlorides as Cl	30	30	30
14. Sulphate as So_4			
15. Nitrate as No_3	5	5	5
16. Total Dissolved Solids	200	210	210
17. Fluorides	0.28	0.29	0.29
18. Sp. Conductivity (umhos/cm)	—	—	2.0
19. RSC/2			

Note - All Result except pH are mg/L

NO. Date

Junior Chemist
P.H.E.D. Lab, Jaisalmer

1. Copy forward to the chief chemist phed raj. jaipur
2. Copy forward to the superintending phed lab jodhpur.

Junior Chemist
P.H.E.D. Lab, Jaisalmer

PUBLIC HEALTH ENGINEERING DEPARTMENT LABORATORY
JAISALMER (RAJ.)
REPORT OF THE CHEMICAL EXAMINATION OF WATER

NO. Lab/Tech. (Chemical) 2022-2023/410 Date 30.9.2022

To, [illegible] District Jaisalmer
Tehsil

Sample Collected by :-

Reference 441/19-9-2022

Date of Collection 19-9-2022 Date of receipt 19-9-2022 Date of Examination 20-9-2022

L.S. No. -	488	489	490	491	492
Source -	Raw Water	Filter Bed	C.W.R.	C.W.R.	Tanka
Village -	RGF	~~[illegible]~~	~~[illegible]~~	M.R. Well ~~[illegible]~~	Jail ~~[illegible]~~
Code No. -					
1. pH	7.9	7.5	7.4	7.4	7.4
2. Turbidity (NTU)	48.0	1.0	0.8	0.8	0.5
3. Color					
4. Odour					
5. Temperature °C					
6. Alkalinity Phenolphthein ($Ca CO_3$)	NIL	NIL	NIL	NIL	NIL
7. Alkalinity methly orange ($Ca CO_3$)	90	100	100	120	120
8. Total Hardness	110	110	110	110	110
9. Calcium Hardness	50	50	50	50	50
10. Magnesium Hardness	6.0	6.0	6.0	6.0	6.0
11. Carbonate Hardness	90	100	100	110	110
12. Non Carbonate	20	10	10	NIL	NIL
13. Chlorides as Cl	30	40	30	50	50
14. Sulphate as So_4					
15. Nitrate as No_3	5	6	5	6	6
16. Total Dissolved Solids	200	210	210	270	270
17. Fluorides	0.28	0.29	0.3	0.32	0.32
18. Sp. Conductivity (umhos/cm)					
19. Rs Cl	—	—	2.0	1.5	1.0

Note - All Result except pH are mg/L

NO. Date

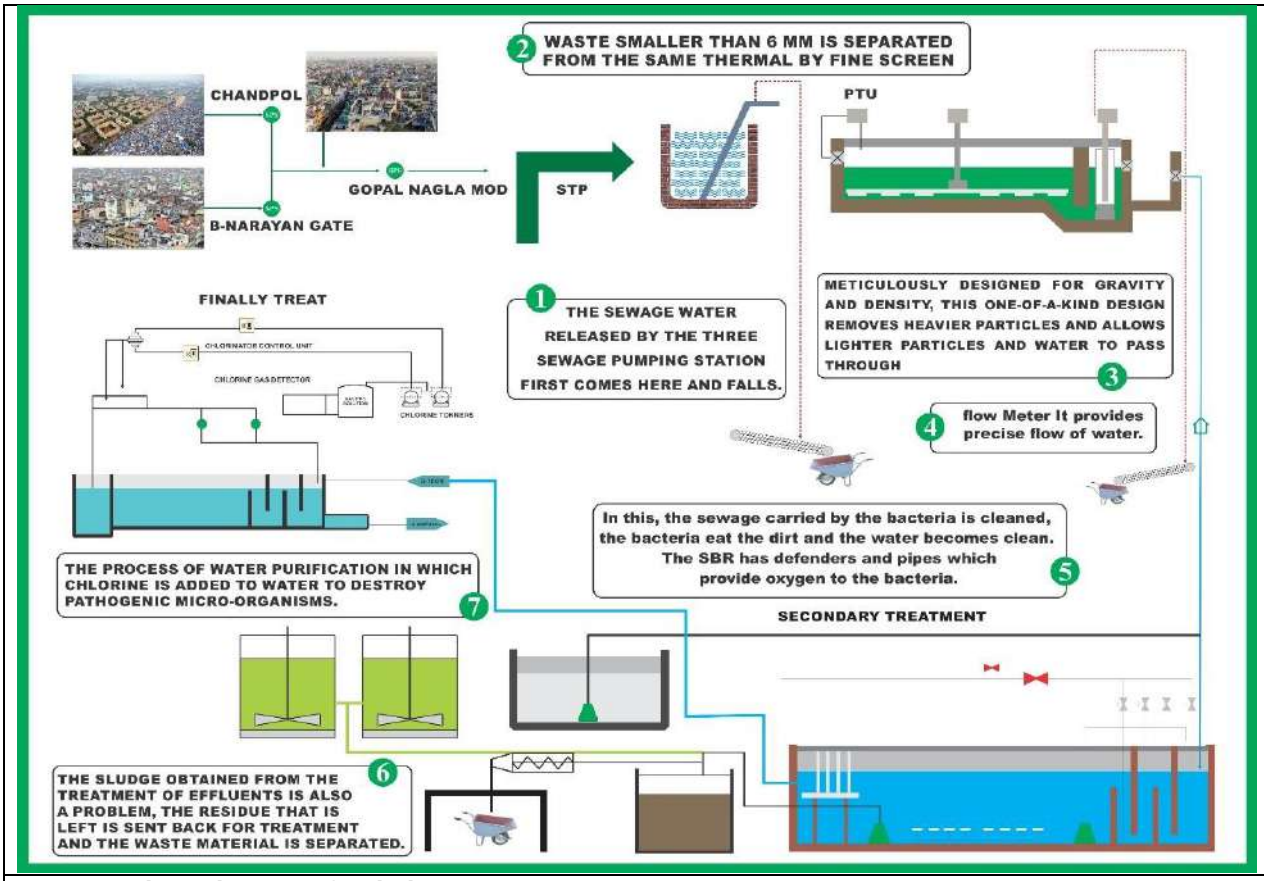
Junior Chemist
P.H.E.D. Lab, Jaisalmer

1. Copy forward to the chief chemist phed raj. jaipur
2. Copy forward to the superintending phed lab jodhpur.

Junior Chemist
P.H.E.D. Lab, Jaisalmer

ENVIRONMENT AUDIT REPORT OF EXISTING 9 MLD STP

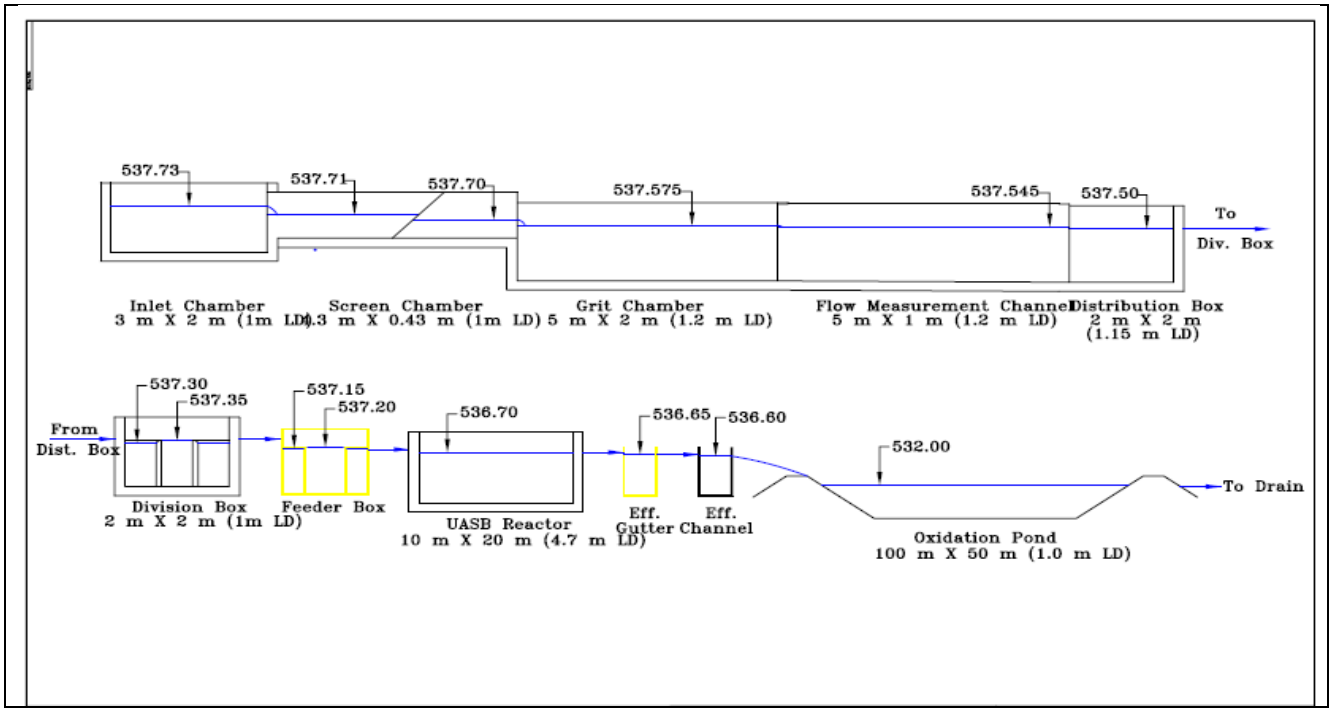
<table>
<tr><td>Location</td><td>Latitude: 25°52'52.41"N
Longitude: 72°13'11.94"E</td></tr>
<tr><td>Start of operation (year)</td><td>2016</td></tr>
<tr><td>Owned by</td><td>Nagar Parishad Balotra</td></tr>
<tr><td>Capacity</td><td>9.0 MLD</td></tr>
<tr><td>Sewage treatment process</td><td>Sequencing Batch Reactor (SBR) sewage treatment plant.
A Sequencing Batch Reactor (SBR) is a fill and draw activated treatment system. As such, SBR are capable of handling all waste waters commonly treated by conventional activated sludge plants. Municipal and industrial waste waters have both been successfully treated in SBR systems. The unit process involved in the SBR and conventional activated sludge systems are identical. Aeration and sedimentation/clarification are carried out in both systems. However, there is one important difference. In conventional plants, processes are carried out simultaneously in separate tanks, whereas in SBR the processes are carried out sequentially in the same tank.
Component of STP are as follows:
<table>
<tr><th>Components</th><th>quantity</th></tr>
<tr><td>SBR Basins</td><td>(33X16.5X6)M Nos. 2</td></tr>
<tr><td>Chlorination Room</td><td>(10.5X4.0X3.0)M Nos.1</td></tr>
<tr><td>Sludge sump</td><td>9.2 M DIA X3.0 M</td></tr>
<tr><td>Dosing Tank</td><td>1000 Litre (1W+1S)</td></tr>
<tr><td>Sludge Pump House</td><td>9.8M DIA X 2.5 M</td></tr>
<tr><td>Centrifuge House</td><td>(8.5 X4.5) M Nos.1</td></tr>
</table></td></tr>
<tr><td></td><td>Treatment Process at STP:
Process provides highest treatment efficiency possible in a single step biological process. The system is operated in a batch reactor mode this eliminates all the inefficiencies of the continuous processes, because filling in the basin do not allowed during aeration, settling and decanting, hence after treating one batch another batch will be take in basin. A batch reactor is a perfect reactor, which ensures 100% treatment. Four modules are provided to ensure continuous treatment. The complete process takes place in a single reactor, within which all biological treatment steps take place sequentially. No additional settling unit, secondary RUIDP - ADB Detailed Project Report For Balotra Town Waste Water System M/S Exceltech Consultancy & Projects Pvt. Ltd. VOLUME I- MAIN REPORT clarifier is required.
The complete biological operation is divided into cycles. Each cycle is of 3 – 5 hrs duration, during which all treatment steps take place. Explanation of cyclic operation:
A basic cycle comprises: (1) Fill-Aeration (F/A) + (2) Settlement (S) + (3) Decanting (D)
These phases in a sequence constitute a cycle, which is then repeated. During the period of a cycle, the liquid is filled in the Basin up to a set operating water level. Aeration Blowers are started for aeration of the effluent. After the aeration cycle, the biomass settles, No extra settling unit is required after the aeration basin.
The Cyclic Activated Sludge Process/SBR comprises the following features, 1. Biological Selector zone Ensures No Foaming And Bulking Problems 2. Oxygen Uptake Rate Control “Our” Ensures 40 - 50% POWER SAVINGS 3. Co Current Nitrification and De nitrification, Phosphorous removal this feature ENSURES more than 80% nitrogen and Phosphorous removal within the same basin without need of any external units, mixers, and recycle pumps etc. 4. decanter assembly in stainless steel ENSURES no corrosion, long equipment life, no maintenance 5. Diffusers, Blowers and Aeration grid 6. Submersible pumps for return sludge (RAS) recycle and Surplus sludge (SAS) pumps for sludge wasting reduces space requirement. no secondary clarifier is used which drastically reduces civil cost. 7. PLC unit for complete automatic cycle control and operation reduces manpower cost complete operation can be hooked to central control desk.</td></tr>
<tr><td colspan="2">Process Flow Diagram of SBR Technology based STP</td></tr>
</table>



Process Flow Diagram of Existing 9.0 MLD STP

Treatment efficiency	Normally about 60-65% treatment efficiency (BOD removal) is expected in Activated Sludge process STPs. The Expected raw sewage Characteristics Parameter are as follows pH – 6.5-7.5 COD – 600 mg/l BOD – 300 mg/l TSS – 600 mg/l TKN- 55 mg/L TP- 6 mg/L The treated effluent parameters are 18.07.2019 pH – 7.2 COD – 13.8 mg/l BOD – 5.6 mg/l TSS – 3.4 mg/l Coliform count – (per 100 ml) - 460 mg/L
Sludge management	Currently , sludge is being dried in a temporary RCC structure near the centrifugal pump. And dryied sludge is distributed to neary by farmers.
Treated wastewater (effluent disposal)	Presently water is disposed off in low laying land near STP and disposed water is used by near by farmer.

Process Flow Diagram of Existing 9.0MLD STP



Compliance with Applicable National and State Laws, Rules, and Regulations

Law, Rules, and Regulations	Description and Requirement	STP
		Y = compliant (if applicable, specify expiration date of permit/clearance) N = non-compliant36 N/A = not applicable (state justification)
EIA Notification	The EIA Notification of 2006 states that environmental clearance is required for certain defined activities/projects.	N/A Environmental clearance is not required as STPs are not listed in the EIA Notification's "Schedule of Projects Requiring Prior Environmental Clearance"
Manufacture, Storage, and Import of Hazardous Chemical Rules, 1989	Storage of chlorine (threshold quantity greater than 10 tons but less than 25 tons) in WTPs will require clearance from PESO	N/A No chlorine used or stored in the STP.
Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments	Consent to operate from RSPCB	N CTE of Existing STP is already expired in 30 June 2016 and CTO is Under Process : 2021-2022/Balotra/8721 Dated28/10/2021
Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments.	Consent to operate from RSPCB	Y Order No. 2021-2022/Balotra/8730
Environment (Protection) Act, 1986 and CPCB	Emissions and discharges from the facilities to be created, refurbished, or	N As per the CPCB and NGT guidelines , STP effluent shall meet the following

[36]Compliant = There is sufficient and appropriate evidence to demonstrate that the particular regulatory requirement has been complied with; non-compliant = clear evidence has been collected to demonstrate the particular regulatory requirement has not been complied with.

Environmental Standards	augmented shall comply with the notified standards. a. Wastewater disposal standards	disposal standards: TSS - Not to exceed 100 mg/l, pH - 6.5 to 9.0, BOD - (3 days at 27^{o}C) Not to exceed 10 mg/l, Fecal Coliform not to exceed 230 MPN/100 ml. but current treatment process is not meeting the required standards.
Noise Pollution (Regulation and Control) Rules, 2002 amended up to 2010	Applicable ambient noise standards with respect to noise for different areas/zones	Y No source of noise
National Institute of Occupational Safety and Health (NIOSH) Publication No. 2002-149	Compliance with NIOSH Guidance for Controlling Potential Risks to Workers Exposed to Class B Bio solids	N Training and proper PPEs are required
Forest (Conservation) Act, 1980 and Forest Conservation Rules, 2003 as amended	As per Rule 6, every user agency, who wants to use any forest land for non-forest purposes shall seek approval of the central government.	N/A
Ancient Monuments and Archaeological Sites and Remains Rules of 1959	No development activity is permitted in the “protected area,” and all development activities likely to damage the protected property are not permitted in the “controlled area” without prior permission of the Archaeological Survey of India (ASI). Protected property includes the site, remains, and monuments protected by ASI or the State Department of Archaeology.	N/A
The Child Labour (Prohibition and Regulation) Act, 1986	No child below 14 years of age will be employed or permitted to work in any of the occupations set forth in the Act’s Part A of the Schedule or in any workshop wherein any of the processes set forth in Part B of the Schedule are present.	Y STP is operated by contract staff. No children are engaged.

Institutional Arrangement

Parameter	STP
Operations	Continuous operation; involves, mechanical and electrical operation;
Estimated number of technical employees on-site per shift	**9.0MLD STP Plant** Chemist -: One. , Senior Chemist-: One Electrician / Instrumental technician (ITI/ Diploma in electrical) -; One ; Meachanic- ; One
Estimated number of laborers on-site per shift	
Estimated number of employees in charge of environmental management and monitoring	3
Frequency of waste water quality monitoring (raw)	Daily in house laboratory
Frequency of wastewater quality monitoring (treated)	Daily in house laboratory

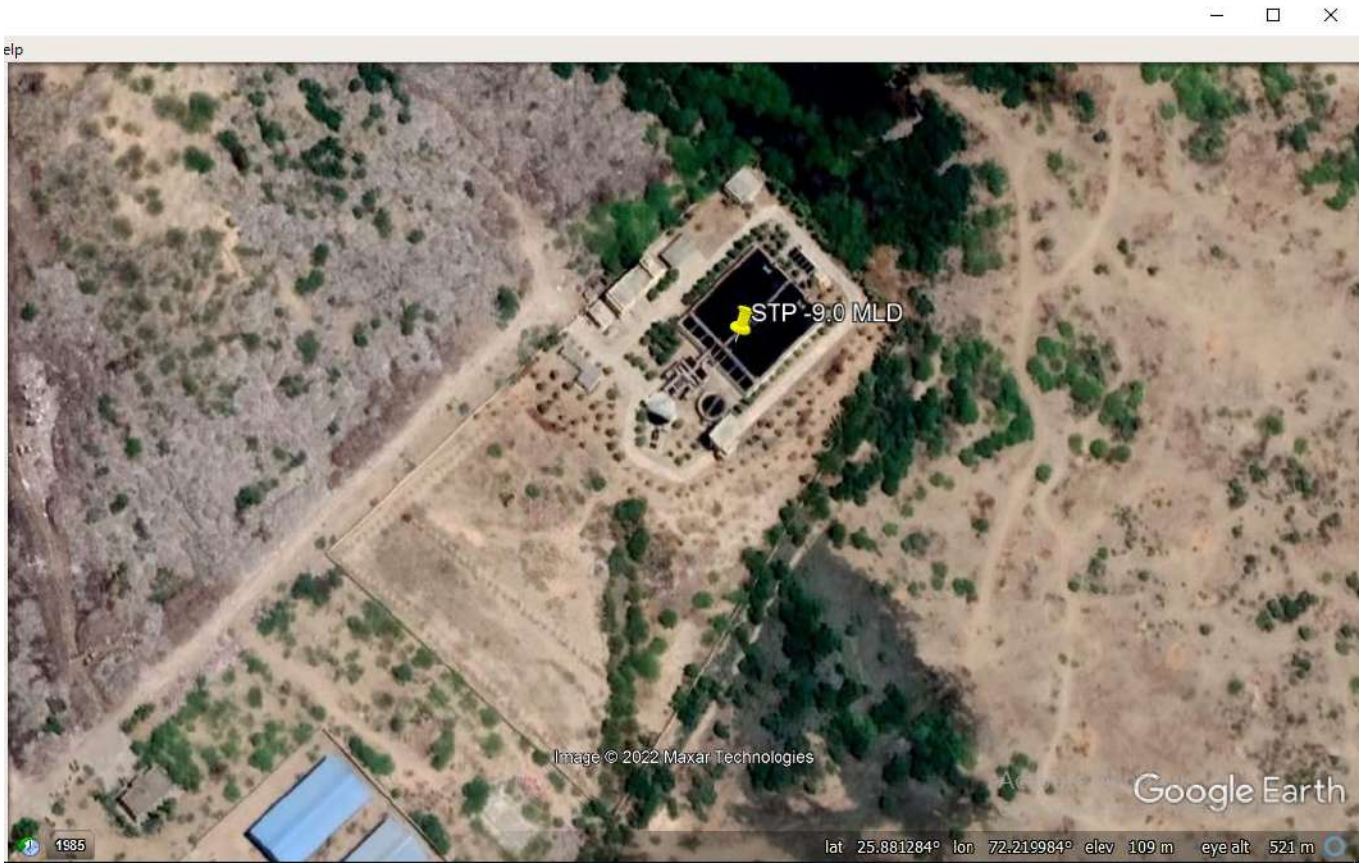


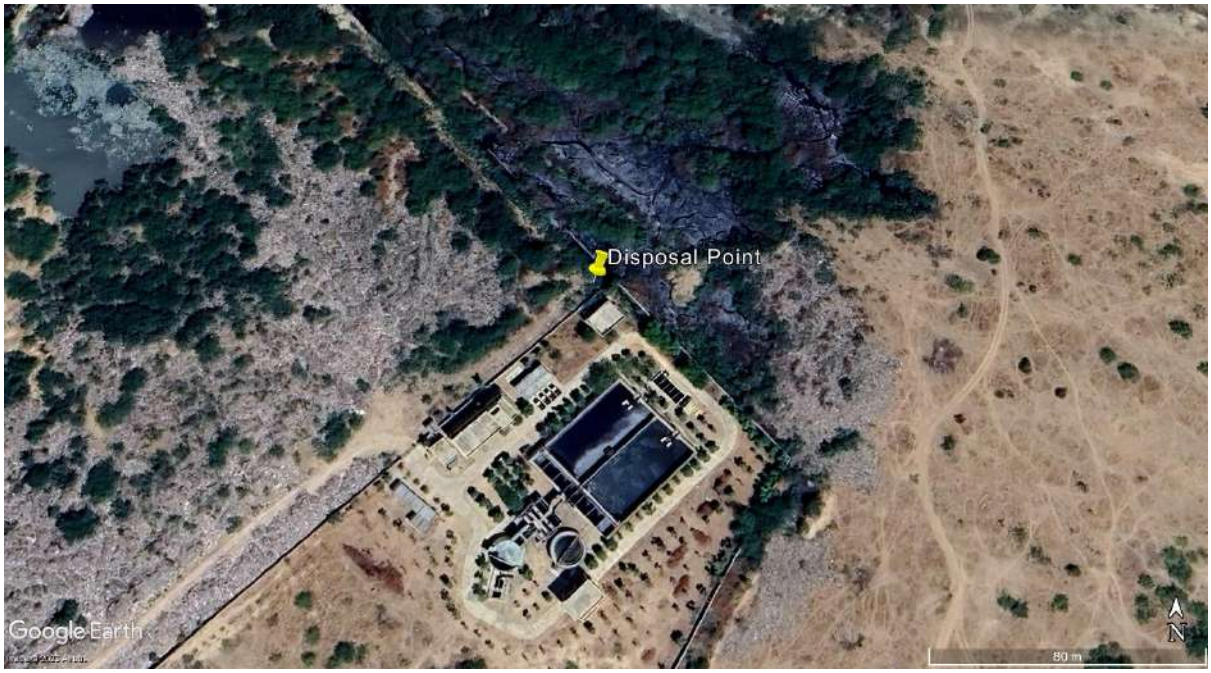
Figure 1:Google View of Existing Balotra STP: 9 MLD

. **Figure 3: Inlet Chamber, Existing Balotra 9 MLD STP**

. **Figure 4: Existing Balotra 9 MLD STP**

.

Temporary RCC structure with centrifugal pump, for dewatering and Sludge drying



Disposal point of STP Balotra

Corrective Action Plans : As presented in the above table, The STP required CTO under Water act which is already applied and under process and it will be taken before start of project. The environmental concerns are mainly related to occupational health and safety, public safety, disposal of debris, discarded materials etc.

No permanent sludge drying beds - Presently, sludge is being dried in a temporary RCC structure near the centrifugal pump. A proposal to construct a sludge drying bed in the North East corner of the existing STP is being considered by Municipal Council, Balotra with their own funds. Sufficient land is available in STP premises to construct sludge drying beds. Also it is proposed to use the dried sludge in various permissible activities, including the use as fertilizer as most of the land in STP proximity is agricultural land.
High coliform in treated water - High coliform in treated water is a serious concern as it indicates the presence of harmful bacteria and viruses that can cause various waterborne diseases. The existing Sewage Treatment Plant (STP) has been found to have higher coliform numbers in treated water, which is a clear indicator of malfunctioning of the STP.

The recently appointed operator, along with Municipal Council Balotra, is assessing the system to identify the root cause of the problem. It is likely that faulty equipment or processes are responsible for the high coliform count in treated water. The operator and Municipal Council Balotra have committed to using their own funds to change the faulty equipment or process to ensure that the STP functions effectively and produces safe, clean water.

Annexure -2 Lab testing report of STP effluent at outlet: Add Lab Testing Report

PUBLIC HEALTH ENGINEERING DEPARTMENT LABORATORY Pali (Raj.)
REPORT OF THE CHEMICAL EXAMINATION OF WATER

No.Lab/Tech./ 1256

Date: 24-7-19

To.
T A & Assistant Engineer,
PHED.
Division Pali (Raj.)

District: Barmer
Tehsil : Balotara

Reference : X.En., (Sewage Project), Municipal Council, Balotara
Letter No. Spl. 2 dated 05-07-2019

Sample Collected By:
Sh. Narendra (Project Manager)

Date of Collection: 18.07.2019 (04.00PM) Date of Receipt: 18.07.2019 Date of Exam.: 18.07.2019

Lab Sample No.		SEWAGE - 13
Source & Location		Sewage Treatment Plant Balotara
1	pH	7.2
2	Total BOD at20°C	5.6
3	Total Suspended Solids	3.4
4	Total COD	13.8
5	Coliform Count (per100 ml.)	460

Note: All results except at Sr. No. 1 to 5 are in mg /L.

24-07-19
Junior Chemist
P.H.E.D. Lab.,Pali

Date:

No. 1256 / 24-7-19
Copy:

1. Chief Chemist, PHED, Rajasthan, Jaipur (Raj.)
2. Suptd Chemist, PHED Regional Laboratory, Jodhpur (Raj.) in reference to telephonic discussion/direction held with him.

24-07-19
Junior Chemist
P.H.E.D. Lab.,Pali

Annexure 3. Copy of Consent to Establish and Consent to Operate:

A. CTE

Rajasthan State Pollution Control Board
4, Institutional Area, Jhalana Doongari, Jaipur-302 004
Phone: 0141-5159600,5159695 Fax: 0141-5159697
www.rpcb.nic.in
Registered

File No : F(MUID)/Barmer(Pachpadra)/30(1)/2014-2015/5350-5352
Order No : 2014-2015/MUID/2822 Dispatch Date: 26/09/2014

M/s Municipal Council Balotra (STP)
Tehsil:Pachpadra
District:Barmer

Sub: **Consent to Establish** under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974.

Ref: Your application(s) for Consent to Establish dated 23/07/2013 and subsequent correspondence.

Sir,

Consent to Establish under the provisions of section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 (hereinafter to be referred as the Water Act) as amended to date and rules & the orders issued thereunder ,**is hereby granted** granted for your **(STP) plant** situated / proposed at **Village- Jerla near Balotra town Tehsil:Pachpadra District:Barmer** , Rajasthan under the provisions of the said Act(s). This consent is granted on the basis of examination of the information furnished by you in consent application(s) and the documents submitted therewith, subject to the following conditions:-

1 That this Consent to Establish is valid for a period from **23/07/2013** to **30/06/2016 or date of Commencement of production / commissioning of the project or activities whichever is earlier .**

2 That this Consent is granted for manufacturing / producing following products / by products or carrying out the following activities or operation/processes or providing following services with capacities given below.

Particular	Type	Quantity / Capacity
Sewage Treatment Plant	Service	9.00 MLD

3 That in case of any increase in capacity or addition / modification / alteration or change in product mix or process or raw material or fuel the project proponent is required to obtain fresh consent to establish.

4 That the control equipment as proposed by the applicant shall be installed before trial operation is started for which prior consent to operate under the provision of the **Water Act** shall be obtained. This consent to establish shall not be treated as consent to operate.

5 That the quantity of effluent generation and disposal along with mode of disposal for the treated effluent shall be as under:

Rajasthan State Pollution Control Board
4, Institutional Area, Jhalana Doongari, Jaipur-302 004
Phone: 0141-5159600,5159695 Fax: 0141-5159697
www.rpcb.nic.in
Registered

File No : F(MUID)/Barmer(Pachpadra)/30(1)/2014-2015/5350-5352
Order No : 2014-2015/MUID/2822

Dispatch Date: 26/09/2014

Type of effluent	Max. effluent generation (KLD)	Quantity of effluent to be recycled (KLD)	Quantity of treated effluent to be disposed (KLD) and mode of disposal
Domestic Sewage	9000.000	NIL	9,000.000 On Land For Plantation/Horticulture etc

6 That the domestic sewage shall be treated before disposal so as to conform to the standards prescribed by the Board as notified under the Environment (Protection) Act-1986 for disposal **Into Inland Surface Water**. The main parameters for regular monitoring shall be as under.

Parameters	Standards
Total Suspended Solids	Not to exceed 100 mg/l
pH Value	Between 5.5 to 9.0
Oil and Grease	Not to exceed 10 mg/l
Total Residual Chlorine	Not to exceed 1.0 mg/l
Ammonical Nitrogen (as N)	Not to exceed 50 mg/l
Total Kjeldahl Nitrogen (as N)	Not to exceed 100 mg/l
Biochemical Oxygen Demand (3 days at 27°C)	Not to exceed 30 mg/l
Sulphide (as S)	Not to exceed 2.0 mg/l
Nitrate Nitrogen	Not to exceed 10 mg/l
Chlorides	Not to exceed 1000 mg/l
Boron (As B)	Not to exceed 0.2 mg/l
Chemical Oxygen Demand	Not to exceed 250 mg/l

7 That the unit shall obtain all necessary permission from concern authority & district administration, Barmer for establishment of one STP of 9.00MLD.

Rajasthan State Pollution Control Board
4, Institutional Area, Jhalana Doongari, Jaipur-302 004
Phone: 0141-5159600,5159695 Fax: 0141-5159697
www.rpcb.nic.in
Registered

File No : F(MUID)/Barmer(Pachpadra)/30(1)/2014-2015/5350-5352
Order No : 2014-2015/MUID/2822 Dispatch Date: 26/09/2014

8 That the unit shall not allow to disposed off the treated sewage in any natural nallah/stream without prior permission from competent authority or Government of Rajasthan.
9 That the unit shall install separate energy meter on the STP and maintain the record of reading and submit to the Board six monthly.
10 That the unit shall carryout sampling of treated waste water and submit the result to State Board immediately after operation of STP on full swing.
11 That the unit shall install disinfection arrangement for treated sewage before utilization of the same for agriculture, irrigation, and plantation/gardening etc.
12 That the water flow meters shall be provided at all suitable points to measure quantity of daily waste water received, waste water treated and treated waste water utilized for irrigation, plantation/gardening purposes. Daily record of the same shall be maintained and to be submitted to the Board.
13 That the entire treated sewage shall be utilized for irrigation, horticulture/plantation etc.
14 That the unit shall ensure proper utilization and reuse of domestic waste water after adequate treatment for gainful purposes.
15 That this consent to establish is being issued for establishment of one STP of 9.00MLD at Village- Jelra, Tehsil- Balotra, District – Barmer proposed by M/s M/s Executive Engineer, Nagraparisad, Balotra only. For any change in capacity, the unit has to seek fresh consent to establish.
16 That if the project cost exceeds Rs.11.19 Crores, the unit shall take/obtain modification in consent to establish after paying fee as applicable.
17 That the unit shall not allow discharging the treated domestic waste water into any stream/Nallah which is ultimately terminating into any water body used for drinking purposes.
18 That the unit shall undertake spray of insecticides time to time to control fly/mosquito growth in the area.
19 That the unit shall undertake plantation in two rows of suitable species all along the periphery of the site of the STP to control foul smell.
20 That the unit shall install adequately designed rain water harvesting structure for prevention and recharge of ground water in and around the area.
21 That the unit shall not allow to install any D.G.Set under this consent to operate without prior permission under the Air Act 1981 from the Board.
22 That the unit shall dispose the sludge of STP in scientific manner.
23 That the unit shall not allow making any obstacles to any natural water flow i.e. natural nallah/stream carrying rain water to any water body.
24 That the unit shall ensure no treated/untreated sewage entering into Lakes/water bodies existing in nearby area.
25 That the unit shall provide proper drainage system for collection of grey sewage & other effluent generated in the catchment area of the STP.

Rajasthan State Pollution Control Board
4, Institutional Area, Jhalana Doongari, Jaipur-302 004
Phone: 0141-5159600,5159695 Fax: 0141-5159697
www.rpcb.nic.in
Registered

File No : F(MUID)/Barmer(Pachpadra)/30(1)/2014-2015/5350-5352
Order No : 2014-2015/MUID/2822

Dispatch Date: 26/09/2014

26 That the unit shall take adequate measures to prevent accumulation/cess pooling of untreated/treated sewage within and outside the premises to avoid any adverse impact on inhabitants of nearby areas.

27 That this consent to establish shall be subject to compliance of any direction or order passed by Court of Law in the matter.

28 That the unit shall provide the Oil & Grease trap in good condition, so that oil & grease coming with waste water will retained in the trap

29 That, not withstanding anything provided hereinabove, the State Board shall have power and reserves its right, as contained **section 27(2) of the Water Act** to review anyone or all the conditions imposed here in above and to make such variation as it deemed fit for the purpose of compliance of the **Water Act.**

30 That the grant of this **Consent to Establish** is issued from the environmental angle only, and does not absolve the project proponent from the other statutory obligations prescribed under any other law or any other instrument in force. The sole and complete responsibility, to comply with the conditions laid down in all other laws for the time-being in force, rests with the industry/ unit/ project proponent.

31 That the grant of this **Consent to Establish** shall not, in any way, adversely affect or jeopardize the legal proceedings, if any, instituted in the past or that could be instituted against you by the State Board for violation of the provisions of the Act or the Rules made thereunder.

This **Consent to Establish** shall also be subject, beside the aforesaid specific conditions, to the general conditions given in the enclosed Annexure. The project proponent will comply with the provisions of the **Water Act** and to such other conditions as may, from time to time, be specified by the State Board under the provisions of the aforesaid Act(s). Please note that, non compliance of any of the above stated conditions would tantamount to revocation of **Consent to Establish** and project proponent / occupier shall be liable for legal action under the the relevant provisions of the said Act(s).

This bears the approval of the competent authority.

Yours Sincerely

Group Incharge

Rajasthan State Pollution Control Board
4, Institutional Area, Jhalana Doongari, Jaipur-302 004
Phone: 0141-5159600,5159695 Fax: 0141-5159697
www.rpcb.nic.in

Registered

File No : F(MUID)/Barmer(Pachpadra)/30(1)/2014-2015/5350-5352
Order No : 2014-2015/MUID/2822

Dispatch Date: 26/09/2014

Copy To:-

1 Regional Officer, Regional Office, Rajasthan State Pollution Control Board, Balotra requested to inspect the unit for verification of compliance of CTE conditions and forward the inspection report to HO for further action within 09 month.
2 Master File.

Group Incharge

B. CTO Under Air Act :

Regional Office Balotra

Rajasthan State Pollution Control Board

Regional office,Rajasthan state pollution control Board,Jasol phanta,Opp.JDVVNL office,Jasol Road Balotra,District -Barmer.

Registered

D9set
AIR
CTO

File No : F(Tech)/Barmer(Pachpadra)/6991(1)/2021-2022/1158-1159
Order No : 2021-2022/Balotra/8730
Date: 29/10/2021
Unit Id : 105277

M/s COMMISSIONER MUNICIPAL COUNCIL BALOTRA
Village Jerla,BALOTRA Dist Barmer 344022 , JerlaBalotra
Tehsil:Pachpadra
District:Barmer

Sub: Consent to Operate under section 21(4) of the Air (Prevention & Control of Pollution) Act, 1981.

Ref: Your application for Consent to Operate dated 18/03/2020 and subsequent correspondence.

Sir,

Consent to Operate under the provisions of section 21/(4) of the Air (Prevention & Control of Pollution) Act, 1981, (hereinafter to be referred as the Air Act) as amended to date and rules & the orders issued thereunder **is hereby granted** for your **Sewage Treatment Plant plant** situated at **Village Jerla,BALOTRA Dist Barmer 344022 Jerla Balotra Tehsil:Pachpadra District:Barmer**, Rajasthan, subject to the following conditions:-

1 That this Consent to Operate is valid for a period from **18/03/2020** to **28/02/2030**.

2 That this Consent is granted for manufacturing / producing following products / by products or carrying out the following activities or operation/processes or providing following services with capacities given below.

Particular	Type	Quantity with Unit
D.G.Set	Activity	200.00 KVA

3 That this consent to operate is for existing plant, process & capacity and separate consent to establish/operate is required to be taken for any addition / modification / alteration in process or change in capacity or change in fuel.

4 That the sources of air emmissions along with pollution control measures and the emission standards for the prescribed parameters shall be as under:

Sources of Air Emmissions	Pollution Control Measures	Prescribed	
		Parameter	Standard
D.G. Set(200KVA)	ACOUSTIC ENCLOSURE	--	--

Signature valid
Digitally signed by Ramkumar Sehra
Date: 2021.10.29 16:30:25 IST
Reason: SelfAttested
Location:

Regional Office Balotra

Rajasthan State Pollution Control Board

Regional office,Rajasthan state pollution control Board,Jasol phanta,Opp.JDVVNL office,Jasol Road Balotra,District -Barmer.

Registered

File No : F(Tech)/Barmer(Pachpadra)/6991(1)/2021-2022/1158-1159
Order No : 2021-2022/Balotra/8730

Unit Id : 105277 Date: 29/10/2021

5 That this consent to operate is for operation of D.G. Set of capacity 200 KVA only.

6 That proponent shall comply with the provisions of the Air Act, 1981 and shall comply with the prescribed standards.

7 That proponent shall provide an adequate stack height with D.G. Set and shall be acoustically enclosed.

8 That, not withstanding anything provided hereinabove, the State Board shall have power and reserves its right, as contained under section 21(6) of the Air Act to review anyone or all the conditions imposed here in above and to make such variation as it deemed fit for the purpose of Air Act.

9 That the grant of this **Consent to Operate** is issued from the environmental angle only, and does not absolve the project proponent from the other statutory obligations prescribed under any other law or any other instrument in force. The sole and complete responsibility to comply with the conditions laid down in all other laws for the time-being in force, rests with the industry/ unit/ project proponent.

10 That the grant of this **Consent to Operate** shall not, in any way, adversely affect or jeopardize the legal proceeding, if any, instituted in the past or that could be instituted againt you by the State Board for violation of the provisions of the Act or the Rules made thereunder.

This **Consent to Operate** shall also be subject, besides the aforesaid specific conditions, to the general conditions given in the enclosed Annexure. The project proponent will comply with the provisions of the Air Act and to such other conditions as may, from time to time , be specified, by the State Board under the provisions of the aforesaid Act(s). Please note that, non compliance of any of the above stated conditions would tantamount to revocation of **Consent to Operate** and project proponent / occupier shall be liable for legal action under the relevant provisions of the said Act(s).

Yours Sincerely

Regional Officer[Balotra]

(A): Copy To:-
1 Master File.

Signature valid
Digitally signed by [illegible]kumar Sehra
Date: 2021.10.29 [illegible]:30:25 IST
Reason: Self Attested
Location:

C. CTO Under Water Act : Under Process :

Rajasthan State Pollution Control Board
FORM XIII
Application for Consent to Operate under section 25/26 of the Water (Prevention and Control of Pollution) Act, 1974
Print Date: 3/31/2022

NEW APPLICATION FORM

Date: 31/03/2022

Unit ID: 55973

Application ID: 307185

Application Type: CTO WATER - Fresh

Disposing Authority: Head Office [Liquid Waste]

Address: No

Council Balotra (STP) Barmer

Secretary4, Institutional Area, Jhalana Doongari, Jaipur-302 004Phone: 2716852

hereby apply for obtaining

Consent, in Form XIII, under section 25/ 26 of the Water (Prevention and Control of Pollution) Act, 1974 (No. 6 of 1974) for Consent to Operate for bringing into use or to continue to use any new/ altered outlet or for discharge of sewage/ trade effluent or to continue to discharge sewage/ trade effluent or discharge of sewage/ trade effluent on land/ premises owned by Municipal Council Balotra (STP) (Name of Director/ proprietor/ partner etc.)

Part I: General Informationn

A. Details of Industry/ Activity/ Service/ Operation/ Process:-

a.	Name of Industry/ Activity/ Service/ Operation/ Process	Municipal Council Balotra (STP)
b.	Name and Designation of the Applicant	Shivpal Singh Commissior
c.	Correspondence Address	
	Village/ Area	
	Street/ Locality/ City	
	Tehsil	Pachpadra
	District	Barmer
	State	Rajasthan
	Pin Code	
	Telephone No. (including STD Code)	0-
	Mobile No.	N/A
	E-Mail Address	
	Fax No.	0-
d.	Site Address	(STP) Village- Jerla near Balotra town
	Village/ Area	BALOTRA
	Street/ Locality/ City	BALOTRA
	Tehsil	Barmer
	District	Pachpadra
	Plot No./ Khasra No.	
	Pin Code	344022
	Telephone No. (including STD Code)	0-
	Mobile No.	8946970901
	Fax No.	0-
	Email Address	mbbalotra@yahoo.co.in
e.	Plot Area/ Mining Lease Area	N/A
f.	Land classification	
	(a) Industrial or	No
	(b) Commercial, or	No
	(c) Agriculture, or	No
	(d) Residential, or	No
	(e) Other than above	No
g.	Whether covered under Aravalli Notification	
h.	Whether requiring authorization under the rules dealing	

Corrective Action Plan: As presented in the above table, there is a regulatory non-compliance related to CTO under water act and The CTO under Water act has not issued, so it is must take CTO under water act. The environmental concerns are mainly related to occupational health and safety, public safety, disposal ofdebris, discarded materials etc.

कार्यालय अधीक्षण अभियन्ता जन स्वा. अभि. विभाग वृत बाड़मेर

Phone No. 02982- 220253
E mail : edphed@gmail.com

क्रमांक : जनस्वा / बाड़. / अंके.बालोतरा / 2021–22 / 12855 दिनांक 11/3/2022

मैसर्स भगवती बिल्डर्स
सुभाष चौक बाड़मेर
मोबाईल नं. 9414106411

विषय : Construction and Commissioning of OHSR For UWSS Balotra.
प्रसंग: आपकी निविदा दिनांक 09.02.2022 (निविदा सूचना सं 2021–22 / 98)

उपरोक्त विषयान्तर्गत उक्त कार्य हेतु आपकी फर्म द्वारा प्रस्तुत की गई दरें न्यूनतम होने की स्थिति में उक्त कार्य का निविदा प्रकरण आपकी फर्म के पक्ष में जी सारणी दरों से 17.21 प्रतिशत कम में निम्नांकित विभागीय शर्तो पर अनुमोदित किया जाता हैं।

S.No.	Particilars	"G" Schedule Amount As Per BOQ	Approved Rate	
			Tender Premium	Approved Amount
1	Construction and Commissioning of OHSR For UWSS Balotra.	10537890.00	17.21% Below	8724319.13

विभागीय शर्ते

1- The work should be got executed strictly as per provision of A&F, TS and budget allotment.
2- No extra /excess work is to be done without prior permission of competent authority..
3- The Time period for Completion of above work is 9 Months
4- The contract shall be governed by all the terms & conditions as mentianed in Tender documents.
5- प्रमुख शासन सचिव, जन स्वा. अभि. विभाग, राज. जयपुर द्वारा दिये गये निर्देशो की पालना में प्रत्येक जलाश्य की जीयो टेकिंग कर इससे s डिजिट में प्राप्त कोड का इन्दाज माप पुस्तिका मे करने के पश्चात् भुगतान की कार्यवाही की जावे।
6- 10 दिवस के भीतर–भीतर इस कार्यालय में उपस्थित होकर वित्त विभाग के नोटिफिकेशन दिनांक 12.10.2021 के अनुसार अतिरिक्त निष्पादन सुरक्षा राशि (APS) रू.116450/– (अक्षरे रू. एक लाख सोलह हजार चार सौ पचास मात्र) जमा करावें, तत्पश्चात् राशि रू.13100/– के नॉन ज्युडिशियल स्टॉम्प पेपर सहित अनुबन्ध निष्पादन करने की कार्यवाही करें।

संलग्नः बी.ओ.क्यु.

अरतसिंह
अधीक्षण अभियन्ता
जन स्वा. अभि. विभाग, वृत बाड़मेर

क्रमांक : जनस्वा / बाड़. / अंके.बालोतरा / 2021–22 / 12856-57 दिनांक 11/3/2022

प्रतिलिपिः– निम्नलिखित को सूचनार्थ एंव आवश्यक कार्यवाही हेतु

1– अतिरिक्त मुख्य अभियन्ता, जन स्वा. अभि. विभाग, क्षेत्र द्वितीय जोधपुर।
2– अधिशाषी अभियनता, जन स्वा. अभि. विभाग, खण्ड बालोतरा को मूल निविदा प्रकरण भिजवाते हुए लेख हैं कि फर्म द्वारा इस कार्यालय में अनुबन्ध निष्पादित करने की सूचना पश्चात् निविदा प्रपत्र में वर्णित शर्तो एंव विशिष्टियों के अनुसार कार्य करवाया जाना सुनिश्चित करावें।
(संलग्नः– निविदा प्रकारण)

अधीक्षण अभियन्ता
जन स्वा. अभि. विभाग, वृत बाड़मेर

Appendix 4: Stakeholders and Pubic Consultation Consultations Conducted During Project Preparation

A. Stakeholders Consultations in CLC:

City level Stakeholder Committee (CLC) Meeting (dtd. 13.01.2022)- A town-level stakeholder consultation meeting was conducted to discuss various issues like land availability, scope of works etc. under the chairmanship of District Collector in which representatives of Member of Legislative Assembly of Rajasthan from Pachpadra, primary and secondary stakeholders were invited. The feedback and concerns of the stakeholders have taken into consideration in detail designs of the project. City level Committee meeting was held on under the Chairmanship of District Collector, Barmer for finalization of works of Water Supply and Sewerage in Balotra Town. Proposed works were approved by CLC members in this meeting. Minutes of Meeting of CLC vide dated are given below:

Photos: CLC Meeting held on 13.01.2022

Minutes of CLC meeting with Outcomes

क्रमांक :– प्र40() सामान्य/2022/680-98 दिनांक :–13/1/22

प्रतिलिपी निम्न को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित है:–

1. माननीय सांसद महोदय, संसदीय क्षेत्र बाडमेर।
2. माननीय विधायक महोदय, विधानसभा क्षेत्र पचपदरा
3. श्रीमान् जिला कलक्टर ,बाडमेर।
4. श्रीमान् परियोजना निदेशक,आरयूआईडीपी,जयपुर।
5. माननीय सभापति महोदया,नगरपरिषद,बालोतरा।
6. माननीय उपसभापति महोदय,नगरपरिषद,बालोतरा।
7. श्रीमान् मुख्य अभियन्ता,आरयूआईडीपी,जयपुर।
8. श्रीमान् अतिरिक्त मुख्य अभियन्ता,आरयूआईडीपी,जोन जोधपुर।
9. श्रीमान् अधीक्षण अभियन्ता,जन.स्वा.अभि.विभाग,बाडमेर।
10. श्रीमान् अधीक्षण अभियन्ता,सा.नि.विभाग,बाडमेर।
11. आयुक्त नगरपरिषद, बालोतरा।
12. अधिशाषी अभियन्ता,जन.स्वा.अभि.विभाग,बालोतरा।
13. अधिशाषी अभियन्ता,नगरपरिषद, बालोतरा।
14. उच्चाधिकारी नगरनियोजन विभाग,जोधपुर।
15. अधिशाषी अभियन्ता,आरयूआईडीपी,आबूरोड।
16. टीम लीडर, सीएमएससी –2, जोधुपर।
17. स्थानीय स्वयं सेवी संस्था के प्रतिनिधि
18. मैसर्स एक्सलटैक,जयपुर।

अधिशाषी अभियन्ता आरयूआईडीपी एवं
सदस्य सचिव सिटी लेवल कमेटी,बाडमेर

करान का माग का गइ ।

श्रीमान् अधीक्षण अभियन्ता, जन.स्वा.अभि. विभाग,बाडमेर द्वारा सुझाय दिया गया कि बालोतरा शहर के लिये एक दिन का पानी के भण्डारण हेतु कम से कम 12 एमएल का सीडब्लूआर विभाग से विचार विमर्श कर बनाया जाये ।

माननीय अध्यक्ष एवं कमेटी के सदस्यो द्वारा उपरोक्त सभी सुझावों पर सहमति प्रदान की गई तथा अध्यक्ष महोदय द्वारा निर्देशित किया गया कि डीपीआर में आवश्यक संसोधन करते हुये जल्द से जल्द अग्रिम कार्यवाही हेतु भेजा जावें।

कलेक्ट्रेट सभागार कक्ष बाडमेर में बैठक सध्न्यवाद सम्पन हुई।

जिला कलक्टर एवं अध्यक्ष
सिटी लेवल कमेटी,बाडमेर

Transcript

City Level Committee Meeting- A stakeholder consultation meeting (City Level Committee) was conducted on 13.01.2022 for Balotra Town under the Chairmanship of District collector. In the meeting officials of PHED, RUIDP, Municipal Board, Water Resource Department and other invitees were present. A detail discussion was made on following project components; pipeline for drinking water distribution network and sewer collection network, rehabilitation of existing clear water reservoirs (CWRs), overhead service reservoirs (OHSRs) and Pump house and allied works under this scheme was discussed.

CLC meeting Attendance Sheet

ATTENDANCE SHEET

Date:-13.01.2022

CITY LEVEL COMMITTEE MEETING FOR BALOTRA SEWER AND WATER SUPPLY PROJECT UNDER RUIDP PHASE-IV

S.No.	Name	Signature
1	श्रीमान् कलेक्टर महोदय बाड़मेर	
2	श्रीमान् विधायक महोदय पचपदरा	
3	सुफिया जैन	अधिशासी अभियन्ता बालोतरा
4	Bhanwar Singh Semlot	
5	Deepak Maurya Exen. RUIDP.	
6	Sunil Kumar JE RUIDP	
7	Upendra Gour SCE, RUIDP	
8	J. P. Gupta Exen PHED BM	
9	मेहबूब खां मिरासी	नेता प्रतिपक्ष
10	Yogesh Kumawat	Ex- NP Balotra
11	नैनाराम खुंटेटा	उपखण्ड अधिकारी बालोतरा
12	हनुमान पालीवाल	जाई पार्षद नगर परिषद बालोतरा
13	Dashrath Balawat	Excellech Consultancy (DPR Consultant)

B. Consultations during Social and Environmental Impact Assessment

Various consultations were done during social and environmental impact assessment of the project with residents of the town at various locations to understand their level of satisfaction about the present water supply and sewerage conditions in town and also to understand their awareness about the proposed works and their willingness/acceptance of the proposed works under RUSTDIP. Details of these consultations are given below-

Table : Details of Public Consultations in Balotra

Date & Area	Participants			Location	Issues Discussed	Outcome
	Male	Female	Total			
July 22nd , 22.07.2022	12	0	12	Shastri Chowk Petrol Pump Ke Pass Balotra	• Project components under RSTDSP and the benefits to the Community. • Grievance redressal mechanism under the project. • Present Status of Water Supply and Waste Water services in town and other concerned issues and challenges. • Presence of any forest, wild life or any sensitive / unique environmental components nearby the project, • Presence of historical/ cultural/ religious sites nearby. • Willingness to Reuse the STP treated water. • Unfavourable climatic condition • Status of land and present vegetation at proposed land, reuse of treated effluent from STP	• Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. Grievance mechanism and process of loading complaints briefed with participants. • It was also informed by habitations that water supply is being provided by PHED but it's intermittent on alternate days and quality of water is also not good. Sewerage facility is not available in the town; most of households having their own Septic tanks or soak pits. • No wildlife present at nea r subproject sites • Participants are happy with proposed project. • There is not any forest, wildlife or any sensitive /unique environmental, component near the project area. • There are not any historical/cultural and religious sites in nearby the subproject area.
July 22nd , 22.07.2022	11	01	12	Shastri Chowk, Balotra	• Project components under RSTDSP and the benefits to the Community. • Process of logging grievance and its mechanism under the project. • Present status and access of Waste Water facilities in the town and other concerned issues and challenges. • Dust and noise pollution and disturbances during construction work. • Perception of villagers on tree felling and afforestation • Safety of residents during construction	• Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. • Process of grievance mechanism was also briefed with participants for lodging complaints. • Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. • Participants are happy with proposed project in the town. • Contractor should use modern machinery and water sprinkler to

					phase and applying of vehicle for construction activities. .	control dust and noise during construction phase. All the pollution control measures will be adopted at site to control the fugitive emission in the area and for control of noise, PPE's will be provided to workers such as ear muff etc. • Plantation activities provide shade, shelter and enhance the local biodiversity in the area. • The contractor should take care of the safety arrangement during construction phase and should provide traffic diversion routes to avoid the vehicle congestion • People should be made aware before start of work in particular area.
July 22nd , 22.07.2022	06	0	06	Gor Ka Chowk, Balotra	• Project components under RSTDSP and the benefits to the Community. • Process of logging grievance and its mechanism under the project. • Present status and access of Waste Water facilities in the town and other concerned issues and challenges. • Dust and noise pollution and disturbances during construction work. • Perception of villagers on tree felling and afforestation • Safety of residents during construction phase and applying of vehicle for construction activities. .	• Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. • Process of grievance mechanism was also briefed with participants for lodging complaints. • Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. • Participants are happy with proposed project in the town. • Contractor should use modern machinery and water sprinkler to control dust and noise during construction phase. All the pollution control measures will be adopted at site to control the fugitive emission in the area and for control of noise, PPE's will be provided to workers such as ear muff etc. • Plantation activities provide shade, shelter and enhance the local biodiversity in the area. • The contractor should take care of the safety arrangement during construction phase and should provide traffic diversion routes to avoid the vehicle congestion • People should be made aware before start of work in particular area.

July 22nd , 22.07.2022	08	01	09	Raillway Station ke paas, Balotra	• Project components under RSTDSP and the benefits to the Community. • Process of logging grievance and its mechanism under the project. • Present status and access of Waste Water facilities in the town and other concerned issues and challenges. • Dust and noise pollution and disturbances during construction work. • Perception of villagers on tree felling and afforestation • Safety of residents during construction phase and applying of vehicle for construction activities. .	• Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. • Process of grievance mechanism was also briefed with participants for lodging complaints. • Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. • Participants are happy with proposed project in the town. • Contractor should use modern machinery and water sprinkler to control dust and noise during construction phase. All the pollution control measures will be adopted at site to control the fugitive emission in the area and for control of noise, PPE's will be provided to workers such as ear muff etc. • Plantation activities provide shade, shelter and enhance the local biodiversity in the area. • The contractor should take care of the safety arrangement during construction phase and should provide traffic diversion routes to avoid the vehicle congestion • People should be made aware before start of work in particular area.
July 22nd , 22.07.2022	04	0	04	Nagar Parishad Ke Pass, Balotra	• Project components under RSTDSP and the benefits to the Community. • Process of logging grievance and its mechanism under the project. • Present status and access of Waste Water facilities in the town and other concerned issues and challenges. • Dust and noise pollution and disturbances during construction work.	• Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. • Process of grievance mechanism was also briefed with participants for lodging complaints. • Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households.

					• Perception of villagers on tree felling and afforestation • Safety of residents during construction phase and applying of vehicle for construction activities. .	• Participants are happy with proposed project in the town. • Contractor should use modern machinery and water sprinkler to control dust and noise during construction phase. All the pollution control measures will be adopted at site to control the fugitive emission in the area and for control of noise, PPE's will be provided to workers such as ear muff etc. • Plantation activities provide shade, shelter and enhance the local biodiversity in the area. • The contractor should take care of the safety arrangement during construction phase and should provide traffic diversion routes to avoid the vehicle congestion • People should be made aware before start of work in particular area.
September 14th, 2022	0	08	08	Ward 17, Balotra	• Project components under RSTDSP and the benefits to the Community. • Process of logging grievance and its mechanism under the project. • Present status and access of Waste Water facilities in the town and other concerned issues and challenges. • Dust and noise pollution and disturbances during construction work. • Perception of villagers on tree felling and afforestation • Safety of residents during construction phase and applying of vehicle for construction activities. .	• Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. • Process of grievance mechanism was also briefed with participants for lodging complaints. • Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. • Participants are happy with proposed project in the town. • Contractor should use modern machinery and water sprinkler to control dust and noise during construction phase. All the pollution control measures will be adopted at site to control the fugitive emission in the area and for control of noise, PPE's will be provided to workers such as ear muff etc. • Plantation activities provide shade, shelter and enhance the local biodiversity in the area. • The contractor should take care of the safety arrangement during construction phase and should

						provide traffic diversion routes to avoid the vehicle congestion • People should be made aware before start of work in particular area.
September 14th, 2022	0	05	05	Ward 36 Balotra	• Project components under RSTDSP and the benefits to the Community. • Process of logging grievance and its mechanism under the project. • Present status and access of Waste Water facilities in the town and other concerned issues and challenges. • Dust and noise pollution and disturbances during construction work. • Perception of villagers on tree felling and afforestation • Safety of residents during construction phase and applying of vehicle for construction activities. .	• Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. • Process of grievance mechanism was also briefed with participants for lodging complaints. • Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. • Participants are happy with proposed project in the town. • Contractor should use modern machinery and water sprinkler to control dust and noise during construction phase. All the pollution control measures will be adopted at site to control the fugitive emission in the area and for control of noise, PPE's will be provided to workers such as ear muff etc. • Plantation activities provide shade, shelter and enhance the local biodiversity in the area. • The contractor should take care of the safety arrangement during construction phase and should provide traffic diversion routes to avoid the vehicle congestion • People should be made aware before start of work in particular area.
September 14th, 2022	06	10	16	Ward 39 Balotra	• Project components under RSTDSP and the benefits to the Community. • Process of logging grievance and its mechanism under the project. • Present status and access of Waste Water facilities in the town and other concerned issues and challenges.	• Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. • Process of grievance mechanism was also briefed with participants for lodging complaints.

					• Dust and noise pollution and disturbances during construction work. • Perception of villagers on tree felling and afforestation • Safety of residents during construction phase and applying of vehicle for construction activities. .	• Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. • Participants are happy with proposed project in the town. • Contractor should use modern machinery and water sprinkler to control dust and noise during construction phase. All the pollution control measures will be adopted at site to control the fugitive emission in the area and for control of noise, PPE's will be provided to workers such as ear muff etc. • Plantation activities provide shade, shelter and enhance the local biodiversity in the area. • The contractor should take care of the safety arrangement during construction phase and should provide traffic diversion routes to avoid the vehicle congestion • People should be made aware before start of work in particular area.
September 14th, 2022	11	0	11	Ward 38 Balotra	• Project components under RSTDSP and the benefits to the Community. • Process of logging grievance and its mechanism under the project. • Present status and access of Waste Water facilities in the town and other concerned issues and challenges. • Dust and noise pollution and disturbances during construction work. • Perception of villagers on tree felling and afforestation • Safety of residents during construction phase and applying of vehicle for construction activities. .	• Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. • Process of grievance mechanism was also briefed with participants for lodging complaints. • Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. • Participants are happy with proposed project in the town. • Contractor should use modern machinery and water sprinkler to control dust and noise during construction phase. All the pollution control measures will be adopted at site to control the fugitive emission in the area and for control of noise, PPE's will be provided to workers such as ear muff etc.

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Stakeholder Consultation in Balotra

Date & Area	Participants			Location	Issues Discussed	Outcome
	Male	Female	Total			
September 14th, 2022	04	06	10	Meeting Hall, Nagar Parishad, Balotra	• Project components under RSTDSP and the benefits to the Community. • Process of logging grievance and its mechanism under the project. • Present status and access of Waste Water facilities in the town and other concerned issues and challenges. • Dust and noise pollution and disturbances during construction work. • Perception of villagers on tree felling and afforestation • Safety of residents during construction phase and applying of vehicle for construction activities. .	• Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. • Process of grievance mechanism was also briefed with participants for lodging complaints. • Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. • Participants are happy with proposed project in the town. • Contractor should use modern machinery and water sprinkler to control dust and noise during construction phase. All the pollution control measures will be adopted at site to control the fugitive emission in the area and for control of noise, PPE's will be provided to workers such as ear muff etc. • Plantation activities provide shade, shelter and enhance the local biodiversity in the area. • The contractor should take care of the safety arrangement during construction phase and should provide traffic diversion routes to avoid the vehicle congestion • People should be made aware before start of work in particular area.

Photographs of Public Consultations in Balotra

	
Public Consultation with nearby local residents at Shastri Chowk Petrol Pump Ke Pass Balotra	**Public Consultation with nearby local residents at Shastri Chowk Balotra**
	
Public Consultation with nearby local residents at Gor Ka Chowk, Balotra	**Public Consultation with nearby local residents at Nagar Parishad Ke Pass, Balotra**
	
Public Consultation with nearby local residents at Raillway Station ke paas, Balotra	**Public Consultation with nearby local residents at Raillway Station ke paas, Balotra**

Public Consultation with nearby local residents at Ward no. 17, Balotra

Public Consultation with nearby local residents at Ward no. 36, Balotra

Public Consultation with nearby local residents at Ward no. 39, Balotra

Public Consultation with nearby local residents at Ward no. 38, Balotra

Stakeholder Consultations in Balotra

Attendance sheets of Public Consultation at Balotra

Photo No. 7

PUBLIC CONSULTATION SIGNATURE SHEET

Project name: Rajasthan Secondary Towns Development Sector Project (RSTDSP) - Balotra Water Supply and Sewerage Subproject, District - Barmer, Rajasthan

Date - 14.09.2022 Note:- Stakeholder Consultation **Time:** 2:05 PM

Place: Balotra Nagar Palishad - Meeting Hall.

S.No.	Name of Participant	Occupation	Address	Signature	Phone Number
1.	SUMITRADEVI JAIN	CHAIR PERSON	Nagar Parishad BALOTRA		8000181212 9414108581
2.	SHOBA BHIL	Nagar Parshad	Ward No. 38 Balotra.		9001114964
3.	Ghewarchand Bhil	"	Ward No. 39 Balotra.		7023533727
4.	Poonmidevi Dangi	"	Ward No. 42. Balotra.		9413879517
5.	Govindram Jingar.	"	Ward No. 25 Balotra.		9414326997
6.	Indira Bajjara.	"	Ward No. 44. Balotra.		6350176333
7.	Sampatraj Dhori	"	Ward No 17 Balotra.		9829154926 87690 32899
8.	Durgadevi Meghwal	"	Ward No. 41 Balotra.	Durga	9414530773 7014681985
9.	Sanvalaram Bhati	"	Ward No 24 Balotra.		9667244047 7976067801
10.	Mamta Regar	"	Ward No 6. Balotra.	-	8890994220 8094174210
11.					
12.					
13.					
14.					

Attendance sheet: Stakeholder Consultation at Meeting Hall, Nagar parishad, Balotra

Photo-2

PUBLIC CONSULTATION SIGNATURE SHEET

Project name: Rajasthan Secondary Towns Development Sector Project (RSTDSP) - Balotra Water Supply and Sewerage Subproject, District - Barmer, Rajasthan

Date - 14.09.2022 **Time:**

Place: Ward No. 17 (22)

S.No.	Name of Participant	Occupation	Address	Signature	Phone Number
1.	Kavi Devi	Ex. Parsad	Ward No. 17		91[illegible]63511163
2.	Manju Devi	House Wife	W. N. 17		-
3.	Pushpa Devi	"	W. N. 17		6350079721
4.	Sunit Devi	AWW	W. N. 17	Sunita	9587364888
5.	Tapshya	Student B.Sc.	W. N. 17		9521747389
6.	Mamta Devi	Nagar Parishad Employee	W. N. 17		8763607275
7.	Madhu	House Wife	W. N. 17	-	9660701913
8.	Mamta	"	"		6375080853
9.					
10.					
11.					
12.					
13.					
14.					

Attendance Sheet: Public Consultation of Ward No. 17 at Balotra

Photo 3

PUBLIC CONSULTATION SIGNATURE SHEET

Project name: Rajasthan Secondary Towns Development Sector Project (RSTDSP) - Balotra Water Supply and Sewerage Subproject, District - Barmer, Rajasthan

Date 14.09.2022 **Time:**

Place:

S.No.	Name of Participant	Occupation	Address	Signature	Phone Number
1.	Pramila	House Wife	Ward No 36	Pramila	8079099281
2.	Sangeeta Devi	"	36	Sangeeta	9414972177
3.	Soni Devi	"	Ward No 36	Soni Devi	9588815424
4.	Savi Jain	"	Ward No 36	Savi Jain	6377401064
5.	Rekha	"	"	Rekha Devi	9799659136
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					

Attendance Sheet: Public Consultation of ward no. 36 at Balotra

Ward No. 36

PUBLIC CONSULTATION SIGNATURE SHEET

Project name: Rajasthan Secondary Towns Development Sector Project (RSTDSP) - Balotra Water Supply and Sewerage Subproject, District - Barmer, Rajasthan

Date 14.09.2022 **Time:** 6:45

Place: Ward No 39

S.No.	Name of Participant	Occupation	Address	Signature	Phone Number
1.	Kanchhoo Ram	Business (Shopkeeper)	Ward No. 39		9414282296
2.	Shikandar	Labour	Ward No. 31		8005638237
3.	Jakir khan	Labour	"		9214920954
4.	Jebida (Female)	Housewife	"		"
5.	Mumtaj (Female)	Housewife	"		9602122877
6.	Neesarkhan	Housewife	"		9799251771
7.	Meeraj bai (Female)	Housewife	"		
8.	Subarti Devi (Female)	Housewife	"		9588899757
9.	Sukhu Devi	Housewife	"		9983631197
10.	Satiksha	Labour	"		9079909510
11.	Jagdish	Labour	"		8949616620
12.	Omprakash	Labour	"		9588899757
13.	Bashati Devi	Housewife	"		8239537438
14.	[illegible]	Housewife	"		9358453661
15.	Kavi devi	(Housewife)	"		9828552860
16.	omprakash	(Shopkeeper)	"		7014486149

Attendance Sheet: Public Consultation of ward no. 39 at Balotra

Photos

PUBLIC CONSULTATION SIGNATURE SHEET

Project name: Rajasthan Secondary Towns Development Sector Project (RSTDSP) - Balotra Water Supply and Sewerage Subproject, District - Barmer, Rajasthan

Date 14.09.2022 **Time:** 5:15 PM

Place: Ward No - 39

S.No.	Name of Par:icipant	Occupation	Address	Signature	Phone Number
1.	Krishan Kumar	Autodriver	Zero Pahink Bhil Basti		9414986769
2.	Mukesh J' Bhil	Fabrics	"	मुकेश	9983966369
3.	Khema Ram Bhil	Labour	"		7597519169
4.	Rama Ram Bhil	"	"		9352962081
5.	Babu ram Bhil	"	"		7378983581
6.	Rama Ram Bhil	"	"		9001561335
7.	Ashoke Bhil	"	"		7849991644
8.	Dhanna Ram Bhil	"	"		7665377316
9.	Jagdish Kumar	-	"		9462161276
10.	Bhola ram Bhil		"		9829682093
11.	Bhanwarlal -	Govt Employee	"		9001114364
12.	Note:- All Person are belong to ~~SC~~ community "Tribes"				
13.					
14.					

Townlevel consultation for Balotra WS &WW subproject

A town level consultation meeting was organised on 3rd May, 2023 in Nagar Parishad Meeting hall which was attended by more then 60 persons including the elected public representatives (Chairman, Municipal Council, Balotra and its Councelors), administrative officers (Additional District Megistrate and Commissioner Municipal Council, Balotra) and safeguard profesionals of CMSC-2 , CAPP experts. Below is the meeting notice and the minutes of the meeting are annexed in this Appendix as Annexure-1.

Meeting Notice

Office of The Superintending Engineer,
Project Implementation Unit (RSTDSP),
RUIDP, PIU BALOTRA

No. RUIDP/SE/PIU/PALI/Pb-IV/2022-23/ 4842 Date: 13/04/23

INVITATION FOR STAKEHOLDER & PUBLIC CONSULTATION

RUIDP-PIU, Balotra ,has scheduled a Stakeholder Meeting to be held in the **Chairmanship of The District Collector, Barmer On** dated **03-05-2023 at Nagar Parishad Meeting Hall, Balotra** for **Balotra** Water Supply and Sewerage Project Under RUIDP–IV(Trench–II) to create awareness about design aspects, benefits of Project, Implementation of environment management plan, environment & social safeguards, and provisions for safety during construction and operation phases.

Organizer: RUIDP – PIU, Balotra

Venue: Nagar Parishad Meeting Hall, Balotra.

Date & Time: 03.05.2023 Time PM 11:00 AM

SANJAY MATHUR
Superintending Engineer,
Date: 12/04/23

No. RUIDP/SE/PIU/PALI/Pb-IV/2022-23/ 4843 - 4858

Copy to following for information and kind request to attend meeting: -

1. The District Collector, Barmer.
2. The Addl. Project Director, RUIDP Jaipur.
3. Add. District Collector Balotra.
4. Sub Divisional officer, Balotra.
5. Chairman, Nagar Parishad Balotra.
6. Vice-Chairman, Nagar Parishad Balotra.
7. Commissioner, Nagar Parishad Balotra. **is requested to inform all councillor and concerned stake holder to participate in program.**
8. Executive Engineer, PWD, Balotra.
9. Executive Engineer, PHED, Balotra.
10. Executive Engineer, JDVVNL, Balotra.
11. Executive Engineer, RUIDP, Barmer/Balotra.
12. Public relation officer, Barmer.
13. District Forest officer, Rajasthan Forest Department, Barmer.
14. Team Leader, CMSC-II, Zone – Jodhpur.
15. Team Leader, CAPP, Jaipur.
16. Team Leader, PMCBC, Jaipur.
17. NGOs.....

SANJAY MATHUR
Superintending Engineer,

Annexure-1. Minutes of the Town Level Consultation Meeting

Rajasthan Secondary Towns Development Sector Project

Minutes of Stakeholder Consultation

Location: Nagar Parishad Meeting Hall, Balotra

Date: 03.05.2023

Title: Public Consultation and Stakeholder Meeting on Proposed Project WS & WW, town Balotra and its Environment and Social Safeguard Compliance.

Location: Nagar Parishad Meeting Hall, Balotra

Data: 03.05.2023

Total Participants: 60

Objectives of Training Workshop:

The primary objective of this consultation was to enhance the knowledge on development induced social and environmental issues related to the implementation of the projects and to introduce the concept of social and environmental safeguards to address those social and environmental issues during the implementing of the projects. The training contains an awareness on social and environmental safeguard policies, best practices and operational guidelines globally practiced.

Participants:

As the module was setting the foundation to understand the concept of social and environmental safeguards, local government bodies (Nagar Parishad, PWD, Irrigation, Forest Department), staff involved in implementation of the project were present in the meeting.

- Superintending Engineer of RUIDP-IV, PIU-Balotra
- Assistant Engineer, RUIDP-Ph IV
- Representatives of CMSC-II, Jodhpur
- Representatives of CAPPC

Activity Schedule of Orientation/Training:

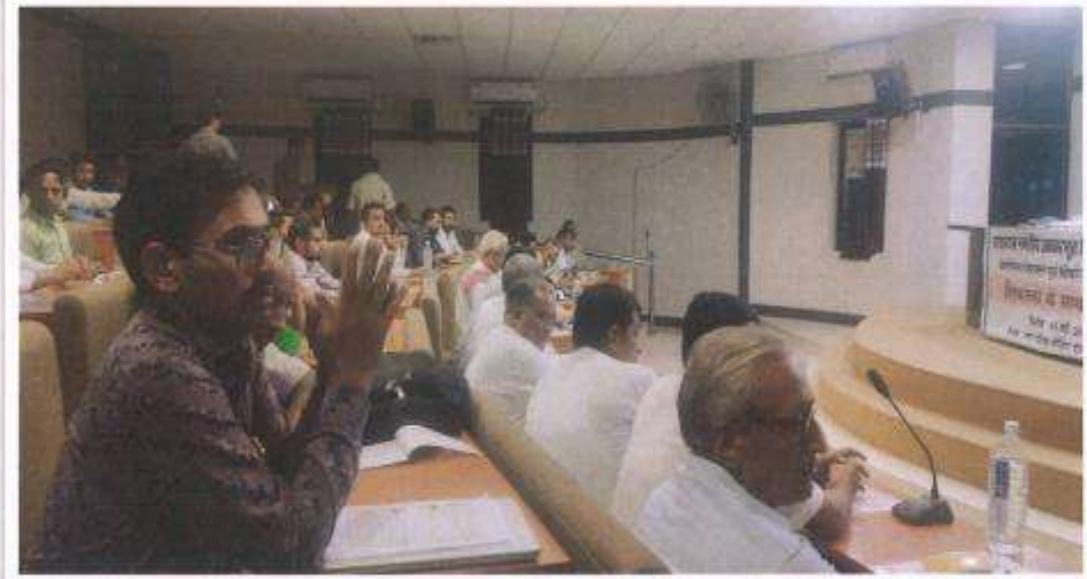
During Public Meeting & Stakeholder Consultation, orientation on proposed subproject components, Safeguard Compliances- both Environment & Social, was delivered through PPT before the respected dias- having Nagar Parishad Chairman (Ms Somitra Jain) / ADM (Mr. Ashwin K Panwar) / SDM (Mr. Vivek Vyas) / Opposition leader of Municipal Council (Mohd Mehboob Khan) / Commissioner- Nagar Parishad (Mr. Shivpal Singh), sitting elected

members of Balotra Nagar Parishad and Govt Dept line agencies officers on 03.05.2023 at Nagar Parishad Meeting Hall, Balotra. The objectives of this consultation were as follows.

- ✓ Briefing of proposed project components- technical aspect
- ✓ Familiarity with the requirement of social and environment international safeguards, policies and operational guidelines that is applicable for the Rajasthan Secondary Towns Development Sector Project
- ✓ Raising awareness on social and environment risks and implications of the subproject.
- ✓ Role of Contractor for ensure safeguard compliances during implementation of the subprojects.
- ✓ Role of local agencies for effective implementation of the subprojects and coordination with others departments for provide no-objection and others approval.
- ✓ Role of Safeguard Agency for ensure safeguard compliances and effective monitoring and reporting.

Mr. Chiranjilal, Gender Expert of CAPPC, RUIDP welcomed the distinguished guests and participants into the workshop. An agenda of workshop was briefed. He explained that the today's program will be focused on the proposed project components and related environmental and social compliances under ADB funded waste water and water supply project of Balotra Town. He also explained the objectives of the workshop.

Mr. Sanjay Mathur, Superintending Engineer, RUIDP-PIU (Balotra) in his introductory speech, briefed about the Project Development Objectives (PDO), He explained the proposed Sewerage and Water Supply scheme of Balotra town & its components Viz. **Under Project Sewerage**: (i) 99.11 km sewer network including 3.61 km trenchless sewer line; (ii) construction of manholes- 7,298 numbers; (iii) sewage house service connections-6,960 numbers; (iv) provision of FSSM to provide low costs sanitation and **under Project Water Supply**: (i) 442.09 Kms of water distribution networks (ii) 8.38 km rising main; (iii) installation of four (04) numbers of pumps at Luni River headwork's (H/W) and four (04) numbers of pumps at Samdai Road headwork; (iv) construction of two (02) consumer relation management centers (CRMC) and one (01) master control center (MCC) and one chlorination room; (v) water supply house service connections-16,222 numbers; and (vi) upgradation of existing supervisory control and data acquisition (SCADA) system. He also told that proposed project is under bidding stage and likely to be awarded soon. The project is based on DBO contract and operation and maintenance of the project assets will also be under the jurisdiction of contractor for 10 years.



Chairman Nagar Parishad discussed about the difficulties in operation of existing sewerage and water supply scheme. Elected Ward Member's suggested that contractor and project implementation unit need to touch with councillors of each wards, prior to commencement of works and suggestion of councillors need to be incorporated during implementation of the project.

A power point presentation was presented by CMSC-II and CAPP Jaipur. Dr. Dinesh Kumar Periwal, ACMS, CMSC-II presented the layout of proposed scheme, locations & capacity of components and technical aspects etc. Consequently, Mr. Rajeev Sharma, Gender & Social Safeguard Professional, CMSC-II Jodhpur briefed them about the main

features of ADB safeguard policy statement (SPS-2005). He also briefed about that works should be undertaken in such a way that impacts should be minimized. If any involuntary impacts are envisaged in future during course of implementation of the project, especially on the loss of livelihood, compensation shall be paid as per ADB agreed Entitlement Matrix. During discussion,he also told that extrapolated data from the sample socio-economic survey of affected persons (APs) had been done. Thus, detailed socio-economic survey of affected persons (APs) will also be conducted during DMS. Grievances Redressal Mechanism (GRM) under RUIDP will be operative throughout the project to ensure timely resolve the grievances.

Dr. Mahaveer Saini, Environmental Safeguard Professional, CMSC-II briefed the august audience about the project activities and requirement of environmental monitoring periodically. He briefed about environmental laws and statutory clearances required for the project, environmental issues and mitigation measures, role and responsibility contractor to ensure environmental compliances. He emphasized that It is the responsibility of contractor to ensure that hard barricading (for sewer line) with retro-reflective arrangements for all the open trenches with GI sheets should be provided so that no person or animal can enter/fall in trench. An information board should also be firmly fixed at every such locations giving information about the duration of closure of works and contractor contact details for grievance, if any.

Mr. Chiranjilal, CAPP briefed that public awareness activities will be carried out throughout the project cycle, to develop the sense of ownership and to sustain project for a long time.

During the meeting ADM City suggested that quality of work should be maintained along with appropriated safety measures during the construction and work should be completed within the time limit. Chairman and some elected Parshads of Nagar Parishad gave suggestion for restoration of roads and barricading around open trenches to avoid any possibility of accidents during construction. Superintending Engineer RUIDP-PIU, Balotra assured for quality of work along with adequate safety measures during construction and timely restoration.

The last session included open discussion on various aspects of proposed project WS & WW works in town Balotra. Participants (municipal councilors) suggested to encourage local resource based approach including hiring of local labour, not to allow any subletting under the contract and RUIDP shall make regular monitoring of civil works to ensure quality, complaint redressal and timely completion etc. SE RUIDP Mr. Sanjay Mathur explained all distinguished participants about provisions/guidelines included in RUIDP contract and assured for execution of work complying all quality aspects.

The workshop was concluded with vote of thanks to all participants and distinguished guests by Mr. Ashwin K Panwar, ADM District Balotra.

RAJEEV SHARMA
Gender & Social
Safeguard Professional
CMSC-II, Jodhpur

Dr. MAHAVEER SAINI
Environment Safeguard
Professional
CMSC-II, Jodhpur

Dr. Dinesh Kumar Periwal
ACMS
CMSC-II, Jodhpur

During the meeting ADM City suggested that quality of work should be maintained along with appropriated safety measures during the construction and work should be completed within the time limit. Chairman and some elected Parshads of Nagar Parishad gave suggestion for restoration of roads and barricading around open trenches to avoid any possibility of accidents during construction. Superintending Engineer RUIDP-PIU, Balotra assured for quality of work along with adequate safety measures during construction and timely restoration.

The last session included open discussion on various aspects of proposed project WS & WW works in town Balotra. Participants (municipal councilors) suggested to encourage local resource based approach including hiring of local labour, not to allow any subletting under the contract and RUIDP shall make regular monitoring of civil works to ensure quality, complaint redressal and timely completion etc. SE RUIDP Mr. Sanjay Mathur explained all distinguished participants about provisions/guidelines included in RUIDP contract and assured for execution of work complying all quality aspects.

The workshop was concluded with vote of thanks to all participants and distinguished guests by Mr. Ashwin K Panwar, ADM District Balotra.

RAJEEV SHARMA
Gender & Social
Safeguard Professional
CMSC-II, Jodhpur

Dr. MAHAVEER SAINI
Environment Safeguard
Professional
CMSC-II, Jodhpur

Dr. Dinesh Kumar Periwal
ACMS
CMSC-II, Jodhpur

Attendance Sheet

राजस्थान नगरीय आधारभूत विकास परियोजना (RUIDP)

चतुर्थ चरण ट्रेंच –II, PIU, Balotra

देनांक 03.05.2023

स्थान– नगर परिषद मिटिंग हॉल, बालोतरा

क्र. सं.	नाम	पद	लिंग (पुरूष/महिला)	मोबाईल नम्बर	हस्ताक्षर
1	सुमित्रा जैन	सभापति	महिला	[illegible]	[signature]
2	Ashwin K. Panwar	ADM Balotra	Male	9461441410	[signature]
3	Shrawan pal Singh	Com. M.C. B/t	Male	8504915915	[signature]
4	Sanjay Mathur	S.E. RUIDP	Male	[illegible]	[signature]
5	Dr. Dinesh K. Panwar	[illegible]	M	[illegible]	[signature]
6	[illegible]	[illegible]	पुरुष	9314038886	[signature]
7	[illegible]	[illegible]	पुरुष	[illegible]	[signature]
8	[illegible]	पार्षद	पुरुष	[illegible]	[signature]
9	[illegible]	पार्षद	महिला	94143 30723	[signature]
10	[illegible]	पार्षद	पुरुष	[illegible]	[signature]
11	[illegible]	पार्षद	पुरुष	[illegible]	[signature]

5.16

RUIDP राजस्थान नगरीय आधारभूत विकास परियोजना (RUIDP)

चतुर्थ चरण ट्रेंच –II, PIU, Balotra

दिनांक 03.06.2023

स्थान– नगर परिषद मिटिंग हॉल, बालोतरा

क्र. सं.	नाम	पद	लिंग (पुरुष/महिला)	मोबाईल नम्बर	हस्ताक्षर
12	अंकुर शर्मा	सहायक अभियन्ता (PHED)	पुरुष	9057340737	Ankur
13	Tara	Board ward (35)	female	9950433400	Tara
14	हनुमान पालीवाल	पार्षद	M	9414755120	[illegible]
15	[illegible]	[illegible] PHED		[illegible]	[illegible]
16	[illegible]	कनिष्ठ अभियन्ता	M	[illegible]	[illegible]
17	हनुमानराम [illegible]	पार्षद	M	9571956656	[illegible]
18	नरेश कुमार मीणा	AE PHED [illegible]	M	[illegible]	[illegible]
19	मोहनलाल [illegible]	नेता प्रतिपक्ष	M	9460288675	[illegible]
20	[illegible]	पार्षद	M	9414326977	[illegible]
21	[illegible]	[illegible]	M	[illegible]	[illegible]
22	कान्तीलाल [illegible]	पार्षद	पु.	9414350750	[illegible]

राजस्थान नगरीय आधारभूत विकास परियोजना (RUIDP)

चतुर्थ चरण ट्रैंच –II, PIU, Balotra

दिनांक 03.05.2023 स्थान– नगर परिषद मिटिंग हॉल, बालोतरा

क्र. सं.	नाम	पद	लिंग (पुरुष / महिला)	मोबाईल नम्बर	हस्ताक्षर
23	रमेशपुरी गोस्वामी	पार्षद	पु.	7931002221	
24	[illegible]	[illegible]	पु	[illegible]	
25	प्रमोद कुमार	J.E.N [illegible]	पु	800398[illegible]	
26	[illegible]	[illegible]	[illegible]	[illegible]	
27	Babulal	पार्षद वार्ड 22	[illegible]	9462715298	
28	[illegible]	[illegible]	[illegible]	[illegible]	
29	[illegible]	[illegible]	[illegible]	7014173820	
30	[illegible]	[illegible]	[illegible]	9413306609	
31	[illegible] P.A. [illegible]		पु.	[illegible]	
32	[illegible]	[illegible]	[illegible]	[illegible]	
33	[illegible]	पार्षद		9694595155	

5.16

राजस्थान नगरीय आधारभूत विकास परियोजना (RUIDP)

चतुर्थ चरण ट्रेंच –II, PIU, Balotra

दिनांक 03.05.2023

स्थान– नगर परिषद मिटिंग हॉल, बालोतरा

क्र. सं.	नाम	पद	लिंग (पुरूष/महिला)	मोबाईल नम्बर	हस्ताक्षर
34	Sarila Sandila	man. Municipal	F	9460081890	Sarila
35	[illegible]	पार्षद	महिला	9982449288	[illegible]
36	Pucharaj Rajpurohit	पूर्व पार्षद	पु.	9214412029	[illegible]
37	Akharam Panwar	AEn. MC Bt	M	9828503268	[illegible]
38	[illegible]	Parshad	[illegible]	9460887100	[illegible]
39	[illegible]	पार्षद	पु.	9829154426	Sampat
40	[illegible]	[illegible]	पु	9414002901	[illegible]
41	[illegible]	UDC	पुरुष	8005384859	[illegible]
42	[illegible]	पार्षद	पु	9413524017	[illegible]
43	[illegible]	पार्षद	पु	9414755482	[illegible]
44	[illegible]	पार्षद	पु	9649009820	[illegible]

5.16

राजस्थान नगरीय आधरभूत विकास परियोजना (RUIDP)

चतुर्थ चरण ट्रेंच –II, PIU, Balotra

दिनांक 03.05.2023 स्थान– नगर परिषद मिटिंग हॉल, बालोतरा

क्र. सं.	नाम	पद	लिंग (पुरुष / महिला)	मोबाईल नम्बर	हस्ताक्षर
45	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
46	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
47	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
48	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
49	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
50	Shiv Kumar Patel	[illegible]	M	9413375411	[illegible]
51	[illegible]	[illegible]	M	[illegible]	[illegible]
52	[illegible]	[illegible]	M	[illegible]	[illegible]
53	Khemaram Choudhary	[illegible]	M	[illegible]	[illegible]
54	SANTILAL JARAN	[illegible]	M	[illegible]	[illegible]
55	Kunda Singh	[illegible]	M	[illegible]	[illegible]

5.14

राजस्थान नगरीय आधारभूत विकास परियोजना (RUIDP)

चतुर्थ चरण ट्रैंच –II, PIU, Balotra

दिनांक 03.05.2023

स्थान– नगर परिषद मिटिंग हॉल, बालोतरा

क्र. सं.	नाम	पद	लिंग (पुरुष/महिला)	मोबाईल नम्बर	हस्ताक्षर
56	Dr. Mahaveer P. Saini	Env. Safeguard Professional (MSC)	Male	9509157249	[illegible]
57	Rajeev Sharma	Contract Social Safeguard Rule and Child [illegible]	M	9310010210	[illegible]
58	Bhikam Ram	AEn. RUIDP	M	8619022942	[illegible]
59	Vivek Vayes	SDM, Balotra	M		
60	Chiranjee Lal Chandel	Gender Specialist CAPC RUIDP [illegible]	M	6958539025	[illegible]
61					
62					
63					
64					
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66					

[illegible]

News Paper Cutting

News Paper: Dainik Bhaskar **Date: 03.05.2023**

बालोतरी: घरों में जलापूर्ति और सीवरेज कनेक्शन के लिए 182 करोड़ की परियोजना

बालोतरा(निसं)। राजस्थान नगरीय आधारभूत विकास परियोजना के तहत आयोजित हितधारकों के साथ परिचर्चा कार्यक्रम का आयोजन नगर परिषद सभागार में किया गया जिसमें अतिरिक्त जिला कलक्टर अश्वनी के. पंवार, उपखण्ड अधिकारी विवेक व्यास, सभापति नगर परिषद् सुमित्रा जैन बालोतरा शहर के वार्ड पार्षद, सहयोगी विभाग के अधिकारी एवं स्वयं सेवी संस्था के प्रतिनिधि सहित लगभग 60 से अधिक व्यक्तियों ने सहभागिता निभाई।

परिचर्चा कार्यक्रम में आरयूआईडीपी के अधीक्षण अभियन्ता संजय माथुर ने आये हुए अतिथियों का स्वागत कर परियोजना स्वरूप की विस्तृत जानकारी देते हुए बताया कि परियोजना के तहत 182.03 करोड़ रूपये की लागत से जलापूर्ति योजना के तहत लगभग 443 किलोमीटर लाईन बिछाकर 18269 घरों के पेयजल कनेक्शन से जोड़ने तथा सीवरेज योजना में लगभग 126 किलोमीटर सीवर लाइन बिछाने के साथ लगभग 5500 घरों को सीवरेज कनेक्शन से जोड़ने का कार्य प्रस्तावित है। उक्त कार्य के बाद 10 वर्ष तक परियोजना कार्य का रखरखाव संवेदक फर्म द्वारा ही किया जायेगा। परिचर्चा कार्यक्रम में अतिक्ति जिला कलक्टर अश्वनी के. पंवार ने आरयूआईडीपी द्वारा दी गई जानकारी पर विशेष टिप्पणी करते हुए निर्देशित किया कि कार्य आचार संहिता लगने से पूर्व चालू कर निश्चित अवधि में पूर्ण करते हुए गुणवत्ता का विशेष ध्यान रखे साथ ही सभी वार्ड पार्षदों से अपील की कि आरयूआईडीपी के तहत किये जाने वाले कार्यों के क्रियान्वयन में सहयोग करें जिससे कि बालोतरा की जनता को योजना का लाभ मिल सके। परिचर्चा कार्यक्रम में सभापति नगर परिषद सुमित्रा जैन ने सुझाव दिये कि रोड़ की खुदाई करने के बाद उसका निश्चित अवधि में रोडरेस्टोरेशन का कार्य करे सरकारी विद्यालयों, चिकित्सालयों एवं सामुदायिक भवनों को भी सीवरेज लाईन से जोड़ने का कार्य किया जाये इसके साथ ही सभापति ने सभी आये हुए जनप्रतिनिधियों विभाग के अधिकारियों का धन्यवाद ज्ञापित किया।

परिचर्चा कार्यक्रम में उपखण्ड अधिकारी विवेक व्यास ने जानकारी दी कि मुख्य सड़क पर सीवर लाइन बिछाने का कार्य छोटे-छोटे टुकड़ों में करते हुए रोड डायवर्जन का विशेष ध्यान रखकर कार्य किया जाये जिससे आवागमन में अव्यवस्था न हो साथ ही सभी वार्ड पार्षदों से अपील की कि कार्य के दौरान अपने वार्ड में खड़े रहकर कार्य करवायें ताकि कोई भी गली योजना से वंचित न रहें। परिचर्चा कार्यक्रम में परियोजना के तकनीकी स्वरूप सामूदायिक जागरूकता, सोशियल सेफगार्ड एवं पर्यावरण संरक्षण पर जयपुर से आये जेण्डर विशेषज्ञ घिरंजी लाल चन्देल तथा जोधपुर से आये सीएमएससी के डिप्टी टीम लीडर दिनेश पेंडीवाल, राजीव शर्मा एवं महावीर सैनी ने पावर पोईन्ट प्रजन्टेशन के माध्यम से जानकारी दी।

दैनिक प्रतिनिधि

Appendix 5: Integrated Biodiversity Assessment Tool World Bank Group Biodiversity Risk Screen BALOTRA Sewerage and Water Supply Networks

IBAT

Integrated Biodiversity Assessment Tool

PROXIMITY REPORT
BALOTRA WW WS

Country: India

Location: [25.8, 72.2]

Date of analysis: 31 October 2022 (GMT)

Buffers applied: 10 km | 50 km

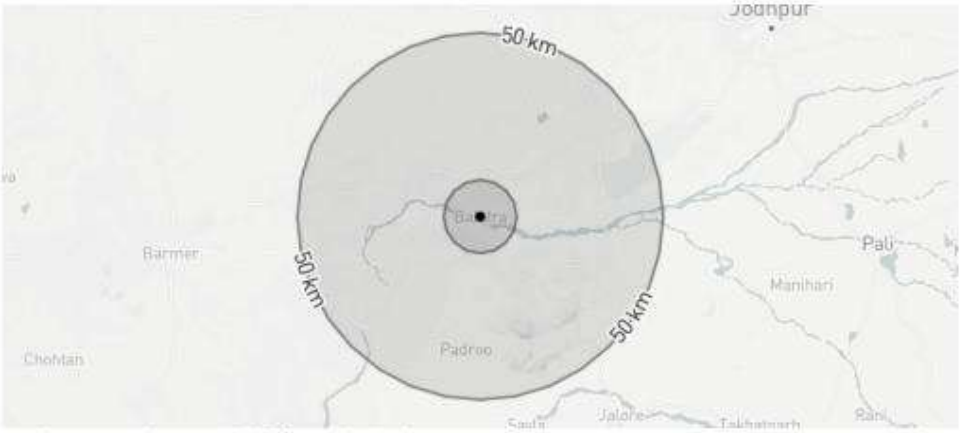
IUCN Red List Biomes: Freshwater, Terrestrial

Generated by: Govind Rathore

Organisation: ADB

Overlaps with:

Protected Areas	0
Key Biodiversity Areas	0
IUCN Red List	37



Displaying project location and buffers: 10 km, 50 km

IBAT

About this report

This report presents the results of [30102-35673] proximity analysis to identify the biodiversity features and species which are located within the following buffers: 10 km, 50 km.

This report is one part of a package generated by IBAT on 31 October 2022 (GMT) that includes full list of all species, protected areas, Key Biodiversity Areas in CSV format, maps showing the area of interest in relation to these features, and a 'How to read IBAT reports' document.

WARNING: IBAT aims to provide the most up-to-date and accurate information available at the time of analysis. There is however a possibility of incomplete, incorrect or out-of-date information. All findings in this report must be supported by further desktop review, consultation with experts and/or on-the-ground field assessment. Please consult IBAT for any additional disclaimers or recommendations applicable to the information used to generate this report.

Please note, sensitive species data are currently not included in IBAT reports in line with the Sensitive Data Access Restrictions Policy for the IUCN Red List. This relates to sensitive Threatened species and KBAs triggered by sensitive species.

Data used to generate this report

- UNEP-WCMC and IUCN, 2022. Protected Planet: The World Database on Protected Areas (WDPA)[On-line], Cambridge, UK: UNEP-WCMC and IUCN. Available at: www.protectedplanet.net - October 2022.
- BirdLife International (on behalf of the KBA Partnership), 2022. Key Biodiversity Areas - April 2022.
- IUCN, 2022. IUCN Red List of Threatened Species - August 2022.
- IUCN. The IUCN Red List of Threatened Species. Version 2019-3. (2019). https://www.iucnredlist.org
- IUCN. Threats Classification Scheme (Version 3.2). (2019)
- Strassburg, B.B.N., Iribarrem, A., Beyer, H.L. et al. Global priority areas for ecosystem restoration. Nature 586, 724–729 (2020). https://doi.org/10.1038/s41586-020-2784-9

IBAT

Protected Areas

The following protected areas are found within 10 km, 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

No protected areas within buffer distance

Key Biodiversity Areas

The following key biodiversity areas are found within 10 km, 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

No KBAs within buffer distance

IUCN Red List of Threatened Species

The following threatened species are potentially found within 50km of the area of interest.

For the full IUCN Red List please refer to the associated csv in the report folder.

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Ardeotis nigriceps	Great Indian Bustard	AVES	CR	Decreasing	Terrestrial
Sypheotides indicus	Lesser Florican	AVES	CR	Decreasing	Terrestrial
Vanellus gregarius	Sociable Lapwing	AVES	CR	Decreasing	Terrestrial
Gyps bengalensis	White-rumped Vulture	AVES	CR	Decreasing	Terrestrial
Sarcogyps calvus	Red-headed Vulture	AVES	CR	Decreasing	Terrestrial
Gyps indicus	Indian Vulture	AVES	CR	Decreasing	Terrestrial
Geoclemys hamiltonii	Spotted Pond Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater

IBAT

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Nilssonia gangetica	Indian Softshell Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
Oxyura leucocephala	White-headed Duck	AVES	EN	Decreasing	Terrestrial, Freshwater
Neophron percnopterus	Egyptian Vulture	AVES	EN	Decreasing	Terrestrial, Freshwater
Falco cherrug	Saker Falcon	AVES	EN	Decreasing	Terrestrial, Marine, Freshwater
Leptoptilos dubius	Greater Adjutant	AVES	EN	Decreasing	Terrestrial, Freshwater
Manis crassicaudata	Indian Pangolin	MAMMALIA	EN	Decreasing	Terrestrial
Panthera tigris	Tiger	MAMMALIA	EN	Decreasing	Terrestrial
Varanus flavescens	Yellow Monitor	REPTILIA	EN	Decreasing	Terrestrial
Aquila nipalensis	Steppe Eagle	AVES	EN	Decreasing	Terrestrial
Crocodylus palustris	Mugger	REPTILIA	VU	Stable	Terrestrial, Freshwater
Wallago attu		ACTINOPTERYGII	VU	Decreasing	Freshwater
Marmaronetta angustirostris	Marbled Teal	AVES	VU	Decreasing	Terrestrial, Marine, Freshwater
Aythya ferina	Common Pochard	AVES	VU	Decreasing	Terrestrial, Marine, Freshwater

IBAT

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Columba eversmanni	Yellow-eyed Pigeon	AVES	VU	Decreasing	Terrestrial, Freshwater
Grus antigone	Sarus Crane	AVES	VU	Decreasing	Terrestrial, Freshwater
Sterna aurantia	River Tern	AVES	VU	Decreasing	Terrestrial, Marine, Freshwater
Clanga clanga	Greater Spotted Eagle	AVES	VU	Decreasing	Terrestrial, Freshwater
Aquila rapax	Tawny Eagle	AVES	VU	Decreasing	Terrestrial, Freshwater
Aquila heliaca	Eastern Imperial Eagle	AVES	VU	Decreasing	Terrestrial, Freshwater
Lissemys punctata	Indian Flapshell Turtle	REPTILIA	VU	Decreasing	Terrestrial, Freshwater
Xenochrophis cerasogaster	Painted Keelback	REPTILIA	VU	Decreasing	Freshwater
Schizothorax plagiostomus	Snow Trout	ACTINOPTERYGII	VU	Decreasing	Freshwater
Bagarius bagarius		ACTINOPTERYGII	VU	Decreasing	Freshwater
Acinonyx jubatus	Cheetah	MAMMALIA	VU	Decreasing	Terrestrial
Panthera pardus	Leopard	MAMMALIA	VU	Decreasing	Terrestrial
Geochelone elegans	Indian Star Tortoise	REPTILIA	VU	Decreasing	Terrestrial
Saara hardwickii	Indian Spiny-tailed Lizard	REPTILIA	VU	Decreasing	Terrestrial

IBAT

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Saxicola macrorhynchus	White-browed Bushchat	AVES	VU	Decreasing	Terrestrial
Chlamydotis macqueenii	Asian Houbara	AVES	VU	Decreasing	Terrestrial
Oryza malampuzhaensis		LILIOPSIDA	VU	Decreasing	Terrestrial

IBAT

Recommended citation

IBAT Proximity Report. Generated under licence 30102-35673 from the Integrated Biodiversity Assessment Tool on 31 October 2022 (GMT). www.ibat-alliance.org

How to use this report

This report provides an indication of the potential biodiversity-related features - protected areas, key biodiversity areas and species - close to the specified location. It provides an early indication of potential biodiversity concerns, and can provide valuable guidance in making decisions. For example, this information can be helpful when assessing the potential environmental risk and impact of a site, categorising investments/projects, preparing the terms of reference for an impact assessment, focusing attention on key species of conservation concern and sites of known conservation value, and reviewing the results of an impact assessment.

The report does not provide details of potential indirect, downstream or cumulative impacts. Furthermore, the report should be regarded as a "first-step", providing a set of conservation values sourced from global data sets, and is not a substitute for further investigation and due diligence, especially concerning national and/or local conservation priorities.

IBAT

Integrated Biodiversity Assessment Tool

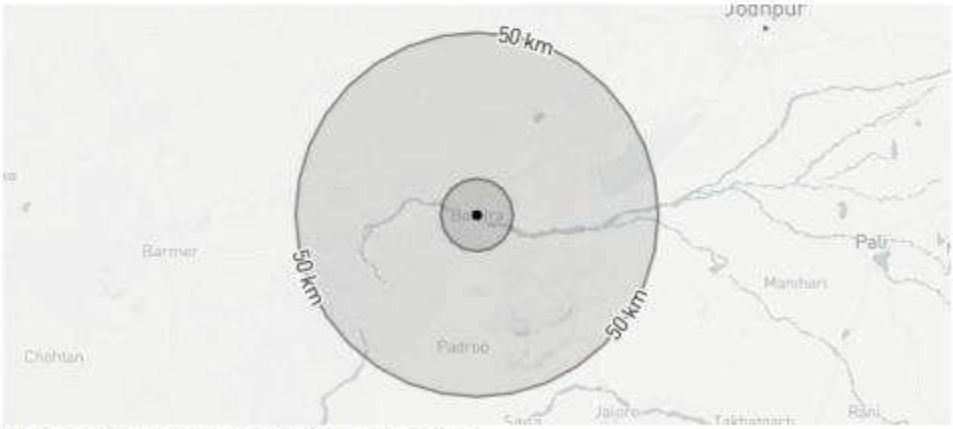
World Bank Group Biodiversity Risk Screen

BALOTRA WW WS

- **Country:** India
- **Location:** [25.8, 72.2]
- **IUCN Red List Biomes:** Freshwater, Terrestrial
- **Created by:** Govind Rathore

Overlaps with:

Protected Areas	1 km: 0	10 km: 0	50 km: 0	0
World Heritage (WH)	1 km: 0	10 km: 0	50 km: 0	0
Key Biodiversity Areas	1 km: 0	10 km: 0	50 km: 0	0
Alliance for Zero Extinction (AZE)	1 km: 0	10 km: 0	50 km: 0	0
IUCN Red List				16
Critical Habitat				Unclassified



Displaying project location and buffers: 1 km, 10 km, 50 km

WORLD BANK GROUP

This report is based on IFC Performance Standard 6 (PS6) but applies to World Bank Environmental and Social Standard 6 (ESS6)

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About this report

The recommendations stated alongside any Protected Areas and Key Biodiversity Areas identified in this report are determined by the following:

Protected Areas:

- 'Highest risk. Seek expert help' is stated if the report identifies a designation that includes either 'natural' or 'mixed world heritage site'.
- 'Assess for Critical Habitat' is stated if the report identifies a Strict Nature Reserve, Wilderness Area or National Park as coded by IUCN protected area categories Ia, Ib and II.
- 'Assess for biodiversity risk' is stated if the report identifies any other type of protected area.

Key Biodiversity Areas:

- 'Highest risk. Seek expert help' is stated if the report identifies an Alliance for Zero Extinction site.
- 'Assess for Critical Habitat' is stated if the report identifies Critically Endangered or Endangered species OR species with restricted ranges OR congregatory species as coded in the IUCN Red List of Threatened Species.
- 'Assess for biodiversity risk' is stated if the report identifies any other type of Key Biodiversity Area.

IBAT provides initial screening for Critical Habitat values. Performance Standard 6 (PS6) defines these values for Critical Habitat (PS6: para. 16) and legally protected and internationally recognized areas (PS6: para. 20). PS6 will be triggered when IFC client activities are located in modified habitats containing "significant biodiversity value," natural habitats, Critical Habitats, legally protected areas, or areas that are internationally recognized for biodiversity. References to PS6 and Guidance Note 6 (GN6) are provided to guide further assessment and detailed definitions where necessary. Please see https://www.ifc.org/ps6 for full details on PS6 and GN6.

This report identifies restricted range species according to the KBA Standard definition (hyperlink KBA Standard https://portals.iucn.org/library/sites/library/files/documents/2016-048.pdf):

Species having a global range size less than or equal to the 25th percentile of range-size distribution in a taxonomic group within which all species have been mapped globally, up to a maximum of 50,000 km2. If all species in a taxonomic group have not been mapped globally, or if the 25th percentile of range-size distribution for a taxonomic group falls below 10,000 km2, restricted range should be defined as having a global range size less than or equal to 10,000 km2. For coastal, riverine and other species with linear distributions that do not exceed 200 km width at any point, restricted range is defined as having a global range less than or 15 equal to 500 km linear geographic span (i.e. the distance between occupied locations furthest apart).

Note, sites supporting restricted range species can qualify as KBAs under criterion B2. These are sites that hold a significant proportion of the global population size of multiple restricted-range species, and so contribute significantly to the global persistence of biodiversity at the genetic and species level.

The report screens for known risks within a standard 50km buffer of the coordinates used for analysis. This buffer is not intended to indicate the area of impact. The report can be used to:

- Scope risks to include within an assessment of risks and impacts

- Identify gaps within an existing assessment of risks and impacts
- Prioritize between sites in a portfolio for further assessment of risks and impacts
- Inform a preliminary determination of Critical Habitat
- Assess the need for engaging a biodiversity specialist
- Identify additional conservation experts or organizations to inform further assessment or planning

WARNING: IBAT aims to provide the most up-to-date and accurate information available at the time of analysis. There is however a possibility of incomplete, incorrect or out-of-date information. All findings in this report must be supported by further desktop review, consultation with experts and/or on-the-ground field assessment as described in PS6 and GN6. Please consult IBAT for any additional disclaimers or recommendations applicable to the information used to generate this report.

Please note, sensitive species data are currently not included in IBAT reports in line with the Sensitive Data Access Restrictions Policy for the IUCN Red List. This relates to sensitive Threatened species and KBAs triggered by sensitive species.

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Priority Species

Habitat of significant importance to priority species will trigger Critical Habitat status (See PS6: para 16). IBAT provides a preliminary list of priority species that could occur within the 50km buffer. This list is drawn from the IUCN Red List of Threatened Species (IUCN RL). This list should be used to guide any further assessment, with the aim of confirming knownor likely occurrence of these species within the project area. It is also possible that further assessment may confirm occurrence of additional priority species not listed here. It is strongly encouraged that any new species information collected by the project be shared with species experts and/or IUCN wherever possible in order to improve IUCN datasets.

IUCN Red List of Threatened Species - CR & EN

The following species are potentially found within 50km of the area of interest.
For the full IUCN Red List please refer to the associated csv in the report folder.

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Geoclemys hamiltonii	Spotted Pond Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
Nilssonia gangetica	Indian Softshell Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
Oxyura leucocephala	White-headed Duck	AVES	EN	Decreasing	Terrestrial, Freshwater
Neophron percnopterus	Egyptian Vulture	AVES	EN	Decreasing	Terrestrial, Freshwater
Falco cherrug	Saker Falcon	AVES	EN	Decreasing	Terrestrial, Marine, Freshwater
Leptoptilos dubius	Greater Adjutant	AVES	EN	Decreasing	Terrestrial, Freshwater
Ardeotis nigriceps	Great Indian Bustard	AVES	CR	Decreasing	Terrestrial
Sypheotides indicus	Lesser Florican	AVES	CR	Decreasing	Terrestrial

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Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Vanellus gregarius	Sociable Lapwing	AVES	CR	Decreasing	Terrestrial
Gyps bengalensis	White-rumped Vulture	AVES	CR	Decreasing	Terrestrial
Sarcogyps calvus	Red-headed Vulture	AVES	CR	Decreasing	Terrestrial
Gyps indicus	Indian Vulture	AVES	CR	Decreasing	Terrestrial
Manis crassicaudata	Indian Pangolin	MAMMALIA	EN	Decreasing	Terrestrial
Panthera tigris	Tiger	MAMMALIA	EN	Decreasing	Terrestrial
Varanus flavescens	Yellow Monitor	REPTILIA	EN	Decreasing	Terrestrial
Aquila nipalensis	Steppe Eagle	AVES	EN	Decreasing	Terrestrial

Restricted Range Species

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Macrobrachium rosenbergii	Giant River Prawn	MALACOSTRACA	LC OR LR/LC	Unknown	Freshwater

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Biodiversity features which are likely to trigger Critical Habitat

Protected Areas

There are no protected areas to show for this report.

Key Biodiversity Areas

There are no key biodiversity areas to show for this report.

Species with potential to occur

Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
REPTILIA	49	8	0	3	5	2	38	1
AVES	249	21	6	5	10	13	215	0
ACTINOPTERYGII	33	3	0	0	3	2	28	0
AMPHIBIA	7	0	0	0	0	0	7	0
INSECTA	34	0	0	0	0	0	33	1
GASTROPODA	17	0	0	0	0	0	17	0
POLYPODIOPSIDA	2	0	0	0	0	0	2	0
MAGNOLIOPSIDA	32	0	0	0	0	0	31	1
LILIOPSIDA	46	1	0	0	1	0	43	2
BIVALVIA	6	0	0	0	0	0	6	0
MALACOSTRACA	2	0	0	0	0	0	2	0
MAMMALIA	56	4	0	2	2	2	50	0

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Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
AGARICOMYCETES	2	0	0	0	0	1	1	0

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Recommended citation

IBAT PS6 & ESS6 Report. Generated under licence 30102-35672 from the Integrated Biodiversity Assessment Tool on 31 October 2022 (GMT). www.ibat-alliance.org

Recommended Experts and Organizations

For projects located in Critical Habitat, clients must ensure that external experts with regional expertise are involved in further assessment (GN6: GN22). Clients are encouraged to develop partnerships with recognized and credible conservation organizations and/or academic institutes, especially with respect to potential developments in natural or Critical Habitat (GN6: GN23). Where Critical Habitats are triggered by priority species, species specialists must be involved. IBAT provides data originally collected by a large network of national partners, while species information is sourced via the IUCN Red List and affiliated Species Specialist Groups. These experts and organizations are listed below. **Please note that this is not intended as a comprehensive list of organizations and experts. These organizations and experts are under no obligation to support any further assessment and do so entirely at their discretion and under their terms. Any views expressed or recommendations made by these stakeholders should not be attributed to the IFC or IBAT for IFC partners.**

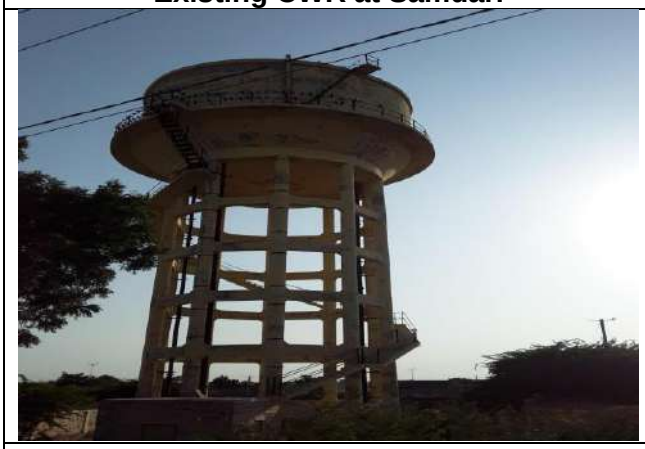
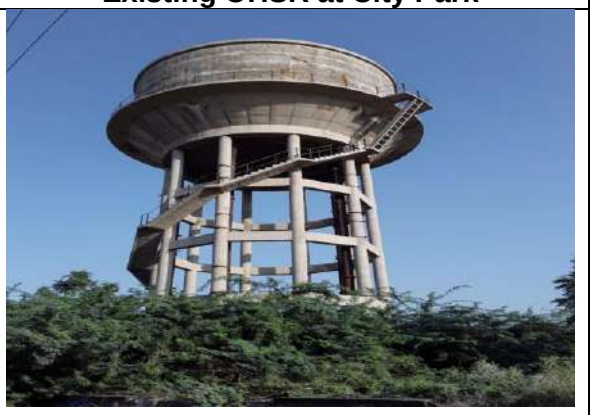
Birdlife Partners

URL: https://www.birdlife.org/worldwide/partnership/birdlife-partners

Directory for Species Survival Commission (SSC) Specialist Groups and Red List Authorities

URL: https://www.iucn.org/commissions/ssc-groups

Appendix 6: Photographs of Proposed Component Locations and Existing components

	
Existing CWR at Luni HWs	**Existing CWR at Luni River**
	
Existing CWR at Samdari	**Existing OHSR at City Park**
	
Existing OHSR at Gandhipura	**Existing OHSR at Krishimandi**

Existing OHSR at Ranuja

Existing OHSR at Luni Pump House

Exiting WTP 119 MLD at Biliya, Pokran

Appendix 7: NOCs for proposed works
Land NOC for construction of CWR/RWR and Pump House

OFFICE OF SUPERITENDING ENGINEER PHED CIRCLE BARMER

No - SE/TA/22-23/ 6844 Date 20/09/2022

Chief Engineer
RUIDP/RUDSICO
Jaipur

Sub:- Regarding NOC for works at PHED campuses at Balotra under Balotra Water Supply and Waste Water works- RUIDP Phase-IV.
Ref:- Your Office Letter No-8107 Dated 19-09-2022.

With due respect, In the above reference & subject matter, NOC is issuance with following terms and condition.

At Luni River HW & Samdari HW.

1. Existing water supply arrangement may not be disturbed.
2. Any damage caused by your agency will be fully responsible for its repairing.
3. If Departmental water is taken for construction purpose will be chargeable as per departmental prevalent charges.
4. Taking over and handing over the scheme after completion of Phase-IV is wholly depended on satisfaction of the completed work and successfully trial of the scheme with present of departmental officer.

In compliance of the above Terms & Condition, NOC is issued for use of PHED premises at balotra under the said Project & further necessary action.

(Bharat Singh)
Superintending Engineer
PHED Circle Barmer

No – SE/TA/22-23/ 6845 Date 20/09/2022

Copy to following for information and necessary action –

1. Executive Engineer PHED Division Balotra.

Superintending Engineer

Appendix 8: Letter for Allotment of Water for Balotra Town Water Supply Project of Balotra

कार्यालय अधीक्षण अभियंता
जन स्वास्थ्य अभियांत्रिकी विभाग
परियोजना वृत पोकरण
Email : pfhsphed@gmail.com

क्रम संख्या- 547 दिनांक - 1 2 22

नगर आयुक्त
नगर परिषद
बालोतरा

विषय: बालोतरा शहर में जल उपलब्धता एवं आपूर्ति स्थल अवगत करवाने के संबंध मे।

संदर्भ: आपके कार्यालय पत्रांक न0प0बा0/विकास/2022/12530 दिनांक 01.02.2022

उपरोक्त विषयान्तर्गत एवं सदर्भित पत्र के क्रम में लेख है कि पोकरण फलसूण्ड बालोतरा सिवाना पेयजल परियोजना के अंतर्गत डिजायन वर्ष 2038 की बालोतरा नगर की जलमांग 24.45 एमएलडी आंकी गयी है, जिसकी 80 प्रतिशत मांग अर्थात 19.56 एमएलडी जलमांग का जसोल फांटा आफटेक पर प्रावधान लिया गया है।

यास्ते आवश्यक कार्यवाही हेतु प्रेषित है।

अधीक्षण अभियंता
जन स्वा0 अभि0 विभाग
परियोजना वृत पोकरण

क्रम संख्या- 548 - 549 दिनांक 1-2-22

प्रतिलिपि- निम्नांकित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित है-

1. अतिरिक्त मुख्य अभियंता जन स्वा0 अभि0 विभाग परियोजना बाड़मेर।
2. अधीक्षण अभियता जन स्वा0 अभि0 विभाग वृत बाड़मेर।

अधीक्षण अभियंता
जन स्वा0 अभि0 विभाग
परियोजना वृत पोकरण

Initial Environmental Examination

Document Stage: Draft for consultation
Project Number: 42267-034
May 2023

India: Rajasthan Secondary Towns Development Sector Project – Additional Financing (PART B)

Common Appendices to IEE

Prepared by Rajasthan Urban Drinking Water Sewerage and Infrastructure Corporation Limited-External Aided Project (RUDSICO-EAP) for the Asian Development Bank.

APPENDICES:

Appendix C-1: Drinking Water Standards

Group	National Standards for Drinking Water[a]			WHO Guidelines for Drinking-Water Quality, 4th Edition, 2011[b]	Applicable Per ADB SPS [c, d]
	Parameter	Unit	Max. Concentration Limits[d]		
Physical	Turbidity	NTU	1 (5)	-	1 (5)
	pH		6.5 – 8.5	none	6.5 – 8.5
	Color	Hazen units	5 (15)	none	5 (15)
	Taste and Odor		Agreeable	-	Agreeable
	TDS	mg/l	500 (2,000)	-	500 (2,000)
	Iron	mg/l	0.3	-	0.3
	Manganese	mg/l	0.1 (0.3)	-	0.1 (0.3)
	Arsenic	mg/l	0.01 (0.05)	0.01	0.01
	Cadmium	mg/l	0.003	0.003	0.003
	Chromium	mg/l	0.05	0.05	0.05
	Cyanide	mg/l	0.05	none	0.05
	Fluoride	mg/l	1 (1.5)	1.5	1 (1.5)
	Lead	mg/l	0.01	0.01	0.01
	Ammonia	mg/l	0.5	none established	0.5
Chemical	Chloride	mg/l	250 (1,000)	none established	250 (1,000)
	Sulphate	mg/l	200 (400)	none	200 (400)
	Nitrate	mg/l	45	50	45
	Copper	mg/l	0.05 (1.5)	2	0.05 (1.5)
	Total Hardness	mg/l	200 (600)	-	200 (600)
	Calcium	mg/l	75 (200)	-	75 (200)
	Zinc	mg/l	5 (15)	none established	5 (15)
	Mercury	mg/l	0.001	0.006	0.001
	Aluminum	mg/l	0.1 (0.3)	none established	0.1 (0.3)
	Residual Chlorine	mg/l	0.2	5	0.2
Micro Germs	E-coli	MPN/100ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample
	Total Coliform	MPN/100ml			

Note-

[a] Bureau of India Standard 10500: 2012.

[b] Health-based guideline values.

[c] Per ADB SPS, the government shall achieve whichever of the standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

[d] Figures in parenthesis are maximum limits allowed in the absence of alternate source.

Appendix C-2: Ambient Air Quality Standards

Parameter	Location [a]	India Ambient Air Quality Standard [b] ($\mu g/m^3$)	WHO Air Quality Guidelines ($\mu g/m^3$)		Applicable Per ADB SPS[e] ($\mu g/m^3$)
			Global Update [c] 2005	Second Edition 2000	
PM_{10}	Industrial Residential, Rural and Other Areas	60 (Annual) 100 (24-hr)	20 (Annual) 50 (24-hr)	-	20 (Annual) 50 (24-hr)
	Sensitive Area	60 (Annual) 100 (24-hr)	20 (Annual) 50 (24-hr)	-	20 (Annual) 50 (24-hr)
PM_{25}	Industrial Residential, Rural and Other Areas	40 (Annual) 60 (24-hr)	10 (Annual) 25 (24-hr)	-	10 (Annual) 25 (24-hr)
	Sensitive Area	40 (Annual) 60 (24-hr)	10 (Annual) 25 (24-hr)		10 (Annual) 25 (24-hr)
SO_2	Industrial Residential, Rural and Other Areas	50 (Annual) 80 (24-hr)	20 (24-hr) 500 (10-min)	-	50 (Annual) 20 (24-hr) 500 (10-min)
	Sensitive Area	20 (Annual) 80 (24-hr)	20 (24-hr) 500 (10-min)	-	20 (Annual) 20 (24-hr) 500 (10-min)
NO_2	Industrial Residential, Rural and Other Areas	40 (Annual) 80 (24-hr)	40 (Annual) 200 (1-hr)	-	40 (Annual) 80 (24-hr) 200 (1-hr)
	Sensitive Area	30 (Annual) 80 (24-hr)	40 (Annual) 200 (1-hr)	-	30 (Annual) 80 (24-hr) 200 (1-hr)
CO	Industrial Residential, Rural and Other Areas	2,000 (8-hr) 4,000 (1-hr)	-	10,000 (8-hr) 100,000 (15-min)	2,000 (8-hr) 4,000 (1-hr) 100,000 (15-min)
	Sensitive Area	2,000 (8-hr) 4,000 (1-hr)	-	10,000 (8-hr) 100,000 (15-min)	2,000 (8-hr) 4,000 (1-hr) 100,000 (15-min)
Ozone (O_3)	Industrial Residential, Rural and Other Areas	100 (8-hr) 180 (1-hr)	100 (8-hr)		100 (8-hr) 180 (1-hr)
	Sensitive Area	100 (8-hr) 180 (1-hr)	100 (8-hr)		100 (8-hr) 180 (1-hr)
Lead (Pb)	Industrial, Residential, Rural and Other Areas	0.5 (Annual) 1.0 (24-hr)		0.5 (Annual)	0.5 (Annual) 1.0 (24-hr)
	Sensitive Area	0.5 (Annual) 1.0 (24-hr)		0.5 (Annual)	0.5 (Annual) 1.0 (24-hr)
Ammonia (NH_3)	Industrial Residential, Rural and Other Areas	100 (Annual) 400 (24-hr)			100 (Annual) 400 (24-hr)

Parameter	Location [a]	India Ambient Air Quality Standard [b] ($\mu g/m^3$)	WHO Air Quality Guidelines ($\mu g/m^3$)		Applicable Per ADB SPS[e] ($\mu g/m^3$)
			Global Update [c] 2005	Second Edition 2000	
	Sensitive Area	100 (Annual) 400 (24-hr)			100 (Annual) 400 (24-hr)
Benzene (C_6H_6)	Industrial Residential, Rural and Other Areas	5 (Annual)			5 (Annual)
	Sensitive Area	5 (Annual)			5 (Annual)
Benzo(o)pyrene (BaP) particulate phase only	Industrial Residential, Rural and Other Areas	0.001 (Annual)			0.001 (Annual)
	Sensitive Area	0.001 (Annual)			0.001 (Annual)
Arsenic (As)	Industrial Residential, Rural and Other Areas	0.006 (Annual)			0.006 (Annual)
	Sensitive Area	0.006 (Annual)			0.006 (Annual)
Nickel (Ni)	Industrial Residential, Rural and Other Areas	0.02 (Annual)			0.02 (Annual)
	Sensitive Area	0.02 (Annual)			0.02 (Annual)

Note-

[a] Sensitive area refers to such areas notified by the India Central Government.

[b] Notification by Ministry of Environment and Forests, Government of India Environment (Protection) Seventh Amendment Rules, 2009

[c] WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide. *Global update 2005*. WHO. 2006

[d] Air Quality Guidelines for Europe Second Edition. WHO 2000.

[e] Per ADB SPS, the government shall achieve whichever of the ambient air quality standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS

Appendix C-3: Emission limits for New DG sets up to 800 KW
(As per Environment (Protection) (Third Amendment) Rules, 2013)

TABLE

Power Category	Emission Limits (g/kW-hr)			Smoke Limit (light absorption coefficient, m^{-1})
	NOx +HC	CO	PM	
Upto 19 KW	≤ 7.5	≤ 3.5	≤ 0.3	≤ 0.7
More than 19 KW upto 75 KW	≤ 4.7	≤ 3.5	≤ 0.3	≤ 0.7
More than 75 KW upto 800 KW	≤ 4.0	≤ 3.5	≤ 0.2	≤ 0.7

Note:

1. The abbreviations used in the Table shall mean as under: NO_x – Oxides of Nitrogen; HC – Hydrocarbon; CO – Carbon Monoxide; and PM – Particulate Matter.
2. Smoke shall not exceed above value throughout the operating load points of the test cycle.
3. The testing shall be done as per D2 – 5 mode cycle of ISO: 8178- Part 4.
4. The above mentioned emission limits shall be applicable for Type Approval and Conformity of Production (COP) carried out by authorised agencies.
5. Every manufacturer, importer or, assembler (hereinafter referred to as manufacturer) of the diesel engine (hereinafter referred to as 'engine') for genset application manufactured or imported into India or, diesel genset (hereinafter referred to as 'product'), assembled or imported into India shall obtain Type Approval and comply with COP of their product(s) for the emission limits which shall be valid for the next COP year or, the date of implementation of the revised norms specified above, whichever earlier.

   Explanation.- The term 'COP year' means the period from 1st April to 31st March.
6. Stack height (in metres), for genset shall be governed as per Central Pollution Control Board (CPCB) guidelines.

Appendix C-4: Stack Height Requirement of DG set

DIESEL GENERATOR SETS : STACK HEIGHT

The minimum height of stack to be provided with each generator set can be worked out using the following formula :

H = h+0.2x ÖKVA
H = Total height of stack in metre
h = Height of the building in metres where the generator set is installed
KVA = Total generator capacity of the set in KVA
Based on the above formula the minimum stack height to be provided with different range of generator sets may be categorised as follows:

For Generator Sets	Total Height of stack in metre
50 KVA	Ht. of the building + 1.5 metre
50-100 KVA	Ht. of the building + 2.0 metre
100-150 KVA	Ht. of the building + 2.5 metre
150-200 KVA	Ht. of the building + 3.0 metre
200-250 KVA	Ht. of the building + 3.5 metre
250-300 KVA	Ht. of the building + 3.5 metre

Similarly for higher KVA ratings a stack height can be worked out using the above formula.

Source : Evolved By CPCB
[Emission Regulations Part IV:COINDS/26/1986-87]

Appendix C-5: Vehicle Exhaust Emission Norms

1**. Passenger Cars**

Norms	**CO(g/km)**	**HC+ NOx(g/km)**
1991Norms	14.3-27.1	2.0(Only HC)
1996 Norms	8.68-12.40	3.00-4.36
1998Norms	4.34-6.20	1.50-2.18
India stage 2000 norms	2.72	0.97
Bharat stage-II	2.2	0.5
Bharat Stage-III	2.3	0.35 (combined)
Bharat Stage-IV	1.0	0.18 (combined)

2. **Heavy Diesel Vehicles**

Norms	**CO(g/kmhr)**	**HC (g/kmhr)**	**NOx (g/kmhr)**	**PM(g/kmhr)**
1991Norms	14	3.5	18	-
1996 Norms	11.2	2.4	14.4	-
India stage 2000 norms	4.5	1.1	8.0	0.36
Bharat stage-II	4.0	1.1	7.0	0.15
Bharat Stage-III	2.1	1.6	5.0	0.10
Bharat Stage-IV	1.5	0.96	3.5	0.02

Source: Central Pollution Control Board

CO = Carbon Monoxide; g/kmhr = grams per kilometer-hour; HC = Hydrocarbons; NOx = oxides of nitrogen; PM = Particulates Matter

Appendix C-6: Ambient Noise Quality Standards

Receptor/ Source	India National Noise Level Standards[a] (dBA)		WHO Guidelines Value For Noise Levels Measured Out of Doors[b] (One Hour LA_q in dBA)		Applicable Per ADB SPS[c] (dBA)	
	Day	**Night**	**07:00 – 22:00**	**22:00 – 07:00**	Day time	Night time
Industrial area	75	70	70	70	70	70
Commercial area	65	55	70	70	65	55
Residential Area	55	45	55	45	55	45
Silent Zone	50	40	55	45	50	40

Note-

[a] Noise Pollution (Regulation and Control) Rules, 2002 as amended up to 2010.

[b] Guidelines for Community Noise. WHO. 1999

[c] Per ADB SPS, the government shall achieve whichever of the ambient quality standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

Appendix C-7: Noise Limits for DG Set

(Noise Limit for Generator Sets run with Diesel were notified by Environment (Protection) second Amendment Rules vide GSR 371(E), dated 17th May 2002 at serial no.94 and its amendments vide GSR No 520(E) dated 1st July 2003; GSR 448(E), dated 12th July 2004; GSR 315(E) dated 16th May 2005; GSR 464(E) dated 7th August 2006; GSR 566(E) dated 29th August 2007 and GSR 752(E) dated 24th October 2008; G.S.R. 215 (E), dated 15th March, 2011 under the Environment (Protection) Act, 1986)

Noise Limit for Generator Sets run with Diesel

1. **Noise limit for diesel generator sets (upto 1000 KVA) manufactured on or after the 1st January, 2005**

   The maximum permissible sound pressure level for new diesel generator (DG) sets with rated capacity upto 1000 KVA, manufactured on or after the 1st January, 2005 shall be 75 dB(A) at 1 metre from the enclosure surface.

   The diesel generator sets should be provided with integral acoustic enclosure at the manufacturing stage itself.

   The implementation of noise limit for these diesel generator sets shall be regulated as given in paragraph 3 below.

2. **Noise limit for DG sets not covered by paragraph 1.**

   Noise limits for diesel generator sets not covered by paragraph 1, shall be as follows:-

   2.1 Noise from DG set shall be controlled by providing an acoustic enclosure or by treating the room acoustically, at the users end.

   2.2 The acoustic enclosure or acoustic treatment of the room shall be designed for minimum 25 dB (A) insertion loss or for meeting the ambient noise standards, whichever is on the higher side (if the actual ambient noise is on the higher side, it may not be possible to check the performance of the acoustic enclosure/acoustic treatment. Under such circumstances the performance may be checked for noise reduction upto actual ambient noise level, preferably, in the night time). The measurement for Insertion Loss may be done at different points at 0.5 m from the acoustic enclosure/ room, then averaged.

   2.3 The DG set shall be provided with proper exhaust muffler with insertion loss of minimum 25 dB (A).

2.4 These limits shall be regulated by the State Pollution Control Boards and the State Pollution Control Committees.

2.5 Guidelines for the manufacturers/ users of Diesel Generator sets shall be as under:-

01. The manufacturer shall offer to the user a standard acoustic enclosure of 25 dB (A) insertion loss and also a suitable exhaust muffler with insertion loss of 25 dB(A).
02. The user shall make efforts to bring down the noise levels due to the DG set, outside his premises, within the ambient noise requirements by proper citing and control measures.
03. Installation of DG set must be strictly in compliance with the recommendations of the DG set manufacturer.
04. A proper routine and preventive maintenance procedure for the DG set should be set and followed in consultation with the DG set manufacturer which would help prevent noise levels of the DG set from deteriorating with use.

3.0 Limits of Noise for DG Sets (upto 1000 KVA) Manufactured on or after the 1st January, 2005

3.1 Applicability

01. These rules apply to DG sets upto 1000 KVA rated output, manufactured or imported in India, on or after 1st January, 2005.

02. These rules shall not apply to –

a) DG sets manufactured or imported for the purpose of exports outside India; and

b) DG sets intended for the purpose of sample and not for sale in India.

3.2 Requirement of Certification

Every manufacturer or assembler or importer (hereinafter referred to as the "manufacturer") of DG set (hereinafter referred to as "product") to which these regulations apply must have valid certificates of Type Approval and also valid certificates of Conformity of Production for each year, for all the product models being manufactured or assembled or imported from 1st January, 2005 with the noise limit specified in paragraph 1.

3.3 Sale, import or use of DG sets not complying with the rules prohibited

No person shall sell, import or use of a product model, which is not having a valid Type Approval Certificate and Conformity of Production certificate.

Appendix C-8: Effluent Discharge Standards for Sewage Treatment Plant

Discharge Standards to be achieved as per NGT order dtd. 30.04.2019

Sl. No.	Parameters	Parameters Limit
1	pH	5.5-9.0
2	BOD (mg/l)	Not more than 10 mg/l
3	COD (mg/l)	Not more than 50 mg/l
4	TSS (mg/l)	Not more than 20 mg/l
5	P-Total (mg/l)- for discharge into ponds/lakes	Not more than 1.0 mg/l
6	N-Total (mg/l)	Not more than 10 mg/l
7	Fecal Coliform (MPN/100ml)	Desirable- Less than 100 MPN/100ml Permissible- 230 MPN/100ml

Note: These parameters are being followed under RSTDSP works

Appendix C-9: Pages from Rajasthan State Sewerage and Waste Water Policy for reuse of treated effluent and sludge

viii. Design and performance specifications of wastewater treatment plants shall be as per guidelines given in the manual on sewerage treatment systems published by CPHEEO. Sufficient room in tendering for the construction of new plants shall be provided for competition to take place in both technologies and costs.

5.4. On Reuse of Treated Effluent and Sludge

1. Treated wastewater effluent is considered a water resource and is added to the water stock for reuse.
2. Priority shall be given to agricultural reuse of treated effluent for unrestricted irrigation. Blending of treated wastewater with fresh water shall be made to improve quality where possible. Crops to be irrigated by the treated effluent or blend thereof with freshwater resources shall be selected to suit the irrigation water, soil type and chemistry, and the economics of the reuse operations.
3. Crop nutrient requirements shall be determined taking into consideration the prevailing effluent quality. Overuse of nutrients shall be avoided.
4. Accumulation of heavy metals and salinity shall be monitored, managed and mitigated. Leaching of soils shall be advocated by the irrigation authorities.
5. Farmers shall be encouraged to determine the rate of water application needed for different crops, taking into consideration the value of nutrients in the treated water and other parameters.
6. Farmers shall be encouraged to use modern and efficient irrigation technologies. Protection of on-farm workers and of crops against pollution with wastewater shall be ensured.
7. Treated effluent quality should be monitored and users alerted to any emergency causing deterioration of the quality so that they will not use such water unless corrective measures are taken.
8. Studies should be conducted and projects designed and implemented to store the excess treated wastewater in surface reservoirs but artificial recharge is not permitted . Due attention shall be given to the quality of treated and groundwater and the characteristics of the strata.
9. Plans and studies for power generation from sludge, if proven technically, economically and financially feasible, shall be made with due attention to environment impacts.
10. Sludge produced from the treatment process would be processed so it may be used as fertilizer and soil conditioner. Care shall be taken to conform to the regulations of public health and environment protection norms.

11. **Industry:** Industrial reuse of reclaimed wastewater represents major reuse next only to irrigation in both developed and developing countries. Reclaimed wastewater is ideal for many industrial purposes,. Where effluent is to be used in the industrial processes, it should be the responsibility of the industry to treat it to the quality standards required. Pilot scale feasibility studies carried out in Australia have concluded that it is possible to economically treat the domestic wastewater to achieve adequate quality for reuse as cooling water. Based on the conclusions of the feasibility study, a full-scale treatment plant employing cross-flow membrane microfiltration system may be installed. The membrane filtration system can remove all suspended solids, fecal coliforms, and giardia cysts. It could also significantly reduce human enteric viruses such as *reovirus*and *enterovirus*. The water reclamation plant at Eraring Power Station demonstrates the potential for reuse of wastewater in power generation and other industrial manufacturing facilities.

Industrial uses for reclaimed water include:

(i) Evaporative cooling water:-

- (a) Once-through cooling system.
- (b) Re-circulating cooling system.
- (c) Cooling water quality requirements.

(ii) Boiler –Feed water- The use of reclaimed water differs little from use of conventional public supplies for boiler-feed water,as both require extensive additional treatment quality requirement for boiler feed make up water are dependent upon pressure at which boiler is operated.

(iii) Industrial process water-

Suitability of reclaimed water for use in industrial process depends upon particular use like-

- (a) Pulp and paper.
- (b) Chemical industry.
- (c) Textile industry.
- (d) Petroleum and coal.

12. Whenever possible, other end uses of treated effluents; such as recycling, cooling, power generation, etc. shall be considered.

13. Re-use Options: The following options for re–use of effluent have been identified: In general, public health concern is the major issue in any type of reuse of wastewater, be it for irrigation or non-irrigation utilization, especially long term impact of reuse practices. It is difficult to delineate acceptable health risks and is a matter that is still hotly debated. Potential reuse of wastewater depends on the hydraulic and biochemical characteristics of wastewater, which determine the methods and degree of treatment required. While agricultural irrigation reuses, in general, require lower quality levels of treatment, domestic reuse options (direct or indirect potable and non-potable) reuses need the highest treatment level. Level of treatment for other

reuse options lie between these two extremes. The reuse options may be (artificial recharge of aquifers is not permitted):

i. Irrigation

(a) Agriculture and forestry

(b) Landscaping

ii. Fish – farming

iii. Industry

iv. Non-potable Domestic Reuse.

The detailed project report should clearly define the best reuse option particular to town and strategy to obtain it. Action plan with clarity should be the part of Detailed Project Report (DPR), while preparing sewerage projects. Before deciding the reuse of treated waste water, authorities must full fill the water quality norms and its legal implications.

14. Governing local body can sell the treated waste water and digested sludge to generate the revenue.

5.5. On Pricing, Financing and Investment

1. In view of increasing marginal cost of wastewater collection and treatment, wastewater charges, connection fees, sewerage taxes and treatment fees shall be set to cover at least the operation and maintenance costs. It is also highly desirable that part of the capital cost of the services shall be recovered. The ultimate aim is for a full cost recovery.

2. Appropriate criteria in order to apply the "polluter pays" principle shall be established.

3. Different charges for different areas may be applied. This shall be assessed for each geographical area as a function of end users and effluent quality and will be subject to economic and social considerations.

4. Because of the limited financial resources available to Government of Rajasthan, setting investment priorities in wastewater will be compatible with government investment plans.

5. Criteria for prioritizing investments in the wastewater sector shall take into account the current and future needs of the state, needs to expand wastewater systems in urban areas and to provide wastewater systems to smaller towns and villages.

6. Priorities of wastewater projects shall not be disconnected from water supply projects and urbanization in general. Decisions will be made concerning them to attain optimum solutions to the need for services, availability of finance and availability of trained manpower.

7. Treated effluent shall be priced and sold to end users at a price covering at least the operation and maintenance costs of delivery.

8. It is the intention of the Government, through private sector participation, to transfer management of infrastructure and services from the public to the private sector, in order to improve performance and upgrade the level of service.

9. The role of the private sector will expand with management contracts, concessions and other forms of private sector participation in wastewater management.

10. The concepts of BOO/BOT shall be entertained, and the impact of such concepts on the consumers shall be continually addressed and negative impacts mitigated.

11. The private sector role in reuse of treated effluent shall be encouraged and expanded.

12. As per urban reforms (under various schemes by MOUD) 100% cost of O&M of sewerage system shall be recovered from consumer. The costs will depend on the system/technology adopted for collection of sewerage and treatment and the administration costs. It is important that the full cost of the service is assessed for each urban area instead of adopting a typical cost assessment. The full cost shall cover the following:

(i) Institutional aspect of the sanitation service e.g. the management information systems, accountancy and finance management, billing and collection, customer services, etc. and oversight activities.

(ii) Operating, maintaining (on a planned maintenance basis), repairing replacing and extending sanitation service physical infrastructure.

(iii) Keeping updated infrastructure and customer data on a GIS base.

(iv) Managers, staff, vehicles, equipment and consumables associated with the above.

(v) Consumable like chemicals etc.

(vi) Power charges.

(vii) Spare Parts.

(viii) Any other O&M contract amount

5.6. Source of Funds for Sewerage Project

(A) In general, implementation of reuse facility requires substantial capital expenses. In addition to capital cost associated with reclaimed water facility, there are also additional operation, maintenance, and replacement and administrative costs. Hence responsible agencies may consider following sources of 'Funds for Construction of Sewerage Project':

Appendix C-10: Guidelines for Reuse of Treated Effluent and Sludge from STP for Beneficial Purposes
(Source: Manual on Sewerage and Sewage Treatment Systems, CPHEEO, Ministry of Urban Development, Govt. of India)

Health Hazards during Sewage Operations

Labourers working on the sewage treatment and operations may suffer from a number of aliments directly attributed to handling of sewage. In view of this it is desirable to disinfect sewage and where feasible mechanize sewage operations.

The staff of sewage operations must be well educated in the sanitary rules on the utilization of sewage for irrigation as well as with personal hygiene. All persons working in sewage farms must undergo preventive vaccination against enteric infections and annual medical examination for helminthiases and be provided treatment if necessary.

Sewage treatment plants should be provided with adequate space for canteens with proper sanitation, wash-stands and lockers for irrigation implements and protective clothing. Safe drinking water must be provided for the workers and for population residing within the effective range of the sewage treatment plants.

All workers should be provided with gum boots and rubber gloves, which must compulsorily be worn while at work. They should be forced to observe personal hygiene such as washing after work as well as washing before taking food. The use of antiseptics in the water used for washing should be emphasized. The farm worker should be examined medically at regular intervals and necessary curative measures enforced.

Mitigation measures to avoid Health Hazards

Personal Hygiene against Pathogen

The worker should take precautions because a large number of coliform groups, various kinds of micro-organisms, and egg parasites exist in sewage. The workers should strive to maintain good health by taking care of the following points:

- Wear clean uniform, work boots, etc.
- After work and before having a meal, always wash hands and disinfect them.
- After work, take a shower if possible.
- Do not enter the offices and lounges wearing dirty clothes.
- If necessary, take vaccinations against tetanus, leptospirosis fever and so on

Maintaining Cleanliness The worker should maintain each facility in a clean and neat condition.

- The flors of workrooms, stairs and corridors should be cleaned at the appropriate frequency to maintain them in a clean condition
- Disinfection of relevant locations is to be carried out periodically.

Health Check Workers should receive health check once a year to maintain their health, and prevent illnesses or detect them at an early stage. The results of the health check should be maintained as records. Recommended items to be inspected during the health check are as given below.

- Examine medical history.
- Examine subjective symptoms and other objective symptoms.
- Check height, weight, vision and hearing ability.
- Chest X-ray examination.
- Blood pressure measurement.
- Check for anaemia.
- Check for liver functions.
- Check for lipids in blood.
- Check blood sugar level
- Urine analysis.
- Electrocardiogram analysis

Welfare Measures The Sanitation Workers (Regulation of Employment and Conditions of Service) Act 2012 proposes constitution of a Sanitation Workers State Welfare Board to exercise powers conferred on it and to perform welfare functions such as the following for sanitation workers:

- Provide immediate assistance to a beneficiary in case of an accident
- Sanction of loan and advances
- Medical expenses for treatment of major ailments
- Financial assistance for education of children
- Payment of maternity benefits
- Make provision and improvement of welfare measures and facilities as may be prescribed

Corrective Measures When a worker has symptoms of an illness listed above, the plant engineer should ensure that the worker is checked-up by a specialist doctor and receives proper treatment and care and should take the following actions considering the content of work done by the worker:

- Change the workplace if necessary
- Change the content of the work
- Shorten the working hours
- Perform relevant measurements of the working environment
- Maintain the facility or equipment

Risks in use of treated effluent and sludge in agriculture practices

Cultivation of crops that are eaten raw should be banned. Cultivation of paddy in bunded fields is likely to give rise to sanitation problems and hence is undesirable. Growing of non-edible commercial crops like cotton, jute, fodder, milling varieties of sugarcane and tobacco would be suitable. Cultivation of grasses and fodder legumes, medicinal and essential oil yielding plants like menthol and citronella may be allowed. Cultivation of cereals, pulses, potatoes and other crops that are cooked before consumption may be permitted, if sewage is treated and care is taken in handling the harvests to ensure that they are not contaminated. Cultivation of crop exclusively under seed multiplication programmes would be advantageous as these are not consumed. As an additional safeguard, sewage irrigation should be discontinued at least two months in advance of harvesting of fruits and berries, one month for all kinds of vegetables and a fortnight for all other crops. Direct grazing on sewage irrigated farms should be prohibited.

Risks of Nutrient Loading in Agriculture

Crops receiving excessive dosage of nitrogen show superflous vegetative growth and decrease in grain or fruit yield. The phosphate deficit of sewage, therefore, should be made good by supplementing with phosphate fertilizers, the extent of phosphate fortification depending upon the nature of crop and its phosphate requirements. As the availability of phosphate is low in the irrigation water it would be desirable to apply the required quantity of phosphatic fertilizer at the time or even (about a fortnight) before the sowing or planting of the crop. Even when sewage nutrients are balanced by fortification, irrigation with such sewage may supply excessive amount of nutrients resulting in waste or unbalanced growth of plants with adverse effects on yields. It may therefore be necessary to dilute the sewage. Dilution also helps in reducing the concentration of dissolved salts and decomposable organic matter in the sewage thus, decreasing hazards to the fertility of the soil. It is desirable to limit the BOD and total suspended solids of sewage to be disposed on land for irrigation, as per relevant standards. There is a need to take caution on describing nutrient supply capacity of sewage particularly in the case of availability of phosphorus because there is a possible conversion of available phosphorus in unavailable mode in the presence of heavy metals present in the sewerage. This happens commonly in high as well as low pH soils.

Alternative Arrangement during Non-irrigating Periods

During rainy and non-irrigating seasons, agricultural practices may not need any water for irrigation. Even during irrigating season, the water requirement fluctuates significantly. Hence,

satisfactory alternative arrangements have to be made for the disposal of sewage on such occasions either by storing the excess sewage or discharging it elsewhere without creating environmental hazards. The following alternatives are generally considered: a) Provision of holding lagoons for off-season storage. They enable irrigation of a fied area of land to varying rates of crop demand. They may also serve as treatment units such as aerated or stabilization lagoons, provided the minimum volume required for treatment is provided beyond the flow-balancing requirement. b) Provision of additional land where treated sewage is not required on the main plot of land c) Discharge of surplus treated sewage to river or into sea with or without additional treatment. Combining surface discharge facilities with irrigation system is quite common and often quite compatible. d) Resorting to artificial recharge in combination with an irrigation system where feasible.

Treated Sewage into Perennial Rivers

When sewage is treated and discharged into perennial flowing rivers and the blended river water is drawn downstream of the point of such blending as raw water for treatment in public water supply schemes. This is indirect potable use after blending. This is historical and ongoing all around. However, of late, the organic load due to the discharged treated, partially treated and non-point sewage becomes in excess of the self-purifying capacity of the river. Thus, the river water is not actually fresh water. The water quality of Yamuna river for Agra water supply scheme requires to be fist treated in MBBR to purify the river water to a level as raw water for the downstream WTP. When it passes through flowing surface water it has the potential disadvantages of contamination by human and animal activities adding organic matter and waterborne pathogens unless the river stretch is protected from such activities. The guiding principle in such cases for the ULBs will be to at least intercept the sewage outfalls and provide adequate STPs and follow the recommended quality criteria for the treated sewage.

Treated Sewage into Non-Perennial / Dry River Courses

There are locations where the rivers are not perennial or almost dry throughout the year except some monsoon runoff. In this case the discharged treated sewage sinks into the aquifer zone and is extracted by infiltration wells or galleries. The advantage of direct dilution from surface water is lost, but the additional purification in the soil and dilution from the aquifer water are happening. An example is the case of the Palar river course in Tamilnadu. The surface water flow in this occurs only for about a week if the monsoon is normal and if the water spills beyond the upstream impoundments. The aquifer however supports the public water supply of over 30 habitations along its dry tract of nearly 80 km before the sea. The partly treated sewage of the en-route habitations does reach this river course as intervals. So far, no epidemics have been met with. This may be due to the above said additional purification in the soil and dilution by aquifer water. However, if these are exceeded by the contamination load, there can be immediate health problems. The guiding principle in such cases for the ULBs will be (a) to keep a check on the raw water quality from the infiltration wells to detect sudden increase in contaminants and (b) at least intercept the sewage outfalls and provide adequate STPs.

Appendix C-11: Guidelines for compensatory tree plantation in RUIDP works

RUIDP
Office of RUDSICO, External Aided Project (RUIDP)
Rajasthan Urban Drinking Water Sewerage and Infrastructure Corporation Ltd (RUDSICO)
{Erstwhile Rajasthan Urban Infrastructure Finance and Development Corporation Ltd}
Head Quarter Address:- Old Working Women Hostel, Behind Nehru Palace, Tonk Road Jaipur
Branch Address: - AVS Building, Jawahar Circle, JLN Marg, Jaipur - 302017
Ph. - 141 2721966 Fax No. 141 2721919,
E-mail:- mailruidp@gmail.com, mail.ruidp@rajasthan.gov.in Website: - www.ruidp.rajasthan.gov.in

No. F3 (201)(57)/RUIDP/PMU/Ph-III/CMS/ 556

Date: 13.04.2018

Sub: Construction Management System: Circular – 10
Ref: Guidelines for Compensatory Tree Plantation in RUIDP works.

RUIDP being a responsible organization in the sector of Urban Infrastructure understands the need & responsibility towards protection and conservation of Environment. It is mandatory in all RUIDP projects to avoid tree cutting during construction activities, however, in some unavoidable cases tree cutting may be allowed subjected to following conditions : -

1. Submission of detailed proposal by contractor indicating number of trees required to be cut with justification and details of efforts made to avoid/minimize tree cutting.
2. Tree cutting should be allowed by PIU/Employer Representative only after permission from concerned authorities (Administration/ Tahsildar/ Forest Department as the case may be).
3. Compensatory plantations should be ensured/ done by contractor in sufficient number of trees so that final survived trees should meet criteria of 1:3 (three trees should be planted for every one tree cut). This ratio is a minimum requirement; additional plantation by contractor should be encouraged. The ratio shall also be got approved by concerned permitting authority.
4. Compensatory plantations can be done in any of project sites (if space available) or any other place in the town after due permission from land owner/concerned department and PIU.
5. Tree species selected for compensatory plantations should be native (local) species and list of such species should be obtained/ verified from Forest Department of concerned town prior to submission of proposal for tree cutting.
6. Trees proposed to be planted should be at least of 3 mtrs height and in healthy condition.
7. It shall be responsibility of contractor to ensure the survival of planted trees upto 5/10 years i.e. for entire O&M period.
8. After completion of Contract period and before handing over project for O&M, all the trees should be counted by PIU through consultants and handed over to Municipality/asset owner/concerned department through PIU.

9. Compensatory plantation is an additional obligation (deemed to be accepted by all parties) and should not be considered as replacement/substitution of any pre-existing contractual obligation/ conditions. Compensatory plantation obligations will be additional to Pre defended mandatory plantations for sites in contract.
10. Payments for this Compensatory plantation shall be done from provisional sum of contract and rates shall be taken from RUIDP SOR for the available items and market rate analysis for other items.

This circular shall be strictly abided by all the members of PIU, PMDSC, PSC & Contractor.

(Dr. Preetam B Yashvant)
Project Director

No. F3 (201)(57)/RUIDP/PMU/Ph-III/CMS/ 5971 Date: 13.04.2018

Copy to following for information and necessary action:

1. PA to PD/Addl. PD/ FA/ CE/ ACE/SE-I/SE-II/SE-III/ POs/APOs, PMU, RUIDP, Jaipur
2. SE, PIU, Pali/Tonk/Sriganaganagar/Jhunjhunu/Bhilwara/Hanumangarh/Kota
3. EE, PIU, Sawai Madhopur/ Bikaner/ Udaipur/ Jhalawar/ Mt. Abu/Banswara
4. Team Leader/ Project Coordinator/CM/ Dy. CM/ACM, PMDSC/ PSC, Jaipur, Pali/ Tonk/ Sriganaganagar/ Jhunjhunu/ Bhilwara/ Hanumangarh/ Kota/ Sawai Madhopur/ Bikaner/ Udaipur/ Jhalawar/ Mt. Abu/Banswara
5. ACP, RUIDP, Jaipur to send by e-mail and put up the Guidelines on the website.

Addl. Chief Engineer

Appendix C-12: Salient Features of Laws applicable to Construction Works including Labor Laws

(i) Workmen Compensation Act, 1923 - The Act provides for compensation in case of injury by accident arising out of and during the course of employment.
(ii) Payment of Gratuity Act, 1972 - Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years' service or more or on death at the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.
(iii) Employees' PF and Miscellaneous Provisions Act, 1952 - The Act provides for monthly contributions by the employer plus workers @10 % or 8.33 %.The benefits payable under the Act are: (a) Pension or family pension on retirement or death as the case may be; (b) deposit linked insurance on the death in harness of the worker; (c) payment of PF accumulation on retirement/death etc.
(iv) Maternity Benefit Act, 1951 (as amended up to 2017) - The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.
(v) Contract Labour (Regulation and Abolition) Act, 1970 - The Act provides for certain welfare measures to be provided by the Contractor to contract labor and in case the Contractor fails to provide, the same are required to be provided by the Principal Employer by Law.The principal employer is required to take Certificate of Registration and the Contractor is required to take a License from the designated Officer. The Act is applicable to the establishments or Contractor of principal employer if they employ 20 or more contract labor.
(vi) Minimum Wages Act, 1948 - The employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of Buildings, Roads, Runways are scheduled employment.
(vii) Payment of Wages Act, 1936 - It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.
(viii) Equal Remuneration Act, 1979 - The Act provides for payment of equal wages for work of equal nature to Male and Female workers and not for making discrimination against Female employees in the matters of transfers, training and promotions etc.
(ix) Payment of Bonus Act, 1965 - The Act is applicable to all establishments employing 20 or more workmen. The Act provides for payments of annual bonus subject to a minimum of 8.33 % of wages and maximum of 20 % of wages to employees drawing Rs. 3,500/- per month or less. The bonus to be paid to employees getting Rs. 2,500/- per month or above up to Rs.3,500/- per month shall be worked out by taking wages as Rs.2,500/- per month only. The Act does not apply to certain establishments. The newly set up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of the Act.
(x) Industrial Disputes Act, 1947 - The Act lays down the machinery and procedure for resolution of industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.
(xi) Industrial Employment (Standing Orders) Act, 1946 - It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the employer on matters provided in the Act and get the same certified by the designated Authority.
(xii) Trade Unions Act, 1926 - The Act lays down the procedure for registration of trade unions of workmen and employees. The trade unions registered under the Act have been given certain immunities from civil and criminal liabilities.

(xiii) Child Labor (Prohibition and Regulation) Act, 1986 - The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of child labor is prohibited in Building and Construction Industry.

(xiv) Inter-State Migrant Workmen's (Regulation of Employment and Conditions of Service) Act, 1979 - The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state).The inter-state migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home up to the establishment and back, etc

(xv) **Construction and Demolition Waste Management Rules 2016-** This Rule stipulate that-

- Every waste generator shall segregate construction and demolition waste and deposit at collection centre or handover it to the authorized processing facilities
- Shall ensure that there is no littering or deposition so as to prevent obstruction to the traffic or the public or drains.
- Large generators (who generate more than 20 tons or more in one day or 300 tons per project in a month) shall submit waste management plan and get appropriate approvals from the local authority before starting construction or demolition or remodelling work,
- Large generators shall have environment management plan to address the likely environmental issues from construction, demolition, storage, transportation process and disposal / reuse of C & D Waste.
- Large generators shall segregate the waste into four streams such as concrete, soil, steel, wood and plastics, bricks and mortar,
- Large generators shall pay relevant charges for collection, transportation, processing and disposal as notified by the concerned authorities;

(xvi) **Solid Waste Management Rules 2016-** As per this Rule, responsibility of Solid Waste Generator is as below-

- segregate and store the waste generated in three separate streams namely bio-degradable, non-biodegradable and domestic hazardous wastes in suitable bins and handover segregated wastes to authorized waste pickers or waste collectors as per the direction or notification by the local authorities from time to time;
- store separately construction and demolition waste, as and when generated, in his own premises and shall dispose off as per the Construction and Demolition Waste Management Rules, 2016; and
- No waste generator shall throw, burn or burry the solid waste generated by him, on streets, open public spaces outside his premises or in the drain or water bodies.

(xvii) **The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and the Cess Act of 1996 -** All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under this Act. All such establishments are required to pay Cess at rate not exceeding 2% of the cost of construction as may be notified by the Government. The employer of the establishment is required to provide safety measures at the building or construction work and other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodation for workers near the workplace etc. The employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government. Following are the major requirements under this Act, applicable to this project-

Employer shall-

- Provide and maintain, at suitable point, sufficient quantity of wholesome drinking water, such point shall be at least 6 meters away from any washing areas, urinals or toilets
- Provide sufficient urinals and latrines at convenient place, easily accessible by workers
- Provide free of charge, temporary living accommodations near to work sites with separate cooking place, bathing and lavatory facilities and restore the site as pre conditions after completing the construction works
- Provide crèche with proper accommodation, ventilation, lighting, cleanliness and sanitation if more than fifty female workers are engaged
- Provide first aid facilities in all construction sites

For safety of workers employer shall provide-

- Safe access to site and work place
- Safety in demolition works
- Safety in use of explosives
- Safety in operation of transporting equipments and appoint competent person to drive or operate such vehicles and equipments
- Safety in lifting appliance, hoist and lifting gears
- Adequate and suitable lighting to every work place and approach
- Prevention of inhalation of dust, smoke, fumes, gases during construction works and provide adequate ventilation in work place and confined space
- Safety in material handling and stacking/un stacking
- Safeguarding the machinery with fly-wheel of moving parts
- Safe handling and use of plants operated by compressed air
- Fire safety
- Limit of weight to be lifted by workers individually
- Safety in electric wires, apparatus, tools and equipments
- Provide safety net, safety sheet, safety belts while working at height (more than1.6 mtrs as per OSHA)
- Providing scaffolding, ladders and stairs, lifting appliances, chains and accessories where required
- Safety in pile works, concrete works, hot asphalt, tar, insulation, demolition works, excavation, underground construction and handling materials
- Provide and maintain medical facilities for workers
- Any other matters for the safety and health of workers

(xviii) **The Occupational Safety, Health and Working Conditions Code, 2020**: The Occupational Safety, Health And Working Conditions Code, 2020 is a code to consolidate and amend the laws regulating the Occupational safety and health and working conditions of the persons employed in an establishment and for matters connected therewith or incidental thereto. This Code simplifies, amalgamates and rationalises the provisions of the different enactments with certain important changes which, inter alia, are as under:—

- To impart flexibility in adapting technological changes and dynamic factors, in the matters relating to health, safety, welfare and working conditions of workers;
- To apply the provisions of the proposed Code for all establishments having ten or more workers, other than the establishments relating to mines and docks;
- To provide the concept of “one registration” for all establishments having ten or more employees. However, for the applicability of all other provisions of the Code in respect of factories, except registration, the threshold has been fixed twenty workers in a factory (with power) and forty workers (without power);

- To include the journalist working in electronic media such as in e-paper establishment or in radio or in other media in the definition of “working journalists”;
- To provide for issuing of appointment letter mandatorily by the employer of an establishment to promote formalisation in employment;
- To provide free of cost annual health check-ups for employees above the specified age in all or certain class of establishments by which it would be possible to detect diseases at an early stage for effective and proper treatment of the employees;
- To make the provisions relating to Inter-State Migrant Workers applicable on the establishment in which ten or more migrant workers are employed or were employed on any day of the preceding twelve months and also provide that a Inter-State Migrant may register himself asan Inter-State Migrant Worker on the portal on the basis of self-declaration and Aadhaar;
- An Inter-State Migrant Worker has been provided with the portability to avail benefits in the destination State in respect of ration and availing benefits of building and other construction worker cess;
- To constitute the National Occupational Safety and Health Advisory Board to give recommendations to the Central Government on policy matters, relating to occupational safety, health and working conditions of workers;
- To constitute the State Occupational Safety and Health Advisory Board at the State level to advice the State Government on such matters arising out of the administration of the proposed Code;
- To make a provision for the constitution of Safety Committee by the appropriate Government in any establishment or class of establishments;
- To employ women in all establishments for all types of work. They can also work at night, that is, beyond 7 PM and before 6 AM subject to the conditions relating to safety, holiday, working hours and their consent;
- To make provision of “common license” for factory, contract labour and beedi and cigar establishments and to introduce the concept of a single all India license for a period of five years to engage the contract labour;
- To enable the courts to give a portion of monetary penalties up to fifty per cent. to the worker who is a victim of accident or to the legal heirs of such victim in the case of his death;
- To provide overriding powers to the Central Government to regulate general safety and health of persons residing in whole or part of India in the event of declaration of epidemic or pandemic or disaster;
- To make provision for Social Security Fund for the welfare of unorganised workers; and
- To make provision for adjudging the penalties imposed under the Code.

Appendix C-13: Sample Outline Spoil Management Plan

- The Spoil Management Plan should be site specific and be part of the monthly Construction Management Plan.
- The contractor, in consultation with the ULB, has to find out appropriate location/s for the disposal of the excess soil generated. The spoils should be deposited only at these sites.
- Further precautions need to be taken in case of the contaminated spoils.
- The vehicle carrying the spoil should be covered properly.
- The spoils generating from each site should be removed on the same day or immediately after the work is complete. The site / road should be restored to the original condition.

I. Spoils information

The spoil information contains the details like a) The type / material, b) Potential contamination by that type, c) Expected volume (site / component specific), d) Spoil Classification etc.

II. Spoils management

The Spoil Management section gives the details of a) Transportation of spoil b) disposal site details c) Precautions taken d) Volume of contaminated spoil, if present, d) Suggested reuse of disposal of the spoil

III. Documentation

The volume of spoil generated (site specific, date wise), site disposed, reuse / disposal details should be documented properly.

Appendix C-14: Sample Outline Traffic Management Plan

A. Principles for TMP around the Water Pipes/Sewer Construction Sites

1. One of the prime objectives of this TMP is to ensure the safety of all the road users along the work zone, and to address the following issues:

- the safety of pedestrians, bicyclists, and motorists travelling through the construction zone;
- protection of work crews from hazards associated with moving traffic;
- mitigation of the adverse impact on road capacity and delays to the road users;
- maintenance of access to adjoining properties; and
- addressing issues that may delay the project.

B. Operating Policies for TMP

2. The following principles will help promote safe and efficient movement for all road users (motorists, bicyclists, and pedestrians, including persons with disabilities) through and around work zones while reasonably protecting workers and equipment.

- Make traffic safety and temporary traffic control an integral and high-priority element of project from planning through design, construction, and maintenance.
- Inhibit traffic movement as little as possible.
- Provide clear and positive guidance to drivers, bicyclists, and pedestrians as they approach and travel through the temporary traffic control zone.
- Inspect traffic control elements routinely, both day and night, and make modifications when necessary.
- Pay increased attention to roadside safety in the vicinity of temporary traffic control zones.
- Train all persons that select, place, and maintain temporary traffic control devices.
- Keep the public well informed.
- Make appropriate accommodation for property owners, residents, businesses, emergency services, railroads, commercial vehicles, and transit operations.

3. **Figure A2 to Figure A12** illustrates the operating policy for TMP for the construction of water pipes and the sewers along various types of roads.

C. Analyze the impact due to street closure

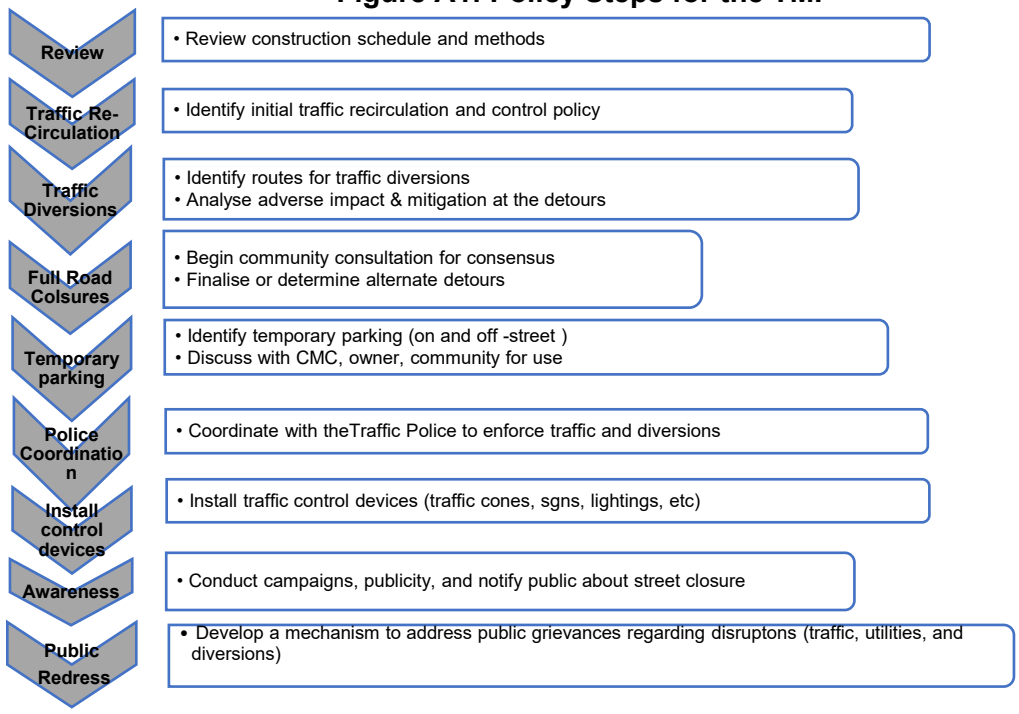
4. Apart from the capacity analysis, a final decision to close a particular street and divert the traffic should involve the following steps:

- approval from the ULB/Public Works Department (PWD) to use the local streets as detours;
- consultation with businesses, community members, traffic police, PWD, etc, regarding the mitigation measures necessary at the detours where the road is diverted during the construction;
- determining of the maximum number of days allowed for road closure, and incorporation of such provisions into the contract documents;
- determining if additional traffic control or temporary improvements are needed along the detour route;
- considering how access will be provided to the worksite;
- contacting emergency service, school officials, and transit authorities to determine if there are impacts to their operations; and
- developing a notification program to the public so that the closure is not a surprise. As part of this program, the public should be advised of alternate routes that commuters can take or will have to take as result of the traffic diversion.

5. If full road-closure of certain streets within the area is not feasible due to inadequate capacity of the detour street or public opposition, the full closure can be restricted to weekends

with the construction commencing on Saturday night and ending on Monday morning prior to the morning peak period.

Figure A1: Policy Steps for the TMP



D. Public awareness and notifications

6. As per discussions in the previous sections, there will be travel delays during the constructions, as is the case with most construction projects, albeit on a reduced scale if utilities and traffic management are properly coordinated. There are additional grounds for travel delays in the area, as most of the streets lack sufficient capacity to accommodate additional traffic from diverted traffic as a result of street closures to accommodate the works.

6. The awareness campaign and the prior notification for the public will be a continuous activity which the project will carry out to compensate for the above delays and minimize public claims as result of these problems. These activities will take place sufficiently in advance of the time when the roadblocks or traffic diversions take place at the particular streets. The reason for this is to allow sufficient time for the public and residents to understand the changes to their travel plans. The project will notify the public about the roadblocks and traffic diversion through public notices, ward level meetings and city level meeting with the elected representatives.

7. The PIU will also conduct an awareness campaign to educate the public about the following issues:

- traffic control devices in place at the work zones (signs, traffic cones, barriers, etc.);
- defensive driving behaviour along the work zones; and
- reduced speeds enforced at the work zones and traffic diversions.

8. It may be necessary to conduct the awareness programs/campaigns on road safety during construction.

9. The campaign will cater to all types of target groups i.e. children, adults, and drivers. Therefore, these campaigns will be conducted in schools and community centres. In addition, the project will publish a brochure for public information. These brochures will be widely circulated around the area and will also be available at the PIU, and the contractor's site office. The text of the brochure should be concise to be effective, with a lot of graphics. It will serve the following purpose:

- explain why the brochure was prepared, along with a brief description of the project;
- advise the public to expect the unexpected;
- educate the public about the various traffic control devices and safety measures adopted at the work zones;
- educate the public about the safe road user behaviour to emulate at the work zones;
- tell the public how to stay informed or where to inquire about road safety issues at the work zones (name, telephone, mobile number of the contact person; and
- indicate the office hours of relevant offices.

E. Install traffic control devices at the work zones and traffic diversion routes

10. The purpose of installing traffic control devices at the work zones is to delineate these areas to warn, inform, and direct the road users about a hazard ahead, and to protect them as well as the workers. As proper delineation is a key to achieve the above objective, it is important to install good traffic signs at the work zones. The following traffic control devices are used in work zones:

- Signs
- Pavement Markings
- Channelizing Devices
- Arrow Panels
- Warning Lights

11. Procedures for installing traffic control devices at any work zone vary, depending on road configuration, location of the work, construction activity, duration, traffic speed and volume, and pedestrian traffic. Work will take place along major roads, and the minor internal roads. As such, the traffic volume and road geometry vary. The main roads carry considerable traffic; internal roads in the new city areas are wide but in old city roads very narrow and carry considerable traffic. However, regardless of where the construction takes place, all the work zones should be cordoned off, and traffic shifted away at least with traffic cones, barricades, and temporary signs (temporary “STOP” and “GO”).

12**.** **Figure A2 to Figure A12** illustrates a typical set-up for installing traffic control devices at the work zone of the area, depending on the location of work on the road way, and road geometrics:

- Work on shoulder or parking lane
- Shoulder or parking lane closed on divided road
- Work in Travel lane
- Lane closure on road with low volume
- Lane closure on a two-line road with low volume (with yield sign)
- Lane closure on a two-line road with low volume (one flagger operation)
- Lane closure on a two lane road (two flagger operation)
- Lane closure on a four lane undivided Road
- Lane closure on divided roadway
- Half road closure on multi-lane roadway
- Street closure with detour

13. The work zone should take into consideration the space required for a buffer zone between the workers and the traffic (lateral and longitudinal) and the transition space required for delineation, as applicable. For the works, a 30 cm clearance between the traffic and the temporary STOP and GO signs should be provided. In addition, at least 60 cm is necessary to install the temporary traffic signs and cones.

14. Traffic police should regulate traffic away from the work zone and enforce the traffic diversion result from full street closure in certain areas during construction. Flagggers/ personnel should be equipped with reflective jackets at all times and have traffic control batons (preferably the LED type) for regulating the traffic during night time.

16. In addition to the delineation devices, all the construction workers should wear fluorescent safety vests and helmets in order to be visible to the motorists at all times. There should be provision for lighting beacons and illumination for night constructions.

Figure A2 & A3: Work on shoulder or parking lane & Shoulder or parking lane closed on divided road

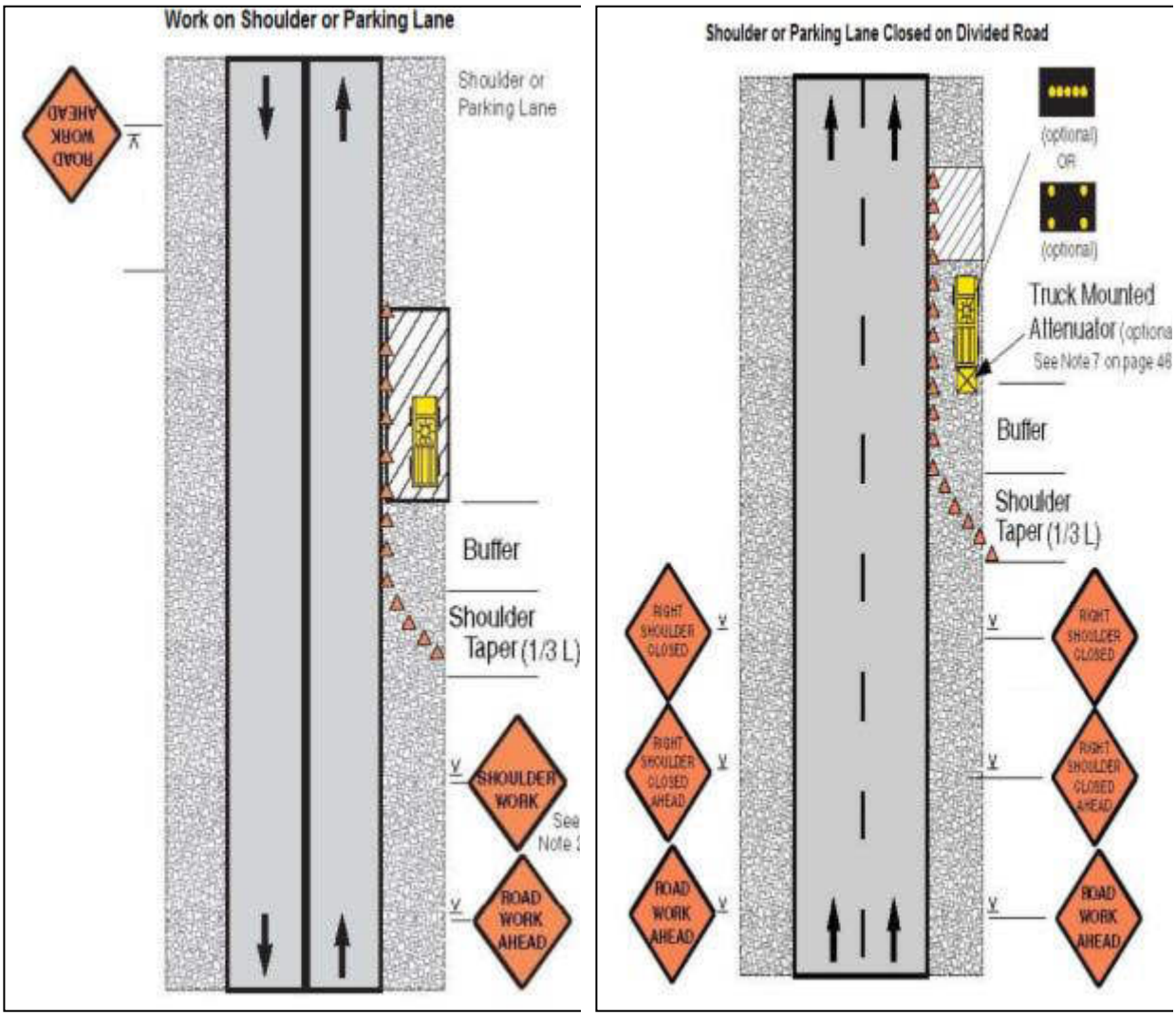


Figure A4 & A5: Work in Travel Lane & Lane closure on road with low volume

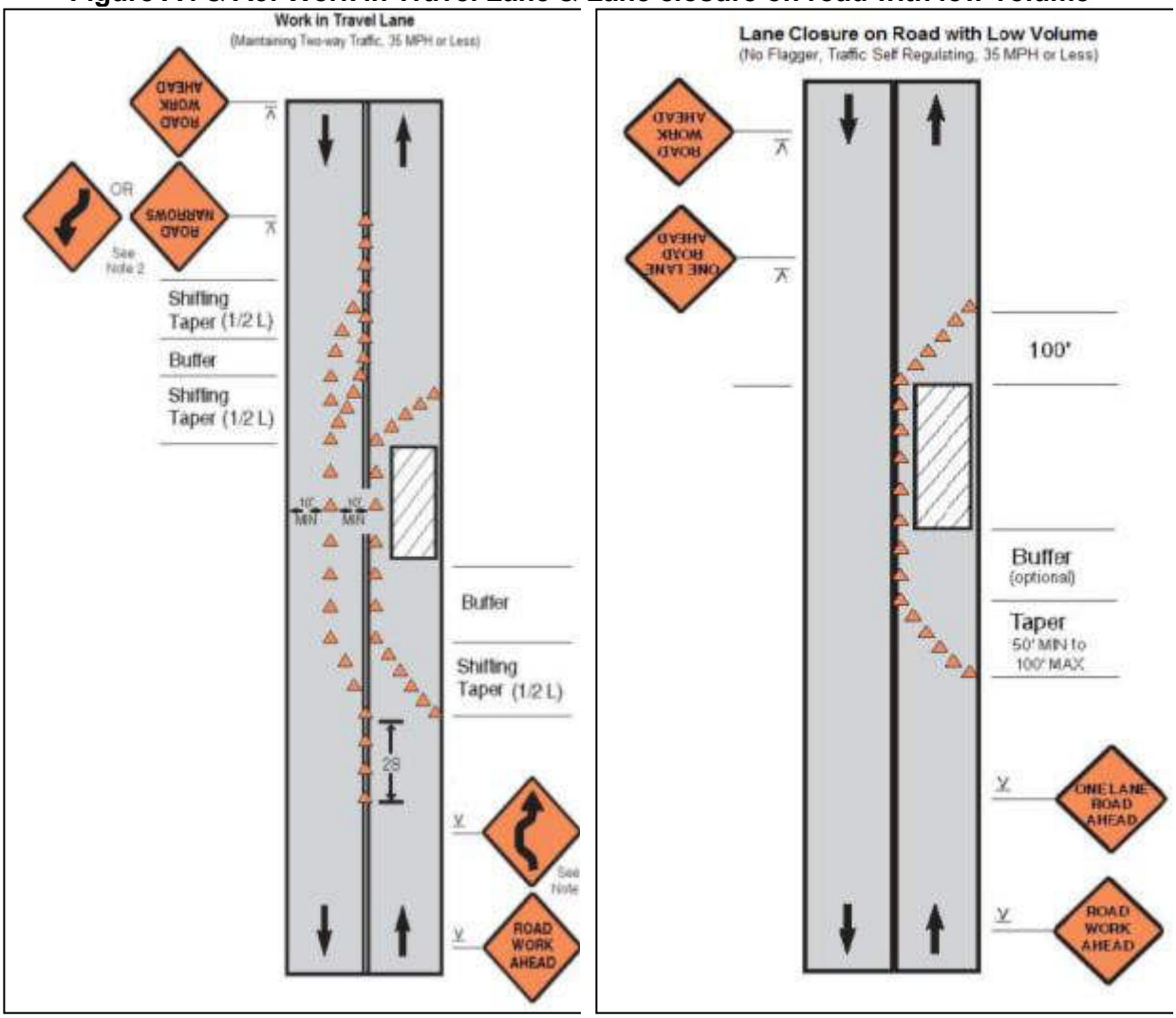
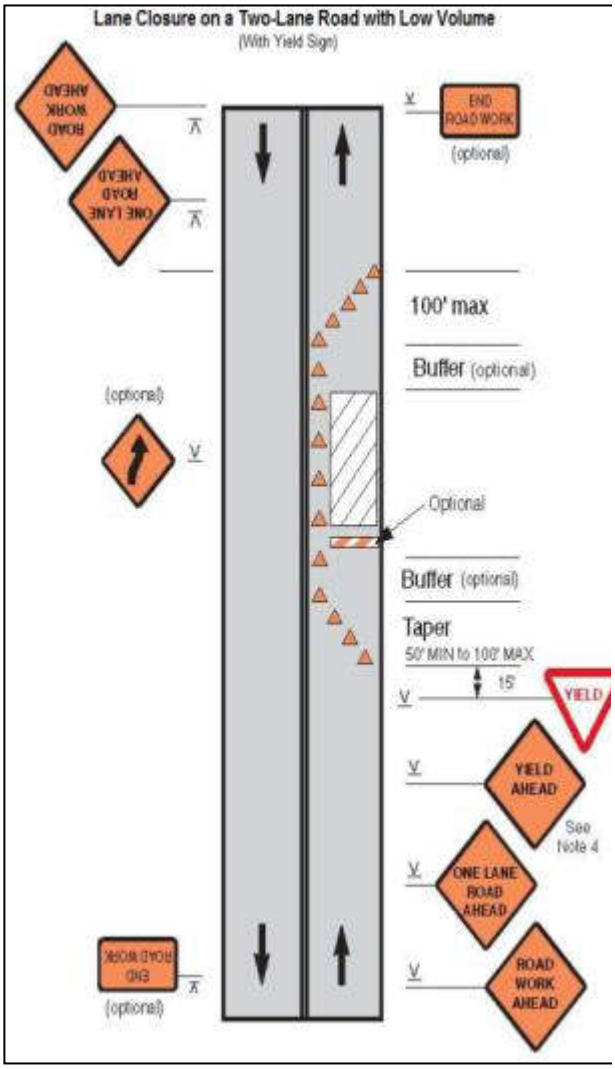


Figure A6 & A7: Lane closure on a two-line road with low volume (with yield sign) & Lane closure on a two-line road with low volume (one flagger operation)



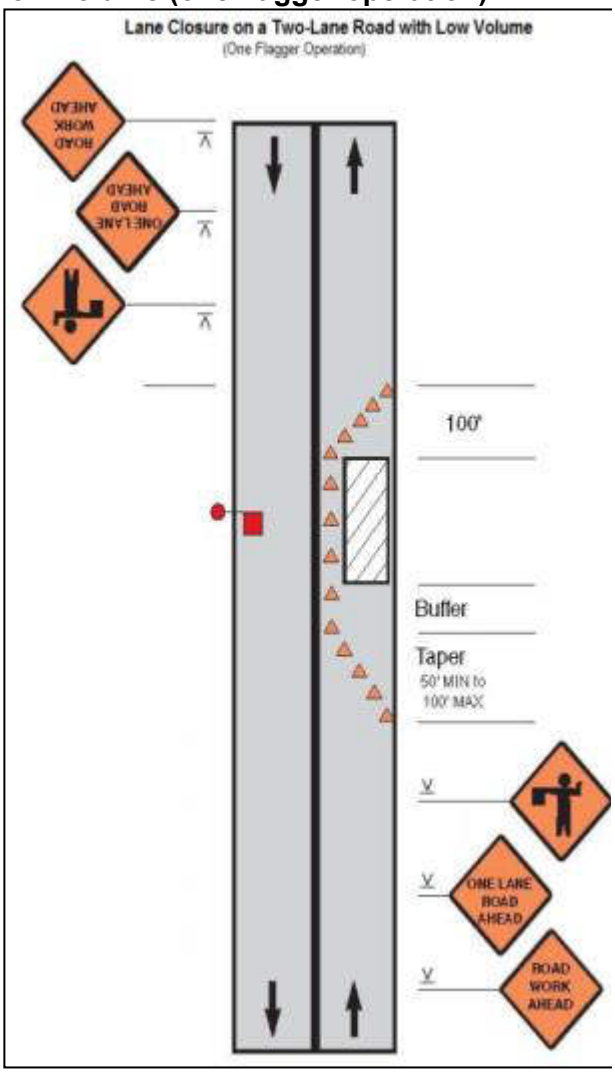


Figure A8 & A9: Lane Closure on a Two-Lane Road (Two Flagger Operation) & Lane Closure on a Four-Lane Undivided Road

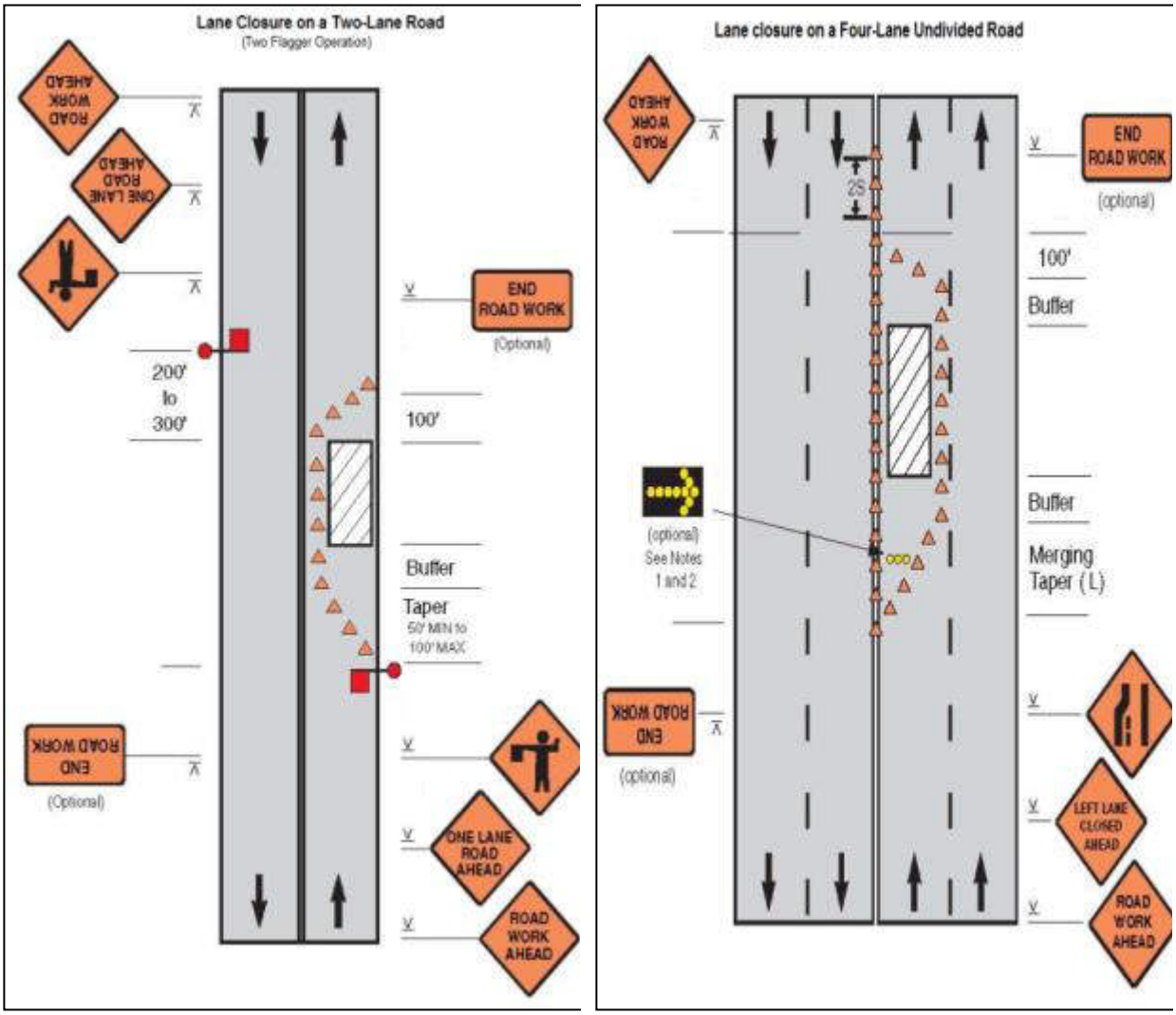
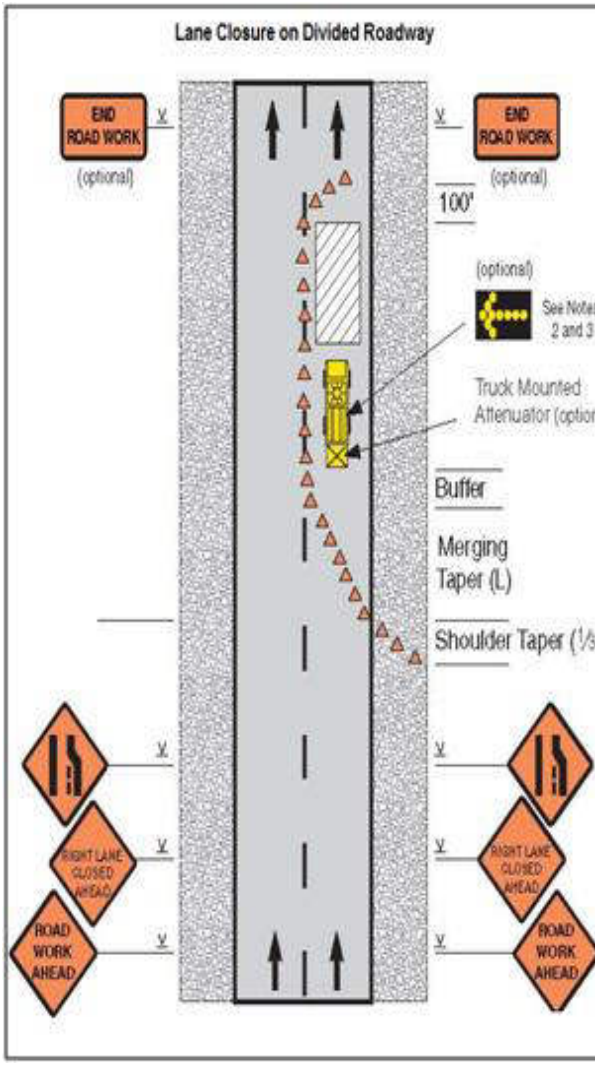


Figure A10 & A11: Lane Closure On Divided Roadway & Half Road Closure On Multi-Lane Roadway



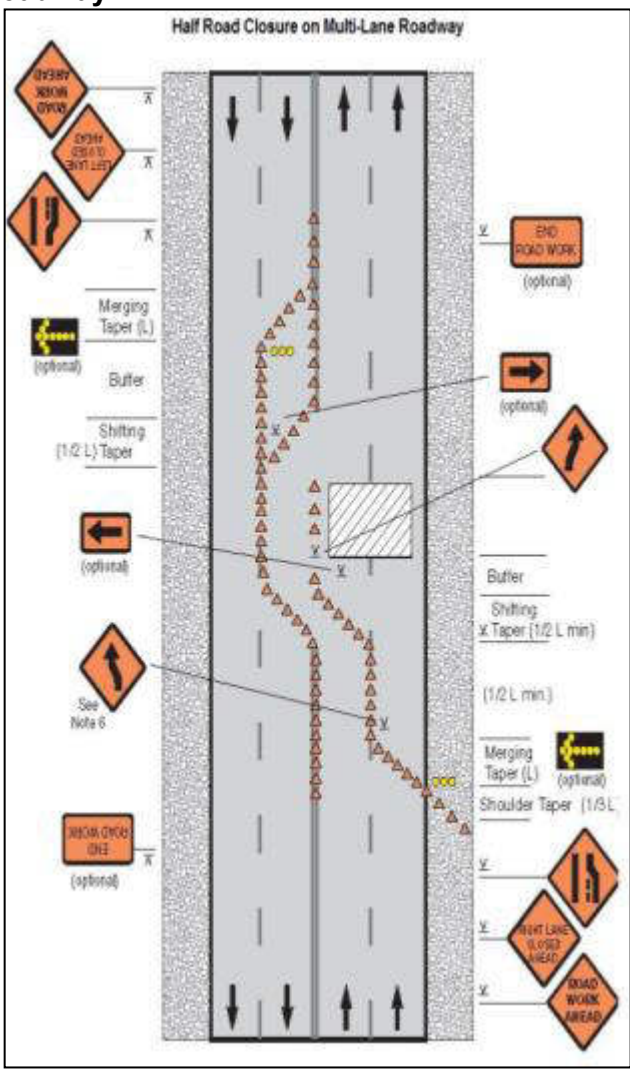
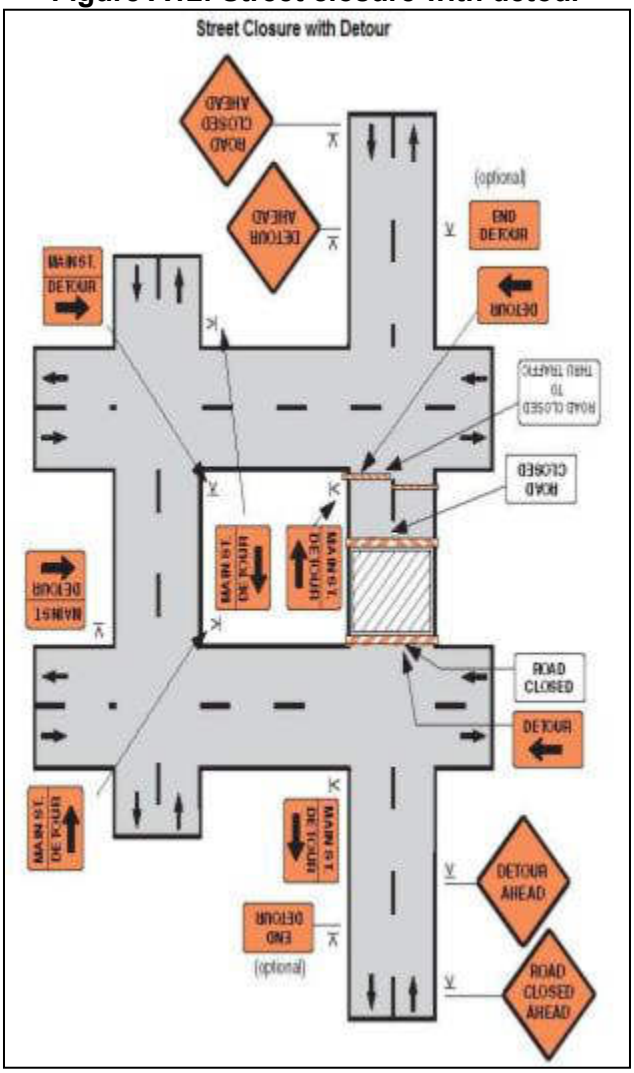


Figure A12: Street closure with detour



Appendix C-15: Sample Six Monthly Reporting Format

1. Introduction

- Overall project description and objectives
- Description of sub-projects
- Environmental category of the sub-projects
- Details of site personnel and/or consultants responsible for environmental monitoring
- Overall project and sub-project progress and status

No.	b-Project Name	Status of Sub-Project				List of Works	Progress of Works
		Design	Pre-Construction	Construction	Operational Phase		
		⊔	⊔	⊔	⊔		
		⊔	⊔	⊔	⊔		
		⊔	⊔	⊔	⊔		

2. Compliance status with National/ State/ Local statutory environmental requirements

No.	Sub-Project Name	tory Environmental Requirements	Status of Compliance	Action Required

3. Compliance status with environmental loan covenants

No.(List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required

4. Compliance status with the environmental management and monitoring plan

5. Provide the monitoring results as per the parameters outlined in the EMP. Append supporting documents where applicable, including Environmental Site Inspection Reports.

6. There should be reporting on the following items which can be incorporated in the checklist of routine Environmental Site Inspection Report followed with a summary in the semi-annual report send to ADB. Visual assessment and review of relevant site documentation during routine site inspection needs to note and record the following:

- What are the dust suppression techniques followed for site and if any dust was noted to escape the site boundaries;
- If muddy water was escaping site boundaries or muddy tracks were seen on adjacent roads;
- adequacy of type of erosion and sediment control measures installed on site, condition of erosion and sediment control measures including if these were intact following heavy rain;
- Are their designated areas for concrete works, and refuelling;
- Are their spill kits on site and if there are site procedure for handling emergencies;
- Is there any chemical stored on site and what is the storage condition?
- Is there any dewatering activities if yes, where is the water being discharged;
- How are the stockpiles being managed;
- How is solid and liquid waste being handled on site;
- Review of the complaint management system;
- Checking if there are any activities being under taken out of working hours and how that is being managed.

Summary Monitoring Table

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Status of Compliance	Responsibility of mitigation	Responsibility of monitoring	Cost and Source of Funds	Remarks
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

Overall Compliance with CEMP/ EMP

No.	Sub-Project Name	EMP/CEMP Part of Contract Documents(Y/N)	CEMP/EMP Being Implemented (Y/N)	Status of Implementation (Excellent/Satisfactory/Partially Satisfactory/Below Satisfactory)	Action Proposed and Additional Measures Required

5. Approach and methodology for environmental monitoring of the project

- Brief description on the approach and methodology used for environmental monitoring of each sub-project

6. Monitoring of environmental impacts on project surroundings (ambient air, water quality and noise levels)

- Brief discussion on the basis for monitoring
- Indicate type and location of environmental parameters to be monitored
- Indicate the method of monitoring and equipment to be used
- Provide monitoring results and an analysis of results in relation to baseline data and statutory requirements

As a minimum the results should be presented as per the tables below.

Air Quality Results

Site No.	Date of Testing	Site Location	eters (Government Standards)			
			PM_{10} µg/m3	$PM_{2.5}$ µg/m3	SO2 µg/m3	NO2 µg/m3

Water Quality Results

Site No.	Date of Sampling	Site Location	Parameters(Government Standards)					
			pH	Conductivity µS/cm	BODmg/L	TSSmg/L	TNmg/L	TPmg/L

Noise Quality Results

Site No.	Date of Testing	Site Location	LAeq (dBA) (Government Standard)	
			DayTime	NightTime

7. Summary of key issues and remedial actions

- Summary of follow up time-bound actions to be taken within a set timeframe.

8. Appendixes

- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection report
- Other

Appendix C-16: Sample Environmental Site Inspection Report

Project Name Contract Number

NAME: DATE: TITLE: DMA: LOCATION: GROUP:

WEATHER:	**Project Activity Stage**	**Survey**	
		Design	
		Implementation	
		Pre-Commissioning	
		Guarantee Period	

	Compliance
Compliance marked as Yes / No / Not applicable(NA) / Partially Implemented (PI)	
EHS supervisor appointed by contractor and available on site	
Construction site management plan (spoils, safety, schedule, equipment etc.,) prepared	
Traffic management plan prepared	
Dust is under control	
Excavated soil properly placed within minimum space	
Construction area is confined; no traffic/pedestrian entry observed	
Surplus soil/debris/waste is disposed without delay	
Construction material (sand/gravel/aggregate) brought to site as & when required only	
Tarpaulins used to cover sand & other loose material when transported by vehicles	
After unloading , wheels & undercarriage of vehicles cleaned prior to leaving the site	
No chance finds encountered during excavation	
Work is planned in consultation with traffic police	
Work is not being conducted during heavy traffic	
Work at a stretch is completed within a day (excavation, pipe laying & backfilling)	
Pipe trenches are not kept open unduly	
Road is not completely closed; work is conducted on edge; at least one line is kept open	
Road is closed; alternative route provided & public informed, information board provided	
Pedestrian access to houses is not blocked due to pipe laying	
Spaces left in between trenches for access	
Wooden planks/metal sheets provided across trench for pedestrian	
No public/unauthorized entry observed in work site	
Children safety measures(barricades, security)in place at works in residential areas	
Prior public information provided about the work, schedule and disturbances	
Caution/warning board provided on site	
Guards with red flag provided during work at busy roads	
Workers using appropriate PPE (boots, gloves, helmets, ear muffs etc)	
Workers conducting or near heavy noise work is provided with ear muffs	
Contractor is following standard & safe construction practices	
Deep excavation is conducted with land slip/protection measures	
First aid facilities are available on site and workers informed	
Drinking water provided at the site	
Toilet facility provided at the site	
Separate toilet facility is provided for women workers	
Workers camps are maintained cleanly	
Adequate toilet & bath facilities provided	
Contractor employed local workers as far as possible	

Workers camp set up with the permission of PIU	
Adequate housing provided	
Sufficient water provided for drinking/washing/bath	
No noisy work is conducted in the nights	
Local people informed of noisy work	
No blasting activity conducted	
Pneumatic drills or other equipment creating vibration is not used near old/risky buildings	

Signature

_____

_____ _____

Name
Position

Name
Position

Appendix C-17: Sample Grievance Registration Form

(To be available in Hindi and English)

The _____Project welcomes complaints, suggestions, queries, and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.

Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing *(CONFIDENTIAL)* above your name. Thank you.

Date	Place of registration	Project Town Project:			
Contact information/personal details					
Name		Gender	* Male * Female	Age	
Home address					
Place					
Phone no.					
E-mail					
Complaint/suggestion/comment/question Please provide the details (who, what, where, and how) of your grievance below: If included as attachment/note/letter, please tick here:					
How do you want us to reach you for feedback or update on your comment/grievance?					

FOR OFFICIAL USE ONLY

Registered by: (Name of official registering grievance)	
Mode of communication: Note/letter E-mail Verbal/telephonic	
Reviewed by: (Names/positions of officials reviewing grievance)	
Action taken:	
Whether action taken disclosed:	Yes No
Means of disclosure:	

Appendix C-18: Management Plan for Night works at Project Sites

Following requirements should be fulfilled for construction works at night hours-

1. Night works should be avoided at construction sites specially in residential areas and should be performed only when day works are not possible due to excessive traffic/public/pedestrian movement, site of cultural or religious importance, where there is huge crowd during day hours or any other unavoidable circumstances.
2. Contractor should plan for night works only after directions from PMU/PIU/CMSC
3. Contractor should submit plan for night works for approval from PIU.
4. PIU should ensure that prior written information should be given to local authorities such as district administration, Police/traffic police, line agencies concerned, residents welfare association/business association/vyapar of the affected areas and their consents/permissions should be taken prior to start of night works.
5. PIU/CMSC engineers should check and ensure that all the preparation as per management plan is done by contractor and contractor is having all the necessary equipments and materials for night works.
6. Contractor is required to have following equipments/arrangements for night works-
    - Contractors should have hand held noise level meter for measurement of noise during night hours
    - Contractors should have hand held lux meter for the measurement of illumination during night hours
    - Preferably electrical connections is available for running equipments otherwise sound proof/super silent Diesel Generator set should be available
    - Sound level should not increase as per following-

Type of area of work	**Maximum noise level dB(A)**
Industrial	70
Commercial	55
Residential	45
Silence zone	40

    - Illumination should be as follows-

Minimum illumination (lx)	**Areas to be illuminated**	**Type of work activity**
54	Illumination throughout the work area	General work area lighting, and performance of visual tasks of large size, or medium contrast, or low require accuracy
108	Illumination of work area and areas adjacent to equipment	Performance of visual tasks of medium size, or low to medium contrast, or medium required accuracy
216	Illumination of task	Performance of visual tasks of small size, or low contrast or high required accuracy or fine finish

    - As far as possible ready mix concrete from batching plant to be used, otherwise the concrete should be prepared away from residential areas and brought to the site
    - All the noise activity like hammering, cutting, crushing, running of heavy equipments should be done in day time and avoided in night time

- Workers engaged in night works should have adequate rest/sleep in day time before start of night works
- Worker engaged for night works should have previous experience of night works and should be physically fit for such works including clear vision in night
- All the necessary provisions of traffic aids such as traffic signals, road signage, barricades, cautions boards, traffic diversion boards etc. should be available with fluorescent/retro-reflective arrangements
- Workers should be trained before start of night works about risks and hazards of night works and their mitigation measures and should be provided all the protective aids (PPEs) including fluorescent/retro-reflective vests
- Horns should not be permitted by equipment's and vehicles
- Workers should not shout and create noise
- First aid and emergency vehicles should be available at site
- Emergency preparedness plan should be operative during night works
- Old persons and pregnant women and women having small kids should not work in night time
- All the vehicles and equipment's being used at night works should have adequate type of silencers/enclosures/mufflers to reduce noise
- All the vehicles should be checked for working head lamps, tail lamps, inner lights etc. before start of night works

7. PIU/CMSC site engineers and contractor's safety personnel should closely monitor the safety of works continuously and noise and illumination levels on hourly basis and maintain photographic and videographic records as well as register the observations
8. Night works should be stopped early in the morning at least one hour before start of pedestrian/traffic movement
9. After completion of night works all the site should be cleaned and maintained obstruction free for day time movement of vehicles and pedestrians
10. Drivers and workers should be alert and responsive during night works
11. All the wages to workers working in night hours should be as per the applicable labour acts
12. Avoid any nuisance which may create problems to nearby habitants and work peacefully during night hours
13. Night works should not be conducted near hospitals and during peak seasons such as peak tourist season, students' exam times etc.

Appendix C-19: Guidelines for Safety during Monsoon/Heavy rainfall

Excavation and refilling of earth are common activities, which, if not carefully executed may pose problems to the safety of works as well as passers-by and road users during the impending Monsoon.

Normal and heavy rainfall event affect our ongoing works, It should be our conscientious effort to ensure that such events do not prove to be problematic to people and structures in town. During monsoon PIU/PMCBC should ensure that any further excavation work is taken up only after ensuring that the earlier work is in safe stage. It is desired that DCM/ACM & Ex En PIU should inspect all sites during rains and take proactive actions.

Some of the precautions and mitigation measures to be taken are discussed below-

1. The execution of works having deep excavation in smaller lanes and congested areas should be completed well before monsoon. The works of deep excavation during monsoon should not be preferably taken up or extensive care should be taken for execution of such works.
2. The settlement in refilled trenches of sewerage and water supply lines may occur during monsoon. PMCBC and PIU team should inspect all sites after a storm to identify such reaches and take immediate corrective action by proper refilling and compacting.It is responsibility of all engineers to look after this activity during monsoon and ensure corrective actions from Contractor's side.
3. The contractor's crew should be equipped with vehicle, gum boots, raincoats, torch etc. to tackle such situation during and after rains. Adequate quantities of earth, debris and gravel should be stacked at strategic places so that no time is lost in procuring such material.
4. In trenches where pipe laying has been done and duly tested and approved, refilling should be done and all surplus material relocated to safe disposal sites such that it does not obstruct traffic or waterways.
5. All open ends of WS and WW pipelines should be firmly plugged to prevent debris from entering the pipeline. Manhole covers of sewer lines should be fixed in place to avoid any harm to road users.
6. Drains are primary or secondary carriers of storm water. Any unutilized construction material should be relocated to allow free passage of storm water. Surplus earth should be suitably and immediately be relocated to avoid earth from falling into the drain so that choking does not occur.
7. Overhead works should not be carried on in-weather conditions that threaten the safety of workers. More frequent checks on scaffold and bracings should be done during monsoon season.
8. Additional precautions should be taken of the power lines, ignorance and carelessness can cause major accidents and casualty.
9. Take preventive measures for water logging in working areas by providing dewatering pumps. Place bright and reflective warning signs.
10. Inspection should also be carried out before resumption of work after a shower/rain.
11. Storage of Construction Material: Steel & Cement are vital ingredients for quality construction work but in absence of proper storage, especially during monsoon, cement and steel may rapidly decline in quality and strength. Care should be taken to protect these materials and use of any exposed material should be allowed only after conducting fresh tests. Improper storage of such material should be reported to SE PIU/ACM PMCBC and use of any apparently affected material should be done after permission of SE PIU/DCM/ACM.

Additional Precautions

1. Adequate set up and resources such as dewatering pumps, electrical routings etc should be planned ahead. Water logging on main roads to be avoided, where construction works are going on.
2. Ensuring the monsoon specific PPE's issued in adequate and are used during monsoon.
3. Use of electric extension box should be avoided; extension cables (if used) should not be wet and damaged. Cables connections should be only weatherproof/waterproof. Electrical and HSE personnel of contractor should visit permanent and running sites regularly. Transparent protective sheets/rain sheds should be placed for the power distribution boards.
4. Welding machines, bar cutting machines etc. should be kept in dry conditions; should not stand in water logged area. Brakers and Drill machines should not be used when raining; dirt/mud should be scrubbed with cloth.
5. Special Trainings to all drivers and operators on safe practices and all vehicles/ equipment's maintenance checks to be more frequent.
6. High boom equipment to be stopped during blowing of high speed wind and rain storm. Arresting of parked vehicles, equipment during monsoon should be done.
7. All chemicals should be stored as per MSDS, chemicals to be protected from water ingress. Chemical waste should be disposed for preventing overflow of chemicals.
8. At labor camps following precautions should be taken:-
    - Maintaining hygiene & proper housekeeping.
    - Additional health checkup camp to identify seasonal diseases
    - Preventive measures on mosquito/parasite breeding mainly in work locations and camps
    - Frequent cleaning of toilets
    - To avoid water borne diseases, high level of cleanliness to be maintained, drinking water containers need to be cleaned and kept covered. Walk areas and pathways to be covered with Murom and soft rock particles (to avoid soft soil conditions).
    - Obstacle free approach to rest sheds, camp and toilets.
    - Proper illumination, provision of battery operated emergency lights
    - No bonfires inside resting sheds. No use of wood.

Note-

SE–PIU and ACM-PMCBC should oversee the arrangements to effectively deal with the eventuality.

EHS officer of contractor should visit each site and camps more frequently. Contractor/EHS officer will also impart training on safe working methods during Monsoon and will keep a daily watch on weather conditions to share with site team to act accordingly.

Contractor should organize Monsoon Health Camps and Monitor Workmen Habitat and Hygiene.

Appendix C-20: Sample ACM Management Plan

BACKGROUND OF ASBESTOS

1. The purpose of this Asbestos Management Plan (AMP) is to identify, use appropriate methodology and scientifically handling /disposal of the Asbestos Containing Materials (ACM) in order to comply with the applicable National legislation and International standards in sync with norms of ADB's SPS 2009. ADB has mandated as per Appendix 5 - prohibit the investment activities list - production of, trade in, or use of un-bonded asbestos fibers is deliberated. As per SPS 2009 Safeguard Requirement 1, it is emphasized "that the borrower/client will provide workers with a safe and healthy working environment" in the work areas with accounted risks inherent to the work zone and defined safety instructions and standard operating procedures identifying roles and responsibilities.

2. Asbestos is a collective name given to a group of minerals that occur naturally as fiber bundles and possess high tensile strength, flexibility, heat resistance, non-biodegradability with chemical and physical durability. Asbestos is hydrated silicates with complex crystal structures. It is found in two configurations: chrysotile (derived from serpentine minerals) and amphibole is a naturally occurring mineral with long thin fibers. The most abundant asbestos used in the world is chrysotile. The use of ACM propagated due to its economic viability.

3. The purpose of this AMP is to identify, use appropriate methodology and scientifically handling /disposal of the Asbestos Containing Materials (ACM) in order to comply with the applicable National legislation and International standards in sync with norms of ADB's SPS 2009.. As per SPS 2009 Safeguard Requirement 1, it is emphasized "that the borrower/client will provide workers with a safe and healthy working environment" in the work areas with accounted risks inherent to the sector and defined safety instructions and standard operating procedures identifying roles and responsibilities.

Table 1: REGULATORY FRAMEWORK, STANDARDS AND PROTOCOL

Government of India Laws, Regulations and standards on Asbestos Applicable to the projects	**Requirements for the project**
IS 11768: 1986/2005: Recommendations for disposal of asbestos waste material	The standard emphasis that every employer who undertakes work which is liable to generates asbestos containing waste, shall undertake adequate steps to prevent and /orreduce the generation of airborne dust during handling, storing, transportation and final disposal of final disposal of asbestos and asbestos containing products. • The crux is waste avoidance: the practice inculcated should focus the on minimal waste generation. • Waste Collection: In the project circumstance, the waste is referred to the damaged powered asbestos which will be collected in the Permissible plastic bags to be disposed off to the nearest TSDF facilities.
IS 12081: Pictorial Warning to be implemented on equipment containing Asbestos Contaminated Products.	The objective of the caution is to make the person handling to take all pre-cautionary measures and make them aware of all the possible risk.

	
IS 11451: Safety and Health Requirements related to Occupational Exposure to Asbestos contaminated Products.	In the project the norms pertaining to limiting number of hours working with ACM will be 8.0 hrs/48 hrs a week and the medical examination has to be periodic, the environmental monitoring has to be done as per the protocol. The safety at work place shall be enforced.
IS 11768: Waste Disposal Procedure for Asbestos Containing Products.	The protocol pertaining to disposal of the waste is emphasized, the collection of ACM powered will be in permissible plastic bags, which will be twisted tight at the neck so that the wear and tear due to abrasion will be minimum and the transportation of the asbestos waste has to be done by the authorized vendor to the approved landfill site that in the project case id TSDF.
Sampling of asbestos fiber (as per BIS-11450) has to be done regularly using personal sampler and determined using phase contrast microscope.	The Sampling and analysis protocol is emphasized. Details are given as above.

4. Further, there are several legislations that regulate the use and handling of asbestos as applicable, namely:

a. The Supreme Court of India – Banned ACM use in January 21 2011.
b. National Green Tribunal - In pursuant to the above order, in 2015, NGT issued an order- “that there is no asbestos mining presently operational anywhere in the country and the operations of the mines of associated minerals with asbestos has also been halted.”
c. Environmental (Protection) Act (1986)-Environmental monitoring.

RISK ASSESMENT:

5. The process of evaluation of risk at all the working sites was evaluated with the

inventorization of the unscientific storage pipes-in case of worst scenario. The site identified and evaluated was Sardarshar. Site visit was conducted to evaluate the risk associated with the ACM handling and re- handling. Working with or handling AC pipes in manner that produces dust, fibers, air borne particles etc., is very harmful and hazardous to the workers and general public in and around the work sites. The condition of existing underground AC pipes are not known, however, as these are old certain pipes will be in deteriorated conditions. So the Conditions were presumed if it is in friable form or in a condition in which it can release fibers before it is subjected any disturbance or removal, all safeguard measures needs to be adopted. There were certain areas where the AC pipes were subjected to shear and are powered, and AC Pipe ends were damaged these were the high risk zones in the campus. The probability of the air borne asbestos fibers in the areas cannot be over ruled.

6. Thus it is necessitated to draft standard operating procedure for disposal of ACM. The purpose of this standard operating procedure (SOP) is to ensure the safe handling of AMC including protection from hazards associated with uncontrolled distribution, encounter and removal of Asbestos Cement (AC) Pipes and pipe fittings. The scope of this SOP encompasses all aspects of safe AC pipe handling including identification of site, re-handling and encountering of ACM, site selection and proper identification for storage, inventorization, monitoring, final disposal, training and maintenance of records.

7. The fatal health hazard with inhalation of air borne asbestos fibers and its adverse health impact are known and needs a proper attention and planning with defined roles and responsibilities to ensure the work zone is at minimal risk and safe for the workers. It is also necessary to mandate the standard operating procedures with implementation of all requisite safety gears.

8. The assessment of the ACM disposal will be vested with the DBO Operator. The undamaged pipe-where the pipe ends are intact that there is no damaged on the entire length of pipe-to be stored in isolated storage with secured pipe ends either by wrapping the ends with permissible plastic bags. The damaged/broken pipes/powered pipes will be disposed off, by bagging the same in permissible plastic bags. All the records pertaining to the inventorization has to be kept by the DBO Contractor. The same shall be cross verified by RUIDP.

EMERGENCY RESPONSE PLAN & CHANCE FIND PROTOCOL

9. The emergency procedures should include managing an uncontrolled release of asbestos materials into the workplace. The onus of the same shall be ensured with immediate action of the field staff-DBO Operator/ HSE Staff. Steps should be taken to:

- Warn anybody who may be affected.
- Exclude from the area anyone not needed to deal with the release.
- Identify the cause of the uncontrolled release.
- Regain adequate control as soon as possible.
- Make sure anyone in the work area affected, who is not wearing personal protective equipments (PPEs), including respiratory protective equipment (RPE), leaves the affected area immediately.
- Minimize the spread of asbestos by ensuring they are suitably decontaminated.
- Clean up dust and debris.
- Decontaminate anyone who is contaminated with dust and debris.
- Ensure rags, clothing or PPE is decontaminated or disposed of as contaminated

waste.

- Consider alone and/or remote workers to ensure they can alert someone if necessary.

Check what you're working on before you start:

- Avoid using a sweeping brush as this can spread asbestos.
- Make sure no unauthorised personnel enter the area.
- The clean-up of any accidental release of higher risk materials, eg asbestos cuttings, powered asbestos that may release the asbestos fibers, to be done by authorized person

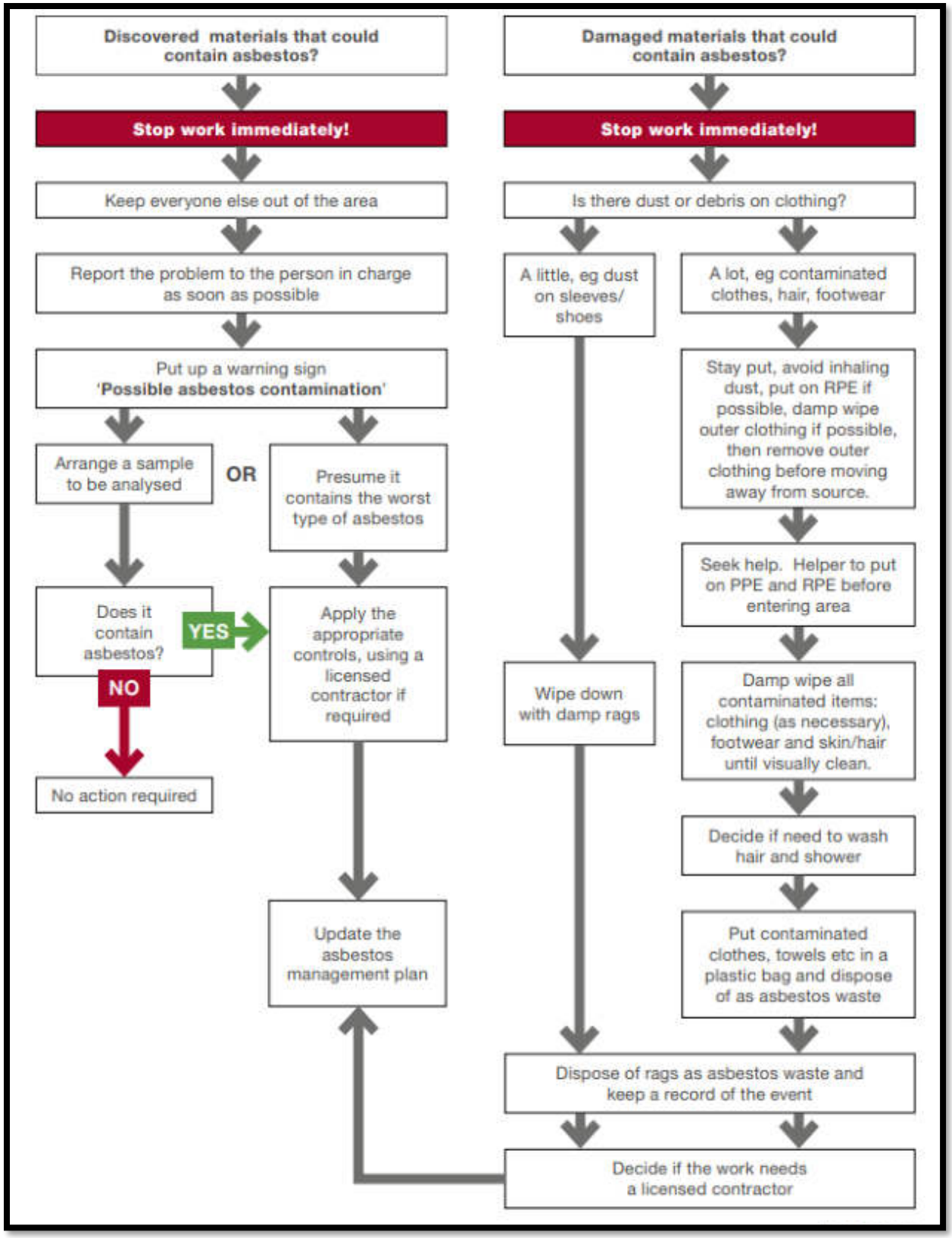


Fig.No.1-Showing Flow chart of ERP

Table 2-Roles and Responsibilities

PRE-CONSTRUCTION				
Activities	**Responsibilities**	**Associated Documents**	**Estimated Cost**	**Remark**
Design to encounter minimal ACM, and then Identification & Inventorization ACM - AC pipes & fittings	**RUIDP & DBO CONTRACTOR**	Form-I	Rs.100/km	The onus of the minimal encounter of ACM is vested upon the RUIDP and inventory will be with the DBO Operator and has to be annually verified by RUIDP.
Define & confine ACM storage area-in-situ			Rs.65/Sq.m	The storage area made available will be confined and fenced.
Warning signage near the ACM work site, storage and on AC pipes in local language**			Rs.500/label	The signage labels can be printed, sticker pamphlets or painted.
Training of personals handling the AC pipes and fittings	**DBO CONTRACTOR**	Form-II	Rs.1000/Person	All requisite safety gears should be made available at all sites.
Use of safety Gears			Rs.6000/Person	All the safety gears should be silicon based and suitable for Asbestos protection.
Briefing of Emergency Response Plan			Rs.500/Person	All the risk zones with respect to white card has to be briefed.
Confined storage with access control plan			Rs.5000/site	Inward and outward movement of authorized person must be allowed and has to be guarded or should be under key control.
Pre-history medical records of the ACM handling team			Rs.3000/Person	All requisite medical test, Respiratory test, lungs /Chest X-ray/CT Scan, Blood Test, Lower Abdomen examination etc
CONSTRUCTION PHASE				
Monthly Inspection & Annual Environmental Monitoring.	**DBO CONTRACTOR**	Form-III	Rs.40,000/sample	The sampling zone should be 500 m from the storage site and personal sampling has to be as per SOP-2
Reporting in SEMR	**RUIDP/ DBO CONTRACTOR**	None	Nil	As per ADB Format
Collection of Health records in compliance to the local laws	**DBO CONTRACTOR/RUIDP/PHED/LSG**	Form-IV	Nil	For regular evaluation & identification of any aboronmality.

Ensure adoption of all standard operating procedure		SOP-1&2	Nil	As revision desired on basis of Site specific information may be upgraded in the SOP 1&2 if required
Collection, Segregation, Reception and Disposal as per National norms of ACM		Form-V	Nil	Standard Regulatory format has to be filled and disposed off within 90 days.
Use of safety gears prior to handling of ACM based on White Card.		White Card-Page-11	Nil	Periodic training can be site specific
Disposal of ACM to the identified TSDF Facility to be done as per procedure within or prior to 90 days		SOP-2	1500/ton of waste plus freight as per actual.	Within 90 days from the generation of waste, in case of existing waste it has to be disposed off within 90 days from the Project Start.
To inform and fill the returns in the prescribed manifest as per HWMR.		Form-V(Form-10 of the Rule HWMR	Nil	90 days from the start of work
To facilitated a restricted confined storage space with access control with proper inventorization.		Form-II	Nil	Site Specific
In-situ storage of ACM.	**DBO CONTRACTOR**	Form-VI		The storage of existing and encountered ACM pipes (more than 4.0 ft) will be stacked end to end at 90 deg. With vertical stacks, 8 inches above the ground, covered with permissible plastic sheet. The campus custodian-viz PHED etc should also be informed about the In-situ storage of ACM and its impact.
ACM removal	**DBO CONTRACTOR**	--	--	Follow ACM Removal
Record maintenance of ACM in-situ and disposed off to TSDF	**DBO CONTRACTOR**	Form-I & Form-IV	Nil	The copies of inventory generated and collected will have to be shared with Land Custodian (LC), RUIDP and DBO Operator. To distinguish the forms they can be

				numbered. FORM-I(LC),Form-IV(LC)
Transits ACM storage of waste to be disposed off to TSDF	**DBO Contractor**	Form-IV	50,000/room	An isolated storage room should be constructed with 10x10 with height of 3.5 ft roofed properly for transit disposal of ACM to TSDF. **DISPOSABLE ASBESTOS WASTE STORAGE ROOM HAZARDOUR WASTE CATEGORY-15.2** (as per Hazardous waste management & Handling Rules 2015).
POST CONSTRUCTION PHASE				
Compliance of AAQM, Asbestos Fiber monitoring and Soil Quality monitoring and Periodic Work zone monitoring(Asbestos fiber count) records to be maintained	DBO Contractor	SOP-2	Rs.40,000/sample	The Asbestos Fiber count monitoring has to be conducted prior to ACM handling operation and after ACM Handling operation by an Accredited Laboratory. List of accredited laboratory will be available at Rajasthan State Pollution Control Board website-rspcb.nic.in
Health records &Periodic Medical Checkup of the personals handling ACM to be maintained.	PHED/LSG/DBO CONTRACTOR	Form-II	Rs.3000/Person	All the concerned employees deputed to handle or deal with ACM has to have Pre medical history and periodic medical examination done

Permissible Levels

10. Permissible Exposure Limit (PEL) for asbestos is 0.1 fibers per cubic centimeter of air as an eight hour time weighted average (TWA), with an excursion limit (EL) of 1.0 asbestos fiber per cubic centimeter over a 30 minutes period.

ACM REMOVAL

11. ACM Removal has to be checked in sync with the design and emphasis has to be laid to avoid the removal of ACM, in case it is unavoidable, then all the requisite safety gears are to be adopted:

- Inform the Asbestos Expert/HSE Expert prior to removal.

- Isolate the area with access to only trained staff/employees under supervision of Asbestos /HSE Expert.
- Exhibit all warnings

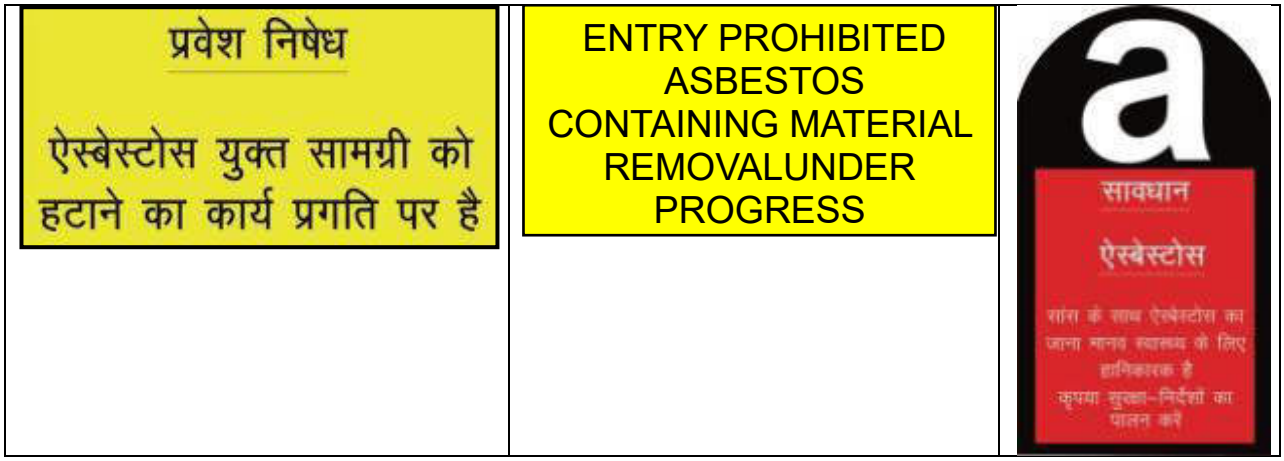


Fig. 2 Asbestos warning signage

- Undertaken Asbestos fibre Monitoring
- The trained Employees have to be deputed for removal of ACM.
- The removal ACM material has to be check with the status and extent of damage.
- Efforts should be made to remove the ACM as minimal as possible.
- The ACM removal has to be manual; it should neither be cut nor drilled.
- All removal operation should be undertaken with ACM in wet condition.
- The removed ACM will then be labeled and placed on permissible plastic sheet. It should not be put on ground directly.
- The dimension of plastic sheet should be larger than the ACM placed.
- If the ACM pipe is not damaged as about 4.0 ft and above, the ACM will be subjected for in-situ disposal.
- If the ACM is damaged and broken then it has to be packed in permissible plastic bags and disposed off to TSDF.
- Prior to disposal it can be stored in isolated room-showing board of –Hazardous waste storage room.
- The hazardous waste to be disposed off to TSDF should not be stored over 90 days after the removal date of ACM at site.
- All the safety procedures and safety gears should be worn by all the employees engaged in the ACM Removal operation.
- The Asbestos fiber monitoring, soil monitoring has to be undertaken during the operation as well.
- The process of removal of ACM will be completed after the removed ACM and its suitably disposed off either in -situ or to the isolated room prior to disposal at TSDF.
- Post ACM Removal asbestos fiber monitoring has to be undertaken to ensure the work zone is safe to resume further operations.

Safe Practices in Handling ACM

12. Proper handling and PPE:
    a. Cover up and wear PPE (Personal Protection Equipment). including respirator or

dust mask

b. Make sure the mask has two straps to hold it firmly in place. Don't use masks that only have one
c. Also wear a Hard hat, gloves, disposable coveralls with a hood, and safety glasses or goggles to protect eyes
d. Do not eat, drink or smoke in the work area as you may inhale or eat dust. Wash your hands and face with soap and water before meal breaks and when finished work for the day.
e. Do not use power tools Asbestos fibers can be released if power tools are used for anything other than the removal of screws.
f. Do not water blast or scrub with a stiff broom or brush. It is illegal to water blast asbestos cement sheets. If the material has been accidentally water blasted or has suddenly deteriorated in some way, you should call a licensed asbestos removal DBO Operator
g. Wet gently with water when removing asbestos cement pipes, use a pump spray to lightly dampen the pipes and keep the dust down. Remember: Not to waterblast asbestos cement materials.
h. Avoid drilling and cutting into asbestos products.
i. Do not drill holes through and never cut Instead remove the entire product and replace it with a non-asbestos product
j. Don't drop fiber pipes remove them carefully, Lower them to the ground, don't drop them, to minimize breakage.
k. Lay plastic sheeting under the work area to prevent any dust contaminating the ground. Use 200 micron thick plastic sheeting or bags or as permissible these must not be made from recycled materials or re-used for any other purpose.
l. The work area has to be barricaded and there should be no un-authorized person allowed. Only Trained ACM expert should be allowed to handle the ACM along with EHS Expert.
m. Close windows and doors and seal vents to stop dust getting into the house; ask neighbors' to do the same.
n. Seal off other places where dust can get in.
o. Remove soft furnishings like rugs, clothes, jute bags from the work area, and seal anything with plastics if it cannot be moved.
p. All the AC broken pipes have to collected and stacked properly with 200micron plastic wrapping with winning signage.
q. Do not leave plastic sheet lying about where they may be further broken or crushed by people or traffic.
r. Remove all ACM by the trained handler.
s. Since we are amidst of dry climatic conditions due care must be taken to see that no waste broken pipes or fittings are left loose and outside the confined area and may be dampened as required.
t. Mark and add signage.

13. Due care has to be taken to collect the dampened waste in a permissible standard bags with proper warning signage's.

14. The wastages packed have to be disposed off to Treatment, Storage or Disposal Facility (TSDF).The plastic bags must have legible note:

a. Waste Type:
b. Date of packing:
c. Qty/Numbers:

d. Packed by:
e. Warning Signage:
f. Disposal

Fig. 3- ACM: In-situ storage warning

15. The AMP procedures-**Standard Operating Procedure-01-** are as follows and are summarized as above

a. Objectives – to keep the work zone safe and secured.
b. Requirements – identify all the requirements needed for handling AC in the specific site and project
c. Conduct and ensure awareness and vocational training to ACM handlers
d. Conduct a comprehensive identification and risk assessment of ACMs
e. Apply restriction / re-handling of ACM on ground-use of PPE. Ensure that workers handling ACM have the right PPEs as follows:
   i. Hard helmet
   ii. Overall suit
   iii. Gloves
   iv. Mask to be strapped tight
   v. Safety goggles
   vi. Safety shoes
   vii. Ear plugs
d. Avoid underground encountering of ACM
   i. Ensure that an authorized person (HSE) are supervising the work
   ii. Barricade the area with signage
   iii. Damp ACM
   iv. Use safety gears
   v. Dismantle ACM to be labeled, kept on plastic grounding and packed in permissible bags
   vi. Label the bags properly
   vii. Ensure shipping to proper disposal sites
e. Site selection – the disposal site should be ready to handle ACM and protect the nearby people as well The site selection criteria are as follows:
   i. Away from habitation
   ii. Avoid low lying areas
   iii. Away from water storage
   iv. To be enveloped with minimum of 8-feet height enclosure
   v. Avoid high vertical stacks
   vi. Access controlled
   vii. Proper signage enclosure
f. Proper re-handling of AMC, labeling and packing
g. Control access and ensure proper monitoring of records, specifically:
   i. Environment
   ii. Health

iii. Reporting to regulators

h. Dispose the ACM through qualified DBO Operators up to the Total Sanitary Disposal Facility (TSDF)

Table 3: LIST OF APPROVED TSDF OPERATORS IN RAJASTHAN

S. No	Operator	Address	Remark
1.	Rajasthan Waste Management Project (M/s Ramky Enviro Engineers Ltd)	Survey 1018/13, Vill-Gudli,Tehsil-Mavli, Zinc Choraha to Debari Railway Station Road, Dist Udaipur (Rajasthan).	This TSDF is for all kind of hazardous waste as listed in the hazardous waste (Management & Handling) Rules.
2.	Ramky Enviro Engineers Ltd, Balotra	Ramky BWMP Rd, Rajasthan 344032.	This TSDF is for all kind of hazardous waste as listed in the hazardous waste (Management & Handling) Rules
3.	Continental Petroleum Ltd	Bheror, Distt- Alwar	Only for Incineration

16. Label/display for TSDF disposal bags has to have clear display of the content in both English and local language as displayed under:

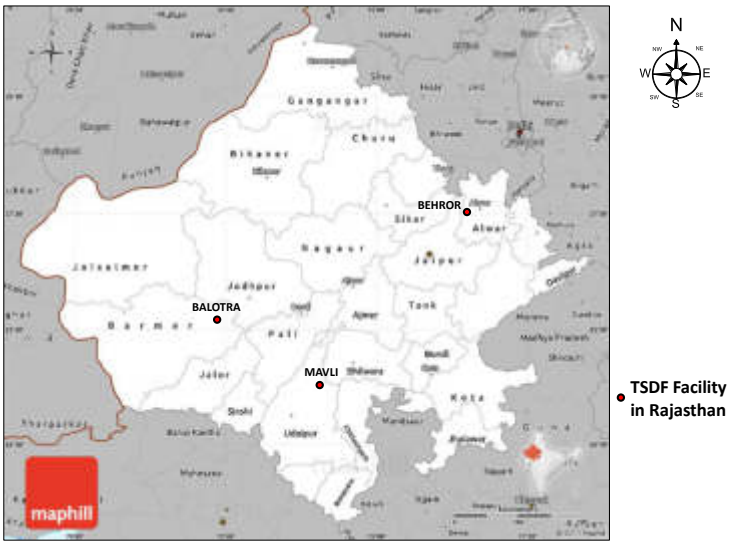


Fig 4: Map of the locations of approved TSDF in Rajasthan.

IN-SITU STORAGE ACM PIPES AREA

17. The removed undamaged ACM pipes have to be stacked properly as shown below to avoid any rolling of the pipes and eventual damage. The existing ACM Pipe stacking has to be re-handled to stack the ACM pipes properly. If the removed ACM Pipes is less than the full length of the ACM pipes, then separate stack of the same should be done with proper pre-caution and safety measures and gears.

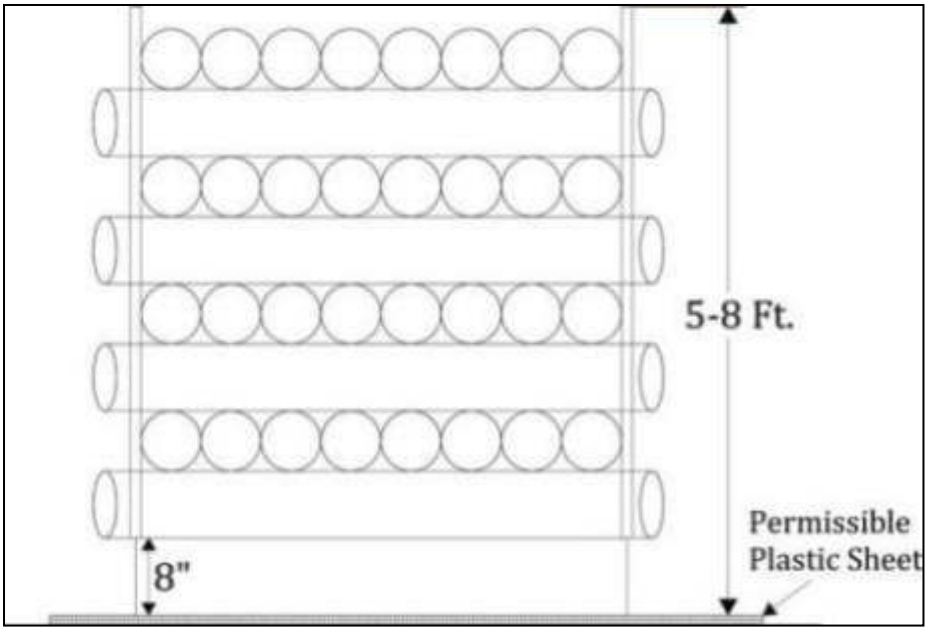


Fig. 5: Schematic diagram showing ACM Pipes stacking

18. The ACM stack has to be enveloped with proper fencing showing internal movement of person with 4.0ft corridor all around the stack. The Storage area will have display of all requisite warning and access control of the authorized person's entry and exit.

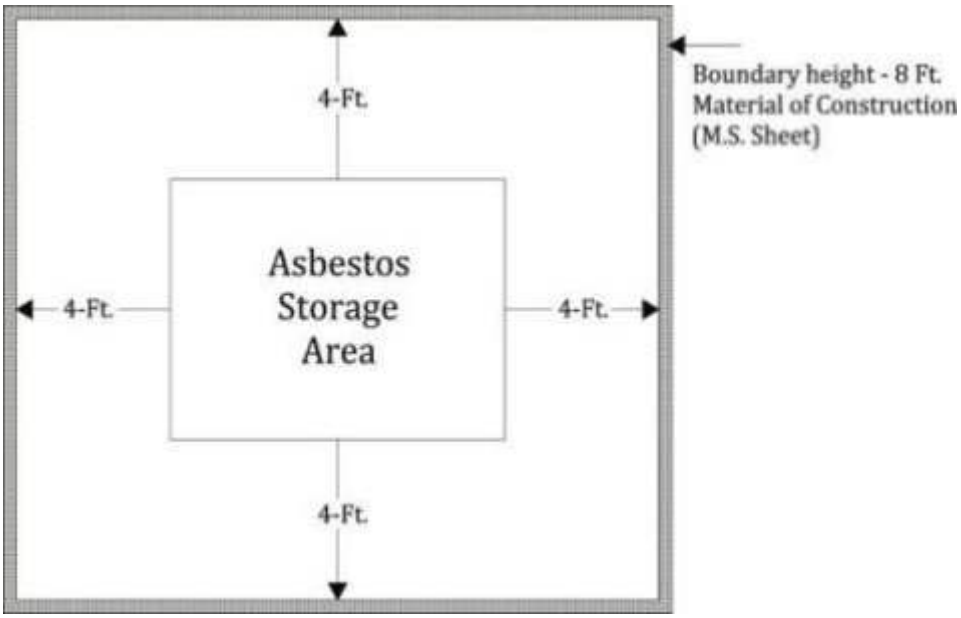


Fig. 6: Schematic diagram showing ACM Pipes storage area

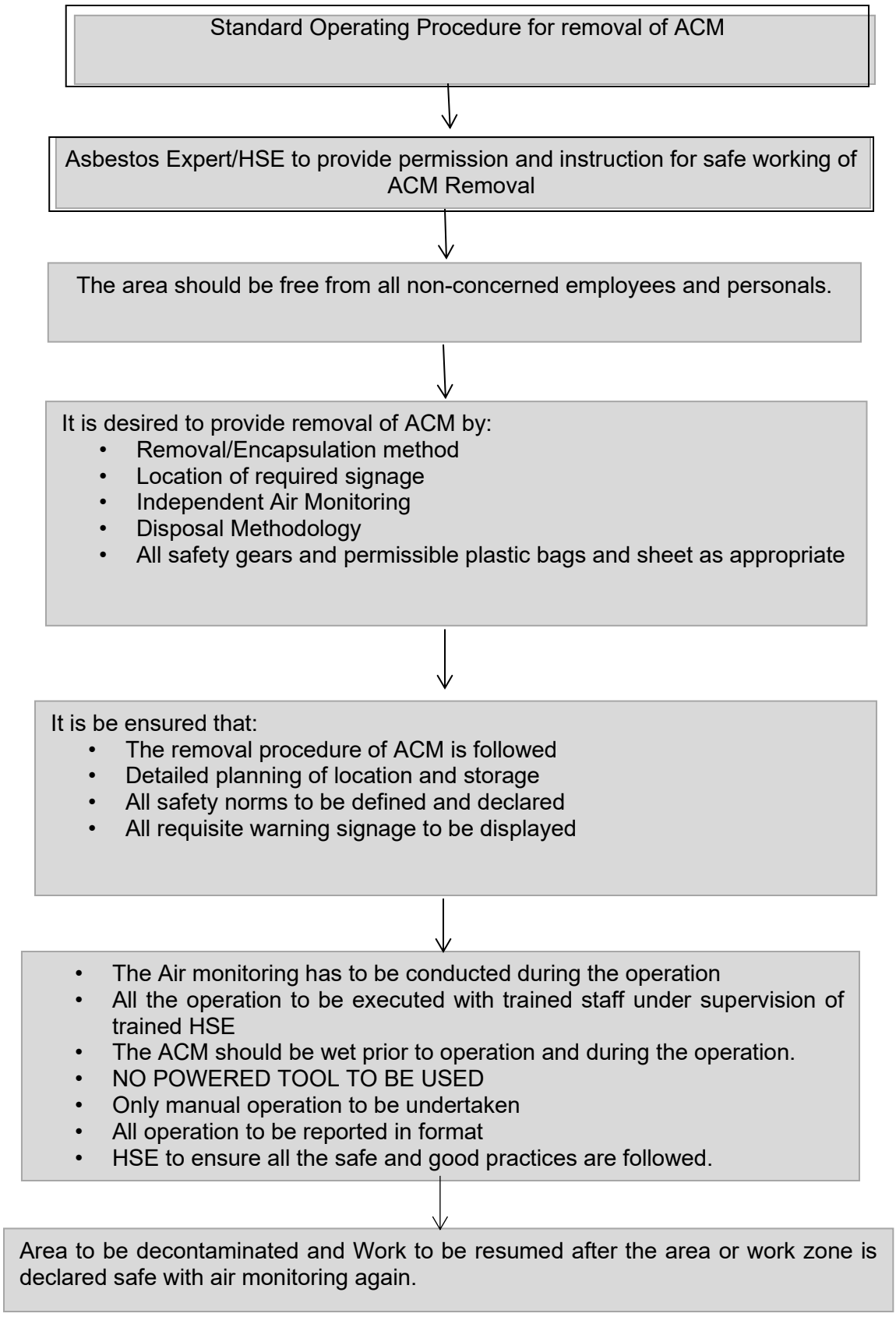


Fig. 6 -Standard Operating Procedure Flow Sheet

19. All the records in the pre-determined format are to be maintained and the disposal as stated in the applicable National legislation is to be followed. Any innovative use of the discarded ACM with the permissible law frame must be approved by respective Regulators prior to practice.

20. The format of Inventorization & records at all locations must be maintained irrespective of generation of ACM waste. The format of documentation must be uniform in order to track and trace the details as desired.

21. Based on the outcome of the workshop it was essential to enumerate the standard operating procedure & define the roles and responsibilities (already discussed as above) and the re-handling cost of the ACM as stated below:

Table 4- Suggestive Protective measures & Estimation of the cost of Re-Handling of ACM

1	Re-Handling			
	Re-handling of AC Pipes scattered/used in the premises.	• Re-Handling of the old AC Pipes in the premises needs to be quantified and a proper inventorization has to be prepared. • The isolated enveloped storage sites should be away from the habituation, the pipes used for fencing, tree guard needs to be re-handled & stored in the nearest isolated storage site and the damaged pipes/broken pipes have to be disposed off to the TSDF with all pre-cautionary measures. **NOTE:** Only powered/ grounded ACM will have to be disposed off to TSDF.	Manpower engaged: Trained labor, Supervisor, HSE Experts/Asbestos Expert	The re-handling cost will be part of the laying program. The disposal cost is Rs.1500/MT plus freight as per actual
	Removal of encountered AC Pipes	• The damaged / broken AC Pipes have to be cautiously handled with prior moistening and packed in plastic bags (permissible plastic bags) and sent for re-use in road making or to TSDF with all signage and precautionary measures as suggested above.	Manpower engaged: Trained labor, Supervisor, HSE Experts/Asbestos Expert	As stated above
	Storage	• The existing storage stacks have to be shielded with 8.0 ft height and above ground (min1.0 ft) The Pipes shall be stored in stacks with stoppers provided at the bottom layer to keep the pipe stack stable. The stack, particularly of smaller diameter pipes, shall be in pyramid shape. Pipes shall not be stacked more than 1.5 m high. Each stack shall have pipes of the same type and size only. Removal of pipes shall start from the top layer and by pulling from one end, if required, with all safety precautions. A pipe shall not be stored inside another pipe. The pipes	Manpower engaged: Trained labor, Supervisor, HSE Experts/Asbestos Expert	As on daily wages

		may also be placed alternately length and crosswise. They shall be stored on horizontal racks supported throughout their lengths on a reasonably flat surface free from stones and sharp projections. They should not be stacked in large piles, especially under warm conditions. Open ends of pipes to be sealed with permissible polythene.		
	Transportation	• Full length pipes • Damaged/Broken Pipes	Authorised agency	As per actual.
	Disposal			
	Isolated storage	The storage area should be twice the area required for storage of ACM	Manpower engaged: Trained labor, Supervisor, HSE Experts/Asbestos Expert. Authorised vendor. Boundary, signage, safety aspects etc	As stated in Table1.1.
	Sent to TSDF	The damaged/broken pipes will be packed in permissible Poly bags and has to be stored in defined location within the isolated storage. The records pertaining to the disposal (within 90 days of generation) have to be made systematic. Possibilities of using the broken pipes in wet conditions in road making in order to bind the asbestos fibers can be explored.	Authorised agency	Freight as per actual.
Estimation of suggestive protective and preventive measures				
	Air Quality sampling & Analysis-Asbestos fiber count	Personal sampler, phase contrast microscope, In case of asbestos dust, the same shall not exceed 2 mg/Nm3. Per the OSHA standards for asbestos, exposure monitoring and medical surveillance of workers is required when the Workers are or will be exposed to airborne concentrations of fibers of asbestos at or above OSHA's exposure limits for a combined total of 30 or more days per year; Workers perform work that disturbs asbestos-containing material (ACM) or presumed asbestos-containing material (PACM) for a combined total of 30 or more days per year. Minimum 3 locations (@120deg from each location) at min 500 m from the isolated storage of ACM and one sampling near the encountered site. The frequency of monitoring should be bi-annually.	Approved/accredited laboratory	As stated above.

	PPE's	Hard helmet, double strapped mask, safety tapes, boots(non laced), gloves, safety suits, goggles, ear plugs,	Standard make, minimum-4 sets at each site	As stated Above
	Education & Training	Awareness, New induction training and inspections	Asbestos expert/HSE Experts	As stated Above
	Medical Check up	As per norms or in consultation with Medical Practitioner.	Medical Doctor	As stated Above

Note:
Efforts should be made to minimize the existing AC water pipes. In areas where ACM are stored, it is required to have induction training of AMP, complete the formats and maintain the records.
Removals of used AC Pipes for fencing, boundary wall etc have to be carefully removed from use and stored in isolated storage.
At certain locations, it was observed that the discarded pipes was used as tree guard, when the sapling was planted as on date the tree is fully grown, in that case the removal of ACM has to be done with all precautions and use of total safety gears. Hand tools or slow-running tools producing coarse dust or chips shouldbe used where practicable rather than high-speed machines or those which cut by abrading the material after wetting. Alternatively, the same can also be bounded properly by bitumen paint.
The coarse dust and pieces in wet conditions will have to be collected in permissible plastic bags with use of all safety gears.
The collected wastes are to be labeled as stated above and disposed off to TSDF. The records of the same will have to be kept on daily basis and summarized to monthly basis.

FORM I – ASBETOS INVENTORY, INSPECTION AND ACTION FORM

Format: RUIDP/IIA/ LOCATION/NAME OF DBO CONTRACTOR/HSE 002/YEAR	
Location:	
Site co-ordinates:	
Elevation:	**Team:**
Date of visit	**Sign:**

Present Status		Indicate if installed, operational, in storage, etc.
Original age		Months or years since installation
Diameter		mm or inches
Length		meters
Volume		
Total packet		
Packing date		
Disposal date		
Existing Site (Photo or illustrations):		
Illustration/ Design of Activities On-site with respect to existing asbestos (include details such as size of new pipes, distance from existing AC pipes, other notable observations)		
DBO Contractor Handling Asbestos:		
Number of persons handling waste		
Medical Records		

Safety Gears	
Vocational Training Last Conducted: Number of attendees: Conducted by Schedule:	
Required Actions:	
Remarks	
Conclusion/Remark **HSE Signatory**	

FORM-II – MATRIX FOR TRAINING & RECORDS

Format: RUIDP/INSP.MATRIX/LOCATION/NAME OF DBO CONTRECTOR/HSE 001/YEAR				
S. No.	**Aspects of ACM**		**Check points**	**Remarks**
Training Schedule:				
Trainer Details:				
Date/Location of Training:				
Number of attendees:				
Training Schedule, Training Materials & Attendance Sheet, Feedback of Trainees.				
Understanding of:				
A.	**DOCUMENTS AND RECORDS**			
1.	Site Inventory			
2.	List of ACM storage and installation points			
3.	Structure of ACM management committee			
B.	**INVENTORY**			
1.	Inventorization of ACM			
	Number of ACM/ pipes			
	Dimensions of ACM/ pipes			
	Total volume of ACM/ pipes			
2.	Storage facility/ installation location:			
A.	In-use	Location		
		Condition	Intact/ damaged	
		Purpose		
		Accessibility by the workers		
		Evidence of physical damage and approximate size (length, width, volume) without coming into contact with The damaged ACM		
		Impacts on the environment (Based on Asbestos fiber Monitoring)		
3.	**LABELING AND SIGNAGE**			
	Notification to workplace safety and health			
	Working instruction			
	The risks associated with exposure to asbestos fibers			
	Cautionary statement to not disturb materials containing asbestos			
4.	**PERSONAL PROTECTIVE EQUIPMENT (PEP)**			
	Record of pep			
	Mask			

	Eye glasses	
	Gloves	
	Ear muffs	
	Others	
	Training	
	On occupational risks of asbestos to the workers	Date: Time: In-house/ external: Faculty: No of workers attended:
	Training for maintenance, repair and renovation	Date: Time: In-house/ external: Faculty: No of workers attended:
	Training for workers working with asbestos	Date: Time: In-house/ external: Faculty: No of workers attended:
	Periodic air quality monitoring records	• Within the permissible limits • Not within the permissible limits (specify the reason)
	Workers medical check-up records	Date: In-house/ external: Performed by: Remarks: No of workers attended:
Conclusion/Remark **HSE Signatory**		

The all the data required in Form-II will be filled by the DBO Operator (HSE-Officer), the records of this document has to be maintained for a pre-decided life. Details of training imparted have to be file with appropriate evidence like photographs, feedback form**,** videos etc. There has to be a proper documentation of the records kept with highest level of transparencies to retrieve, trace and track the records as necessary. The records maintained by the DBO Operator, has to be audited regularly by the ACM-Expert.

Form-I has to be accompanied with Form-II. Defined period of Air Quality monitoring and health will have to be minimum twice a year. Where ever the fiber counts are found/ recorded beyond the permissible norms, corrective action, like:

- Cordon off the area of ACM
- HSE team with trained experts to be deputed for the task
- Moisten the ACM prior to handling
- Storage area of the ACM stacks to be covered
- The damaged/deteriorated ACM to be re-handled in presence of Asbestos Expert/ HSE (Trained) with all defined norms and safety gears.
- Disposal of damaged/deteriorated ACM to be done as per the Norms.
- Records of disposal to be maintained.
- Keep all requisite evidence in form of documentation, geo-tagged photographs etc
- Frequency of health monitoring at such locations to be increased.

Form-III-AIR QUALITY MONITORING AND RESULTS

Format: RUIDP/AQMR/ LOCATION/NAME OF DBO CONTRACTOR/HSE 003/YEAR			
Vendor details Approvals			
S.No	Location	Agency	Results& Permissible Norms
Conclusion/Remark HSE Signatory			

FORM-IV-MEDICAL HISTORY

Format: RUIDP/MH/ LOCATION/NAME OF DBO CONTRACTOR/HSE 004/YEAR							
Employee code:							
Employer Details:							
PPE Used:							
Insurance/ESI							
S. No	Name	Age/Sex/DBO	Address/ Contact details:	Period of Employment/ Job Title	Pre-History	Doctor's comments	HSE Remarks
					Height Weight/BMI Blood group X-Ray CT Scan others Smoker: Tobacco: Alcohol Consumption: Family History: Medication if any: Eye sight: Hearing: Others:		

FORM -V

[FORM-10- as per rule 19 (1) of Hazardous waste Handling & Management Rules-2016]

MANIFEST FOR HAZARDOUS AND OTHER WASTE

1.	Sender's name and mailing address (including Phone No. and e-mail) :			
2.	Sender's authorisation No.	•		
3.	Manifest Document No.	•		
4.	Transporter's name and address: (including Phone No. and e-mail)			
5.	Type of vehicle	•		(Truck/Tanker/Special Vehicle)
6.	Transporter's registration No.	•		
7.	Vehicle registration No.	•		
8.	Receiver's name and mailing address (including Phone No. and e-mail) :			
9.	Receiver's Authorisation No.			
10.	Waste description	•		
11.	Total quantity No. ofContainers	•		……..m^3 or MT ……..Nos.
12.	Physical form			(Solid/Semi-Solid/Sludge/Oily/Tarry/Slurry/Liquid)
13.	Special handling instructions and additional information			
14.	Sender's Certificate			I hereby declare that the contents of the consignment are fully and accurately described above by proper shipping name and are categorised, packed, marked, and labeled, and are in all respects in proper conditions for transport by road according to applicable National Government regulations.
	Name and stamp:	Signature:		Month / Day / Year
15.	Transporter acknowledgement of receipt of Wastes			
	Name and	Signature:		Mont / Day / Year

	stamp:			h		
16.		Receiver's certification for receipt of hazardous and other waste				
	Name and stamp:	Signature:		Month	Day	Year

FORM –VI: IN-SITU STORAGE OF ACM

S. No	Activity	Number of Stacks	Area occupied	Details of ACM Pipes		Day/month/year Of storage
Site History						
For existing Stacks, details of re-handling of pipes in number or volume to be mentioned under supervision of Authorized Experts.						
Details of Location of re-handled ACM storage, new area should be • Minimum 10-15 ft away from campus habituation. • 250m away from the water sources • 500-800m away from Children play area • The area should be isolated and covered from all the sides with restricted Access for Authorised Experts Only. • Register to be maintained for Entry& Exit of personals. • Register to be maintained for Entry & Exit of ACM • Labels to be displayed in legible format • Specific training of ACM to be inducted in the ACM storage area for residing population in the campus.						
Details of transit storage of ACM to be maintained as per norms in an isolated storage room full covered						

Standard Operating Procedure-02

Asbestos Fiber Monitoring, Analysis and Identification

Principle

1. The collection of environmental samples including air must follow an appropriate sampling procedure. A review of method for sampling of asbestos fibers has been published (IPCS, 1986). The most commonly used analytical method involves phase contrast optical microscopy (PCOM) in the work place and transmission electron microscopy (TEM) in the general environment. The phase contrast optical microscopy (POCM) is universally recommended for asbestos analysis (Eache and Groff, 1997; Dion and Perrault, 1994) including Bureau of Indian Standard. POCM coupled with polarized light is largely used for asbestos analysis in solid samples (USEPA, 1993). The fiber monitoring has to be done by any NABL/MOEF&CC accredited laboratory either in-house or by third party.

Monitoring of Asbestos Fiber in Air

2. A general survey of inside and outside the storage sites of the work zone has to be conducted to choose the sampling sites. Sampling is to be carried out at visually selected locations appeared more prone to emission or possibility of release of asbestos fiber. The sample

collected by drawing a measured quantity of air through cellulose ester a membrane filter by a battery operated sampling pump that was fully charged to operate continuously over the chosen sampling time. The exposed filters will then be placed into plastic petri dishes and transferred carefully to the laboratory.

3. Two types of samples are to be taken, one within the workers breathing zone that is 300 mm radius extending in front of the face, and measured from the midpoint of a line bisecting the ears called personal samples. The samples taken at a fixed location mostly near to the source point called area or static samples. Personal sampler model “XX 5700000” and low volume vacuum/pressure pump model “XX5622050” attached with monitor or cowl model “MAWP025AC” of Millipore Corporation, USA are to be used for the collection of personal and area samples, respectively. The flow rate of pump is to be adjusted to 1litre per minute. The flow rate checked before and after in each monitoring, those samples showing the difference by >10 percent from the initial flow rate are to be rejected. In both the samples filter holder (Cowl) always pointed downward position to avoid the deposition of heavy particles. An ester cellulose membrane filters “AAWP02500” having 0.8 µm-1.2 µm pore size diameter are to be used throughout the sampling for asbestos counts at work environment.

Mounting Procedure

4. Complete filter is to be placed on clean microscopic slide, dust side up at room temperature. Electrostatic force keeps the filter usually on the slide. Filters are to be exposed to acetone fumes and triacetin (Glycerol triacetate, Sigma). In this procedure a small quantity of acetone in round bottom flask (500-1000ml) heated at the boiling point underwater bath, the vapors condensed in a simple condensing column. When the sufficient fumes of acetone become ready then pass it throughout on the filter for 3-5 seconds at a distance of 15-25 mm. put the 1-3 drops of Glycerol Triacetate (Triacetin) on the acetone-cleared filter. Place a cover slip on cleared filter by avoiding the air bubbles. Heat the cleared filter at 50°c for 15 minutes and leave it at room temperature for 24 hours under the action of triacetin to clear entire filter. Alternatively, membrane filter can also be made transparent with immersion oil (Leica Microsystems Wetzlar GmbH, Wetzlar). Using a phase contrast microscope with polarized light, Laborlux S (of M/s Leica, Germany) and then counting has to be done at magnification 400X-500x

$C = A/a \times N/n \times 1/r \times 1/t$

Where:

C= concentration in fibers per cubic centimeter rounded to first place of decimal,

N = total no. of fiber counted,

n = number of graticule areas observed,

A= effective filter area in mm^2

a= graticule counting area in mm^2,

r= flow rate of air through filter in cm^3/min., and

t= single sample duration in minutes

5. To rule out the probability of the air borne asbestos in the existing scenario at the said site as well as other similar sites at the different work zones, it is necessary to have the asbestos fiber monitoring and sampling counts to be recorded at regular intervals. The environmental air sampling stations will have to be minimum three at 120 degree angle, within 1000-500 m from the ACM. The sampling frequency has to be in all three stages-Pre-Construction, Construction and Post Construction, while the personal sampling has to be done as stated above.

6. Bureau of Indian Standards (BIS) Guidelines for Safe Use of Products containing Asbestos states that “Asbestos cement products (such as AC pipes) generally contain about 10-

15% asbestos fibers in a cement matrix that comprises the rest of the materials and are termed as locked in asbestos products as these products have the asbestos fibers bound in cement. The possibilities of air borne asbestos fiber will be in case of mishandling of encountered pipes with unsafe practice. During storing and installation; recommended work practices shall be followed to avoid harmful exposure". According to Hazardous and Other Wastes (Management and Trans-boundary Movement) Rules, 2016, any waste with asbestos concentration limit of 10,000 mg/kg (i.e. 1%), however this will apply only if the asbestos containing substances are in a friable, powdered or finely divided state. Under the Basel Convention[1], asbestos or asbestos waste in the form of dust and fibers is classified as hazardous waste. The applicable legislation under the present scenario are:

[1] Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal, adopted in 1989

Summary of Asbestos Management Plan

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation/ Monitoring	Remark
Clearing, transfer and disposal of ACM pipes	Possibilities of air borne asbestos if handled unsafely, cut, drilled or broken into pieces that may cause: ❑ Inflammation of the lungs ❑ Mesothelioma ❑ Peritoneial mesotherlioma ❑ Pleural plaques ❑ Asbestosis ❑ Bronchogenic Carcinoma ❑ Second hand-exposure	Implement the AMP strictly that includes identification of hazards, the use of proper safety gear and disposal methods.	DBO Contractor /RUIDP	There has to be a suitable call to be taken for in-situ disposal if the removed ACM pipes are not damaged, full length or 4.0 ft length not damaged.
Work in narrow streets	Possibilities of air borne asbestos if handled unsafely cut, drilled or broken into pieces that may cause: ❑ Inflammation of the lungs ❑ Mesothelioma ❑ Peritoneial mesotherlioma ❑ Pleural plaques ❑ Asbestosis ❑ Bronchogenic Carcinoma Second hand-exposure	Conduct awareness program on safety during the construction work Undertake the construction work stretch-wise; excavation, pipe laying and trench refilling should be completed on the same day Provide barricades, and deploy security personnel to ensure safe movement of people and also to prevent unnecessary entry and to avoid accidental fall into open trenches Identify risk of intervention with existing AC pipes. If there is significant risk, implement the AMP strictly that includes identification of hazards, the use of proper safety gear and disposal methods.	DBO Contractor/RUIDP	All provision of safe working with proper signage has to be undertaken prior to work initiation, during the work and after the work.
Interventions in existing AC pipelines	Possibilities of air borne asbestos if handled unsafely cut, drilled or broken into pieces that may cause: ❑ Inflammation of the lungs ❑ Mesothelioma	Appropriate actions as defined in the Asbestos Management Plan will have to be adhered to	DBO Contractor/RUIDP	Measure to avoid the encounter & removal has to be prioritized and if the same is not avoided then the

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation/ Monitoring	Remark
	❑ Peritoneial mesotherlioma ❑ Pleural plaques ❑ Asbestosis ❑ Bronchogenic Carcinoma Second hand-exposure			measures stated have to be strictly followed.
Documentation /record	Unmonitored ACM might be handled incorrectly and can cause release of airborne asbestos	To be formatted and kept as mentioned in the Asbestos Management Plan	DBO Contractor/RUIDP	To be kept intact for easy tracking and reference in legible format. The same can be kept in soft format as well.

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Appendix C-21: Guidelines for Workers Camps

(Based on IFC benchmark standards for workers accommodation)

Guidelines for Workers' Accommodation

1. Availability of sufficient number of clean rooms for the workers with adequate facilities of ventilation, Drinking water, Electricity/fan/light (natural and artificial lighting) etc. in each room.
2. Camps should not be subjected to periodic flooding nor located within 200 feet of swamps, pools, sink holes or other surface collections of water. All sites should be graded, ditches and rendered free from depressions in which water may become a nuisance.
3. Accessibility to an adequate and convenient supply of potable water to the workers. Depending upon the climate, weather conditions and accommodation standards, 80 to 180 litres per persons per day water should be available and drinking water should meet the national/WHO drinking water standards.
4. Camp site should be adequately drained to avoid the accumulation of stagnant water.
5. All tanks used for the storage of drinking water should be constructed and covered as to prevent water stored therein from becoming polluted or contaminated.
6. All sites should be adequate in size to prevent overcrowding of necessary structures.
7. Camps should have Crèche facility for children with necessary arrangements.
8. The grounds and open areas surrounding the shelters should be maintained in a clean and sanitary condition free from rubbish, debris, waste papers, garbage or other refuse.
9. Beds, cots, or bunks, and suitable storage facilities such as wall lockers for clothing and personal articles should be provided in every room used for sleeping purposes.
10. A separate bed for each worker should be provided. Double deck bunks are not advisable for the safety and hygiene reasons and their use should be minimized. If they are used there must be enough clear space between the lower and upper bunk of the bed. Standard range is 0.7 to 1.10 meters. Triple deck bunks are prohibited.
11. All heating, cooking, and water heating equipment should be installed in accordance with State and local ordinances, codes, and regulations governing such installations. If a camp is used during cold weather, adequate heating equipment should be provided.
12. If food is provided, it should cater for different cultural needs. Kitchens should be provided with facilities to maintain adequate personal hygiene including a sufficient number of washbasins designated for cleaning hands with clean running water and materials for hygiene drying.
13. All kitchen floors, ceiling and wall surface adjacent to or above food preparation and cooking areas should be built using durable, non-absorbent, easily cleanable, non-toxic materials.
14. No person with any communicable disease shall be employed or permitted to work in the preparation, cooking, serving, or other handling of food, foodstuffs, or materials used therein, in any kitchen or dining room operated in connection with a camp or regularly used by persons living in a camp.
15. There should be recreation facilities for the camp workers i.e. TV/sports/newspaper/magazine etc.
16. There should be facility of mosquitoes prevention and control i.e. use of mosquito net/coil/electric repellent/pesticide etc.
17. Sanitary and toilet facilities should be constructed of the materials that are easily cleanable. Standard range of the toilets varies from 1 unit for 6 persons to 15 persons. For urinals, standards are 1 unit for 15 persons.
18. There is no need to provide separate urinals in any place where less than 50 workers are employed or where the latrines are connected to water borne sewage system.
19. Sanitary and toilet facilities should be designed to provide workers with adequate privacy including ceiling to floor partitions and lockable doors.

20. Separate toilet and bathing facilities should be available for Men and women. These facilities shall be distinctly marked "for men" and "for women" by signs printed in English and in the native language of the persons using the facilities, and/or marked with easily understood pictures or symbols.
21. Workers' gender, religious, cultural and social backgrounds should be respected. In particular, workers should be provided with the possibility of celebrating religious holidays and observances.
22. No pets, birds or livestock should be kept or fed unless approved by management or camp operator.
23. There should be proper arrangement of colour coded dustbins i.e. Green for wet/biodegradable wastes, blue for dry/non-biodegradable waste and red for safe disposal of domestic hazardous waste i.e. sanitary napkins and diapers.
24. There should be adequate facility for waste water management (i.e. septic tanks/soak pits) and for disposal of Municipal solid waste (i.e. composting).
25. The person in charge of managing the accommodations has a specific duty to report to the health authorities the outbreak of any contagious diseases, food poisoning and any other important casualties.
26. Guidance on the detrimental effects of the abuse of alcohol and drugs and other potentially harmful substances and the risk, concerns related to HIV/AIDS and other health risk related activities should be provided to the workers through group/individual orientations and should also be displayed at camps as visual boards.
27. Workers should have easy access to medical facilities and medical staff where possible female doctors/nurses should be available for female workers. Regular health check up should be done for the workers. First-AID Kit/Health care facilities should be available in the camps. There should be proper demarcation/display of First Aid facility and First Aider.
28. A specific fire safety plan should be prepared including training of fire wardens, periodic testing and monitoring of fire safety equipments.
29. All key contacts, emergency contact number, including nearby hospital should be posted in a prominent place and in all languages present e.g., at camp gate and throughout the camp.

Appendix C-22: Guidelines for Safety in Chlorine Usage
Instructions for Storage and Handling of Chlorine Cylinders

(Based on the 'Manual on Operation and Maintenance of Water Supply Systems' published by the Central Public Health and Environmental Engineering Organization (CPHEEO) in 2005)

1.1Storage Area

- Obtain storage license from controller of explosives under Gas Cylinder Rules 2004 if the quantity of Cl2 containers to be stored is more than 5 Nos.
- Storage area should be cool, dry, well ventilated, and clean of trash and protected from external heat sources. Please refer to Manual on "Water Supply and Treatment", (1999 Edition), for further details.
- Ventilation must be sufficient to prevent accumulation of vapour pockets. The exhaust should be located either near the floor or duct be provided extending to the floor. All fan switches should be outside the storage area.
- Do not store container directly under the sun.
- Weather cock should be installed near the storage to determine wind direction.
- The storage building should be of non-combustible construction with at least two exits opening outside.
- Neutralization system should be provided.
- Continuous monitoring of chlorine leak detection equipment with alarm should be installed in the storage area.
- The area should be free and remote from elevators, gangways or ventilating system to avoid dangerous concentration of Chlorine during leak.
- Two portable foam type fire extinguishers should be provided in the premises.
- Corrosive substances shall not be stored nearby which react violently with each other.
- Unauthorized person should not be allowed to enter into the storage area.
- The floor level of storage shed should be preferably 30 cms (at least one foot) higher from the ground level to avoid water logging.
- Ensure that all containers are properly fitted with safety caps or hooks.

1.2. Cylinder & Drum Containers

- Store chlorine cylinders upright and secure them so that they do not fall.
- Drum containers should be stored on their sides on rails, a few inches above the floor. They should not be stacked one upon the other. They should be stored such that the valves are in vertical plane.
- Keep enough space between containers so as to have accessibility in case of emergency.
- Store the containers in a covered shed only. Keep them away from any source of heat as excessive heat may increase the pressure in container which will result into burst.
- Do not store explosives, acids, turpentine, ether, anhydrous ammonia, finely divided metals or other flammable material in the vicinity of Chlorine.
- Do not store containers in wet and muddy areas.
- Store filled and empty containers separately.
- Protective covers for valves are secured even when the containers are empty, except during use in the system.
- Never use containers as a roller to move other equipment.
- Never tamper with fusible plugs of tonners.
- Check leakages every day by means of ammonia torch. However, it should not be touched to brass components like valves of container for safety.
- Never carry out any welding work on the chlorine system as combustion of steel takes place at 2510C in presence of chlorine.

- The boxes containing emergency kit, safety applications and self contained breathing apparatus should be kept in working order in an easily approachable area.

1.3. Use of Cylinders & Drum Containers in Process System

- Use containers in the order of their receipt, as valve packing can get hardened during prolonged storage and cause gas leaks.
- Do not use oil or lubricant on any valve of the containers.
- Badly fitting connections should not be forced and correct tool should always be used for opening and closing valves. They should never be hammered.
- The area should be well ventilated with frequent air changes.
- Transport the cylinders to the process area by using crane, hoist or railings etc.
- The drum containers should be kept in a horizontal position in such a way that the valves are in a vertical plane. The upper valve gives out gas and the lower one gives out liquid chlorine.
- The cylinder should be kept in upright position in order to release gas from the valve. For liquid chlorine withdrawal, it should be inverted with the help of an inverted rack.
- Connect the containers to the system by using approved accessories.
- Use copper flexible tube, with lead washer containing 2 to 4% antimony or bonded asbestos or teflon washer. Use yoke clamp for connecting chlorine container.
- Never use rubber tubes, PVC tubes etc. for making connections.
- Use the right spanner for operating the valve. Always keep the spanner on the valve spindle. Never use ill fitting spanner.
- After making the flexible connection, check for the leakage by means of ammonia torch but it should not come in contact with a valve.
- Keep minimum distance between the container valve and header valve so that during change-over of the container, minimum amount of gas leaks.
- The material of construction of the adopter should be same as that of valve outlet threads. o. The valve should not be used as a regulator for controlling the chlorine. During regulation due to high velocity of Chlorine, the valve gets damaged which in turn can cause difficulty in closing.
- The tools and other equipment used for operating the container should be clean and free of grease, dust or grit.
- Wear breathing apparatus while making the change-over of the container from the process header.
- Do not heat the container to withdraw more gas at faster rate.
- Use pressure gauge and flow measuring device to control the flow and to know the quantity of gas left in the container.
- Use an inverted U type barometric leg or vacuum breaking arrangement for connecting the container to the process piping.
- Withdrawal of the gas should be stopped when the gas pressure inside the container is between 0.1 to 0.5 kg/cm2 approximately.
- If withdrawal of the gas from the container connected to the process system has to be suspended for long intervals, it should be disconnected from the system, and the valve cap and hood replaced.
- Gas containers should be handled by trained persons only.

1.4. Disconnecting Containers from Process System

- Use breathing apparatus before disconnecting the container.
- First close the container valve fully. After removal of chlorine the process valve should be closed.
- Remove the flexible connection, plug the flexible connection in order to avoid entry of humid air. Replace the valve cap or hood on the container.

- Put the tag on the empty container & bring it to storage area marked for empties. e. Check for the leakage.

1.5. Loading and Unloading of Containers

- The handling of containers should be done under the supervision of trained and competent person.
- It should be done carefully with a crane, hoist or slanted ramp. Do not use magnet or sharp object for lifting the containers.
- Small cylinders should not be lifted by means of valve caps as these are not designed to carry the weight.
- The containers should not be allowed to strike against each other or against any hard object.
- Vehicles should be braked and isolated against any movement.
- After loading, the containers should be secured properly with the help of wooden wedges, rope or sling wire so that they do not roll away.
- The containers should never be dropped directly to the ground or on the tyre from the vehicle.
- There should be no sharp projection in the vehicle.
- Containers must have valve caps and plugs fitted properly.
- Check containers for leakage before loading/unloading.

1.6. Transportation of Container

- The name of the chemical along with diamond pictorial sign denoting the dangerous goods should be marked on the vehicle.
- The name of the transporter, his address and telephone number should be clearly written on the vehicle.
- The vehicle should not be used to transport any material other than what is written on it. d. Only trained drivers and cleaners should transport hazardous chemical
- The driver should not transport any leaking cylinder.
- The cylinder should not project outside the vehicle.
- The transporter must ensure that every vehicle driver must carry “Trem Card” (Transport Emergency Card) and ‘Instructions in writing booklet’ and follow them.
- Every driver must carry safety appliances with him, viz; Emergency kit, breathing apparatus etc.
- The vehicles must be driven carefully, especially in crowded localities and on bumpy roads. Do not apply sudden brakes.
- Check for the leakage from time to time.
- In the case of uncontrollable leakage, the vehicle should be taken to an open area where there is less population.

1.7. Emergency Kit: It consists of various tools and appliances like gaskets, yokes, studs, tie rods hoods, clamps, spanners, mild steel channels, screws, pins, wooden pegs etc. of standard sizes. Separate kits are used for cylinders and tonners. All the gadgets are designed for using in controlling or stopping the leakages from valves, fusible plug and side walls of cylinders and containers used for handling chlorine.

- Leakage may occur through the valve. There are basically four types of valve leaks.
  - Valve packing
  - Valve seat
  - Defective inlet thread
  - Broken valve thread

- Leakage may occur through container wall. For controlling such leakages, clamps are used for cylinders and chain and yoke arrangement is used for tonner. Sometimes wooden peg is used by driving into the leaking hole as a temporary arrangement.
- Leakage may occur through fusible plug.
  - If the leakage is through the threads of fusible plug, yoke, hood and cap nut arrangement is used to control the leak.
  - If fusible metal itself in the plug is leaking, yoke and stud arrangement is used to control the leak.

2. First Aid to be Provided for a Person Affected by Chlorine

a. General Remove the affected person immediately to an uncontaminated area. Remove contaminated clothing and wash contaminated parts of the body with soap and plenty of water. Lay down the affected person in cardiac position and keep him warm. Call a physician for medical assistance at the earliest. Caution: Never attempt to neutralize chlorine with other chemicals.

b. Skin Contact Remove the contaminated clothes, wash the affected skin with large quantity of water. Caution: No ointment should be applied unless prescribed by the physician.

c. Eye Contact If eyes get affected with liquid chlorine or high concentration of chlorine gas, they must be flushed immediately with running water for atleast 15 minutes keeping the eyelids open by hand. Caution: No ointment should be used unless prescribed by an eye specialist.

d. Inhalation If the victim is conscious, take him to a quiet place and lay him down on his back, with head and back elevated (cardiac position). Loosen his clothes and keep him warm using blankets. Give him tea, coffee, milk, peppermint etc. for making good effect on breathing system. If the victim is unconscious, but breathing, lay him down in the position mentioned above and give oxygen at low pressure until the arrival of doctor. If breathing has stopped, quickly stretch him out on the ground or a blanket if available, loosen his collar and belt and start artificial respiration without delay. Neilson arm lift back pressure method is useful. Automatic artificial respiration is preferable if available. Continue the respiration until the arrival of the doctor. Amboo bag can also be used for this purpose.

3. On-Site Emergency Plan to Cover the Leakage of Chlorine

3.1. Introduction As chlorine is a hazardous chemical, handling and storage of it demand adequate precautions to avoid possible hazards. Leakage of chlorine may develop into a major emergency. Therefore, the emergency procedure to cover this eventuality is essential. It is drawn in the form of on-site emergency plan. The elements of onsite emergency plan are as follows:

3.2. Identification of Hazard Chart

In this case the site risk is evaluated by the expert and the extent of the probable damage is calculated on the basis of stored chlorine quantity, nearby population, wind direction, type of equipment failure etc. For this purpose, hazard analysis is conducted in which case all the hazardous properties of chlorine are considered. If evacuation is required, the range of it is calculated.

3.3. Appointing Key Persons In order to control the incident like chlorine leakage, it is essential to appoint various persons with their well-defined responsibilities. Taking into account the various activities likely to be involved, the following key persons are

appointed (i) Site Controller, (ii) Incident controller, (iii) Shift Executive In charge, (iv) Communication Officer, (v) Safety Officer, (vi) Fire and Security Officer, (vii) Utilities and Services In charge, (viii) Traffic Controller, (ix) First Aider

3.4. Assembly Points These points are set up where persons from the plant would assemble in case of chlorine leakage. At these points the in-charge for counting the heads will be available.

3.5. Emergency Control Centre
The control centre is the focal point in case of an emergency from where the operations to handle the emergency from are directed and coordinated. It contains site plan, telephone lines, public address system, safety equipment, first aid boxes, loud speaker, torches, list of essential telephone numbers, viz. fire brigade, police, hospital, civil defence, collector, factory inspector, organizational authorities, chlorine suppliers, mutual aid group, social workers, list of key persons and their addresses, copy of chemical fact sheet, location plan of fire hydrant, details of dispersion model of chlorine gas, population distribution pattern, location of alarm system.

3.6. Procedure to Meet Emergency
The actions to be taken by the staff and authority are given below; Emergency Alarm: An audible emergency alarm system is installed throughout the plant. On hearing the alarm the incident controller will activate the public address system to communicate with the staff about the emergency and give specific instructions for evacuations etc. anyone can report the occurrence of chlorine leakage to section in-charge or incident controller through telephone or intercom or in person.

3.7. Communication
Communication officer shall establish the communication suitable to that incident.

3.8. Services
For quickness and efficient operation of emergency plan the plant is divided into convenient number of zones and clearly marked on the plan. These are emergency services viz. firefighting, first aid, rescue, alternative source of power supply, communication with local bodies etc. The incident controller will hand over the charge to the site controller of all these coordinating activities, when the site controller appears on the site. The site controller will coordinate all the activities of the key persons. On hearing the emergency alarm system all the key persons will take their charge. Incase of their absence other alternatives are nominated. The person nominated for personnel and administration purposes will be responsible for informing all statutory authorities, keeping account of all persons in the plant including contract labour, casual workers and visitors. He will be responsible for giving information to press or any outside agencies. He is also responsible for organizing canteen facilities and keeping informed the families of affected persons. The person nominated as security officer should guide police, fire fighting and control the vehicle entries. The site controller or any other nominated person will announce resumption of normalcy after everything is brought under control. The onsite emergency plan needs to be evaluated by mock drill. Any weaknesses noticed during such drills should be noted and the plan is modified to eliminate the weaknesses.

3.9. Emergency
Measures In case of leakage or spillage of Chlorine, the following emergency measures should be taken:

- Take a shallow breath and keep eyes opened to a minimum.
- Evacuate the area.

- Investigate the leak with proper gas mask and other appropriate Personal protection.
- The investigator must be watched by a rescuer to rescue him in emergency.
- If liquid leak occurs, turn the containers so as to leak only gas.
- In case of major leakage, all persons including neighbours should be warned.
- As the escaping gas is carried in the direction of the wind all persons should be moved in a direction opposite to that of the wind. Nose should be covered with wet handkerchief.
- Under no circumstances should water or other liquid be directed towards leaking containers, because water makes the leak worse due to corrosive effect.
- The spillage should be controlled for evaporation by spraying chilled water having temperature below 9.4oC. With this water crystalline hydrates are formed which will temporarily avoid evaporation. Then try to neutralize the spillage by caustic soda or soda ash or hydrated lime solution carefully. If fluroprotein foam is available, use for preventing the evaporation of liquid chlorine.
- Use emergency kit for controlling the leak.
- On controlling the leakage, use the container in the system or neutralize the contents in alkali solution such as caustic soda, soda ash or hydrated lime. Caution: Keep the supply of caustic soda or soda ash or hydrated lime available. Do not push the leaking container in the alkali tank. Connect the container to the tank by barometric leg.
- If container commences leak during transport, it should be carried on to its destination or manufacturer or to remote place where it will be less harmful. Keeping the vehicle moving will prevent accumulation of high concentrations.
- Only specially trained and equipped workers should deal with emergency arising due to major leakage.
- If major leak takes place, alert the public nearby by sounding the siren.
- Any minor leakage must be attended immediately or it will become worse.
- If the leakage is in the process system, stop the valve on the container at once.

3.10. Safety Systems Required at Chlorination Plant

The following safety systems should be kept ready at the chlorination plant:

- Breathing apparatus.
- Emergency kit.
- Leak detectors.
- Neutralisation tank.
- Siren system.
- Display of boards in local language for public cautioning, first aid and list of different authorities with phone numbers.
- Communication system.
- Tagging system for equipment’s.
- First aid including tablets and cough mixtures.
- Exhaust fans.
- Testing of pressure vessels, chlorine lines etc. every year as per factory act.
- Training & mock drill.
- Safety showers.
- Eye fountain.

- Personal protective equipment.
- Protecting hoods for ton-containers.
- Fire extinguishers.
- Wind cock.

Appendix C-23: Guidelines for Prevention and Control of COVID-19
WHO Interim Guidance on Water, Sanitation, Hygiene and Waste Management for the COVID19 virus

World Health Organization

unicef

Water, sanitation, hygiene, and waste management for the COVID-19 virus

Interim guidance
19 March 2020

Background

This interim guidance supplements the infection prevention and control (IPC) documents by summarizing WHO guidance on water, sanitation and health care waste relevant to viruses, including coronaviruses. It is intended for water and sanitation practitioners and providers and health care providers who want to know more about water, sanitation and hygiene (WASH) risks and practices.

The provision of safe water, sanitation, and hygienic conditions is essential to protecting human health during all infectious disease outbreaks, including the COVID-19 outbreak. Ensuring good and consistently applied WASH and waste management practices in communities, homes, schools, marketplaces, and health care facilities will help prevent human-to-human transmission of the COVID-19 virus.

The most important information concerning WASH and the COVID-19 virus is summarized here:

- Frequent and proper hand hygiene is one of the most important measures that can be used to prevent infection with the COVID-19 virus. WASH practitioners should work to enable more frequent and regular hand hygiene by improving facilities and using proven behavior-change techniques.
- WHO guidance on the safe management of drinking-water and sanitation services applies to the COVID-19 outbreak. Extra measures are not needed. Disinfection will facilitate more rapid die-off of the COVID-19 virus.
- Many co-benefits will be realized by safely managing water and sanitation services and applying good hygiene practices.

Currently, there is no evidence about the survival of the COVID-19 virus in drinking-water or sewage. The morphology and chemical structure of the COVID-19 virus are similar to those of other human coronaviruses for which there are data about both survival in the environment and effective inactivation measures. This document draws upon the evidence base and WHO guidance on how to protect against viruses in sewage and drinking-water. This document will be updated as new information becomes available.

1. COVID-19 transmission

There are two main routes of transmission of the COVID-19 virus: respiratory and contact. Respiratory droplets are generated when an infected person coughs or sneezes. Any person who is in close contact with someone who has respiratory symptoms (sneezing, coughing) is at risk of being exposed to potentially infective respiratory droplets.[1] Droplets may also land on surfaces where the virus could remain viable; thus, the immediate environment of an infected individual can serve as a source of transmission (contact transmission).

Approximately 2–10% of cases of confirmed COVID-19 disease present with diarrhoea,[2-4] and two studies detected COVID-19 viral RNA fragments in the faecal matter of COVID-19 patients.[5,6] However, only one study has cultured the COVID-19 virus from a single stool specimen.[7] There have been no reports of faecal–oral transmission of the COVID-19 virus.

2. Persistence of the COVID-19 virus in drinking-water, faeces and sewage and on surfaces.

Although persistence in drinking-water is possible, there is no evidence from surrogate human coronaviruses that they are present in surface or groundwater sources or transmitted through contaminated drinking water. The COVID-19 virus is an enveloped virus, with a fragile outer membrane. Generally, enveloped viruses are less stable in the environment and are more susceptible to oxidants, such as chlorine. While there is no evidence to date about survival of the COVID-19 virus in water or sewage, the virus is likely to become inactivated significantly faster than non-enveloped human enteric viruses with known waterborne transmission (such as adenoviruses, norovirus, rotavirus and hepatitis A). For example, one study found that a surrogate human coronavirus survived only 2 days in dechlorinated tap water and in hospital wastewater at 20°C.[8] Other studies concur, noting that the human coronaviruses transmissible gastroenteritis coronavirus and mouse hepatitis virus demonstrated a 99.9% die-off in from 2 days[9] at 23°C to 2 weeks[10] at 25°C. Heat, high or low pH, sunlight, and common disinfectants (such as chlorine) all facilitate die off.

It is not certain how long the virus that causes COVID-19 survives on surfaces, but it seems likely to behave like other coronaviruses. A recent review of the survival of human

coronaviruses on surfaces found large variability, ranging from 2 hours to 9 days.[11] The survival time depends on a number of factors, including the type of surface, temperature, relative humidity, and specific strain of the virus. The same review also found that effective inactivation could be achieved within 1 minute using common disinfectants, such as 70% ethanol or sodium hypochlorite (for details, see Cleaning practices).

3. Keeping water supplies safe

The COVID-19 virus has not been detected in drinking-water supplies, and based on current evidence, the risk to water supplies is low.[12] Laboratory studies of surrogate coronaviruses that took place in well-controlled environments indicated that the virus could remain infectious in water contaminated with faeces for days to weeks.[10] A number of measures can be taken to improve water safety, starting with protecting the source water; treating water at the point of distribution, collection, or consumption; and ensuring that treated water is safely stored at home in regularly cleaned and covered containers.

Conventional, centralized water treatment methods that use filtration and disinfection should inactivate the COVID-19 virus. Other human coronaviruses have been shown to be sensitive to chlorination and disinfection with ultraviolet (UV) light.[13] As enveloped viruses are surrounded by a lipid host cell membrane, which is not robust, the COVID-19 virus is likely to be more sensitive to chlorine and other oxidant disinfection processes than many other viruses, such as coxsackieviruses, which have a protein coat. For effective centralized disinfection, there should be a residual concentration of free chlorine of $\geq$0.5 mg/L after at least 30 minutes of contact time at pH <8.0.[12] A chlorine residual should be maintained throughout the distribution system.

In places where centralized water treatment and safe piped water supplies are not available, a number of household water treatment technologies are effective in removing or destroying viruses, including boiling or using high-performing ultrafiltration or nanomembrane filters, solar irradiation and, in non-turbid waters, UV irradiation and appropriately dosed free chlorine.

4. Safely managing wastewater and faecal waste

There is no evidence that the COVID-19 virus has been transmitted via sewerage systems with or without wastewater treatment. Further, there is no evidence that sewage or wastewater treatment workers contracted the severe acute respiratory syndrome (SARS), which is caused by another type of coronavirus that caused a large outbreak of acute respiratory illness in 2003. As part of an integrated public health policy, wastewater carried in sewerage systems should be treated in well-designed and well-managed centralized wastewater treatment works. Each stage of treatment (as well as retention time and dilution) results in a further reduction of the potential risk. A waste stabilization pond (an oxidation pond or lagoon) is generally considered a practical and simple wastewater treatment technology particularly well suited to destroying pathogens, as relatively long retention times (20 days or longer) combined with sunlight, elevated pH levels, biological activity, and other factors serve to accelerate pathogen destruction. A final disinfection step may be considered if existing wastewater treatment plants are not optimized to remove viruses. Best practices for protecting the health of workers at sanitation treatment facilities should be followed. Workers should wear appropriate personal protective equipment (PPE), which includes protective outerwear, gloves, boots, goggles or a face shield, and a mask; they should perform hand hygiene frequently; and they should avoid touching eyes, nose, and mouth with unwashed hands.

WASH in health care settings

Existing recommendations for water, sanitation and hygiene measures in health care settings are important for providing adequate care for patients and protecting patients, staff, and caregivers from infection risks.[14] The following actions are particularly important: (i) managing excreta (faeces and urine) safely, including ensuring that no one comes into contact with it and that it is treated and disposed of correctly; (ii) engaging in frequent hand hygiene using appropriate techniques; (iii) implementing regular cleaning and disinfection practices; and (iv) safely managing health care waste. Other important measures include providing sufficient safe drinking-water to staff, caregivers, and patients; ensuring that personal hygiene can be maintained, including hand hygiene, for patients, staff and caregivers; regularly laundering bedsheets and patients' clothing; providing adequate and accessible toilets (including separate facilities for confirmed and suspected cases of COVID-19 infection); and segregating and safely disposing of health care waste. For details on these recommendations, please refer to Essential environmental health standards in health care.[14]

1. Hand hygiene practices

Hand hygiene is extremely important. Cleaning hands with soap and water or an alcohol-based hand rub should be performed according to the instructions known as "My 5 moments for hand hygiene".[15] If hands are not visibly dirty, the preferred method is to perform hand hygiene with an alcohol-based hand rub for 20–30 seconds using the appropriate technique.[16] When hands are visibly dirty, they should be washed with soap and water for 40–60 seconds using the appropriate technique.[17] Hand hygiene should be performed at all five moments, including before putting on PPE and after removing it, when changing gloves, after any contact with a patient with suspected or confirmed COVID-19 infection or their waste, after contact with any respiratory secretions, before eating, and after using the toilet.[18] If an alcohol-based hand rub and soap are not available, then using chlorinated water (0.05%) for handwashing is an option, but it is not ideal because frequent use may lead to dermatitis, which could increase the risk of infection and asthma and because prepared dilutions might be inaccurate.[19] However, if other options are not available or feasible, using chlorinated water for handwashing is an option.

Functional hand hygiene facilities should be present for all health care workers at all points of care and in areas where PPE is put on or taken off. In addition, functional hand hygiene facilities should be available for all patients, family members, and visitors, and should be available within 5 m of toilets, as well as in waiting and dining rooms and other public areas.

2. Sanitation and plumbing

People with suspected or confirmed COVID-19 disease should be provided with their own flush toilet or latrine that has a door that closes to separate it from the patient's room. Flush toilets should operate properly and have functioning drain traps. When possible, the toilet should be flushed with the lid down to prevent droplet splatter and aerosol clouds. If it is not possible to provide separate toilets, the toilet should be cleaned and disinfected at least twice daily by a trained cleaner wearing PPE (gown, gloves, boots, mask, and a face shield or goggles). Further, and consistent with existing guidance, staff and health care workers should have toilet facilities that are separate from those used by all patients.

WHO recommends the use of standard, well-maintained plumbing, such as sealed bathroom drains, and backflow valves on sprayers and faucets to prevent aerosolized faecal matter from entering the plumbing or ventilation system,[20] together with standard wastewater treatment.[21] Faulty plumbing and a poorly designed air ventilation system were implicated as contributing factors to the spread of the aerosolized SARS coronavirus in a high-rise apartment building in Hong Kong in 2003.[22] Similar concerns have been raised about the spread of the COVID-19 virus from faulty toilets in high-rise apartment buildings.[23] If health care facilities are connected to sewers, a risk assessment should be conducted to confirm that wastewater is contained within the system (that is, the system does not leak) before its arrival at a functioning treatment or disposal site, or both. Risks pertaining to the adequacy of the collection system or to treatment and disposal methods should be assessed following a safety planning approach,[24] with critical control points prioritized for mitigation.

For smaller health care facilities in low-resource settings, if space and local conditions allow, pit latrines may be the preferred option. Standard precautions should be taken to prevent contamination of the environment by excreta. These precautions include ensuring that at least 1.5 m exists between the bottom of the pit and the groundwater table (more space should be allowed in coarse sands, gravels, and fissured formations) and that the latrines are located at least 30 m horizontally from any groundwater source (including both shallow wells and boreholes).[21] If there is a high groundwater table or a lack of space to dig pits, excreta should be retained in impermeable storage containers and left for as long as feasible to allow for a reduction in virus levels before moving it off-site for additional treatment or safe disposal, or both. A two-tank system with parallel tanks would help facilitate inactivation by maximizing retention times, as one tank could be used until full, then allowed to sit while the next tank is being filled. Particular care should be taken to avoid splashing and the release of droplets while cleaning or emptying tanks.

3. Toilets and the handling of faeces

It is critical to conduct hand hygiene when there is suspected or direct contact with faeces (if hands are dirty, then soap and water are preferred to the use of an alcohol-based hand rub). If the patient is unable to use a latrine, excreta should be collected in either a diaper or a clean bedpan and immediately and carefully disposed of into a separate toilet or latrine used only by suspected or confirmed cases of COVID-19. In all health care settings, including those with suspected or confirmed COVID-19 cases, faeces must be treated as a biohazard and handled as little as possible. Anyone handling faeces should follow WHO contact and droplet precautions[18] and use PPE to prevent exposure, including long-sleeved gowns, gloves, boots, masks, and goggles or a face shield. If diapers are used, they should be disposed of as infectious waste as they would be in all situations. Workers should be properly trained in how to put on, use, and remove PPE so that these protective barriers are not breached.[25] If PPE is not available or the supply is limited, hand hygiene should be regularly practiced, and workers should keep at least 1 m distance from any suspected or confirmed cases.

If a bedpan is used, after disposing of excreta from it, the bedpan should be cleaned with a neutral detergent and water, disinfected with a 0.5% chlorine solution, and then rinsed with clean water; the rinse water should be disposed of in a drain or a toilet or latrine. Other effective disinfectants include commercially available quaternary ammonium compounds, such as cetylpyridinium chloride, used according to manufacturer's instructions, and peracetic or peroxyacetic acid at concentrations of 500–2000 mg/L.[26]

Chlorine is ineffective for disinfecting media containing large amounts of solid and dissolved organic matter. Therefore, there is limited benefit to adding chlorine solution to fresh excreta and it is possible that this may introduce risks associated with splashing.

4. Emptying latrines and holding tanks, and transporting excreta off-site.

There is no reason to empty latrines and holding tanks of excreta from suspected or confirmed COVID-19 cases unless they are at capacity. In general, the best practices for safely managing excreta should be followed. Latrines or holding tanks should be designed to meet patient demand, considering potential sudden increases in cases, and there should be a regular schedule for emptying them based on the wastewater volumes generated. PPE (long-sleeved gown, gloves, boots, masks, and goggles or a face shield) should be worn at all times when handling or transporting excreta offsite, and great care should be taken to avoid splashing. For crews, this includes pumping out tanks or unloading pumper trucks. After handling the waste and once there is no risk of further exposure, individuals should safely remove their PPE and perform hand hygiene before entering the transport vehicle. Soiled PPE should be put in a sealed bag for later safe laundering (see Cleaning practices). Where there is no off-site treatment, in-situ treatment can be done using lime. Such treatment involves using a 10% lime slurry added at 1-part lime slurry per 10 parts of waste.

5. Cleaning practices

Recommended cleaning and disinfection procedures for health care facilities should be followed consistently and correctly.[19] Laundry should be done and surfaces in all environments in which COVID-19 patients receive care (treatment units, community care centres) should be cleaned at least once a day and when a patient is discharged.[27] Many disinfectants are active against enveloped viruses, such as the COVID-19 virus, including commonly used hospital disinfectants. Currently, WHO recommends using:

- 70% ethyl alcohol to disinfect small areas between uses, such as reusable dedicated equipment (for example, thermometers);
- sodium hypochlorite at 0.5% (equivalent to 5000 ppm) for disinfecting surfaces.

All individuals dealing with soiled bedding, towels, and clothes from patients with COVID-19 infection should wear appropriate PPE before touching soiled items, including heavy duty gloves, a mask, eye protection (goggles or a face shield), a long-sleeved gown, an apron if the gown is not fluid resistant, and boots or closed shoes. They should perform hand hygiene after exposure to blood or body fluids and after removing PPE. Soiled linen should be placed in clearly labelled, leak-proof bags or containers, after carefully removing any solid excrement and putting it in a covered bucket to be disposed of in a toilet or latrine. Machine washing with warm water at 60–90°C (140–194°F) with laundry detergent is recommended. The laundry can then be dried according to routine procedures. If machine washing is not possible, linens can be soaked in hot water and soap in a large drum using a stick to stir and being careful to avoid splashing. The drum should then be emptied, and the linens soaked in 0.05% chlorine for approximately 30 minutes. Finally, the laundry should be rinsed with clean water and the linens allowed to dry fully in sunlight.

If excreta are on surfaces (such as linens or the floor), the excreta should be carefully removed with towels and immediately safely disposed of in a toilet or latrine. If the towels are single use, they should be treated as infectious waste; if they are reusable, they should be treated as soiled linens. The area should then be cleaned and disinfected (with, for example, 0.5% free chlorine solution), following published guidance on cleaning and disinfection procedures for spilled body fluids.[27]

6. Safely disposing of greywater or water from washing PPE, surfaces and floors.

Current WHO recommendations are to clean utility gloves or heavy duty, reusable plastic aprons with soap and water and then decontaminate them with 0.5% sodium hypochlorite solution after each use. Single-use gloves (nitrile or latex) and gowns should be discarded after each use and not reused; hand hygiene should be performed after PPE is removed. If greywater includes disinfectant used in prior cleaning, it does not need to be chlorinated or treated again. However, it is important that such water is disposed of in drains connected to a septic system or sewer or in a soakaway pit. If greywater is disposed of in a soakaway pit, the pit should be fenced off within the health facility grounds to prevent tampering and to avoid possible exposure in the case of overflow.

7. Safe management of health care waste

Best practices for safely managing health care waste should be followed, including assigning responsibility and sufficient human and material resources to dispose of such waste safely. There is no evidence that direct, unprotected human contact during the handling of health care waste has resulted in the transmission of the COVID-19 virus. All health care waste produced during the care of COVID-19 patients should be collected safely in designated containers and bags, treated, and then safely disposed of or treated, or both, preferably on-site. If waste is moved off-site, it is critical to understand where and how it will be treated and destroyed. All who handle health care waste should wear appropriate PPE (boots, apron, long-sleeved gown, thick gloves, mask, and goggles or a face shield) and perform hand hygiene after removing it. For more information refer to the WHO guidance, Safe management of wastes from health-care activities.[28]

Considerations for WASH practices in homes and communities.

Upholding best WASH practices in the home and community is also important for preventing the spread of COVID-19 and when caring for patients at home. Regular and correct hand hygiene is of particular importance.

1. Hand hygiene

Hand hygiene in non–health care settings is one of the most important measures that can prevent COVID 19 infection. In homes, schools and crowded public spaces – such as markets, places of worship, and train or bus stations – regular handwashing should occur before preparing food, before and after eating, after using the toilet or changing a child's diaper, and after touching animals. Functioning handwashing facilities with water and soap should be available within 5 m of toilets.

2. Treatment and handling requirements for excreta.

Best WASH practices, particularly handwashing with soap and clean water, should be strictly applied and maintained because these provide an important additional barrier to COVID-19 transmission and to the transmission of infectious diseases in general.[17] Consideration should be given to safely managing human excreta throughout the entire sanitation chain, starting with ensuring access to regularly cleaned, accessible, and functioning toilets or latrines and to the safe containment, conveyance, treatment, and eventual disposal of sewage.

When there are suspected or confirmed cases of COVID-19 in the home setting, immediate action must be taken to protect caregivers and other family members from the risk of contact with respiratory secretions and excreta that may contain the COVID-19 virus. Frequently touched surfaces throughout the patient's care area should be cleaned regularly, such as beside tables, bed frames and other bedroom furniture. Bathrooms should be cleaned and disinfected at least once a day. Regular household soap or detergent should be used for cleaning first and then, after rinsing, regular household disinfectant containing 0.5% sodium hypochlorite (that is, equivalent to 5000 ppm or 1-part household bleach with 5% sodium hypochlorite to 9 parts water) should be applied. PPE should be worn while cleaning, including mask, goggles, a fluid-resistant apron, and gloves,[29] and hand hygiene with an alcohol-based hand rub or soap and water should be performed after removing PPE.

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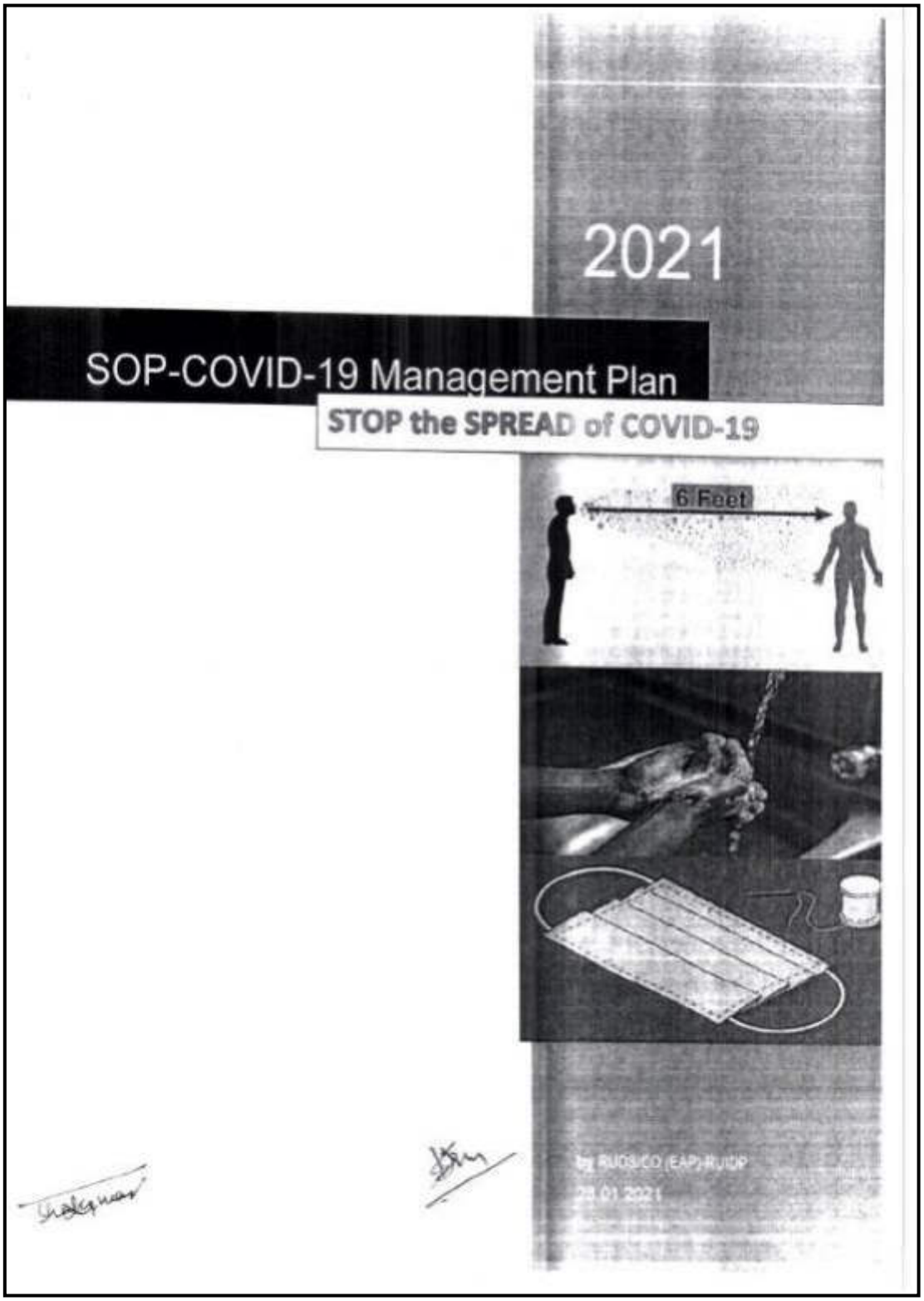
WHO continues to monitor the situation closely for any changes that may affect this interim guidance. Should any factors change, WHO will issue a further update. Otherwise, this interim guidance document will expire 2 years after the date of publication.

WHO reference number: WHO/2019-nCoV/IPC_WASH/2020.2

Appendix C-24: RUDSICO-EAP Guidelines for implementation of Prevention and Control Measures for COVID-19



Contents

Safe Operating Procedure (SOP) and COVID-19 Management Plan for Construction Works during COVID-19 Situation

I. INTRODUCTION

- Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus.
- Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness.
- The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes, so it's important that you also practice respiratory etiquette (for example, by coughing into a flexed elbow) and maintain social distancing
- At this time, there are no specific vaccines or treatments for COVID-19. However, there are many ongoing clinical trials evaluating potential treatments

II. PURPOSE

- This document[1] is intended to supplement formal EH&S policies, procedures and plans that the contractor has in place for its employees and staff working in RSTDSP projects. Hence, this document is not intended to replace any formalized procedures currently in place for the Contractor. Where this guideline does not meet or exceed the standards put forth by the Contractor, the Contractor shall abide by the most stringent procedure available.
- In addition to prevailing EH&S Plan in all projects, Safe Operating Procedures specific to COVID-19 are prepared by working contractors and being followed in all work sites.
- Existing EH&S Officer of contractor to be given additional responsibility of COVID-19 Officer[2] to implement and monitor the COVID-19 SOPs. The EH&S officer cum COVID-19 Officer[2] at the Contractor's worksite (appointed by Contractor and agreed by PIU) will submit a written weekly report to the Client's Representative (PIU Head). The EH&S Officer cum COVID-19 Officer shall certify that the Contractor and all subcontractors are in full compliance with these guidelines.
- The EH&S Officer cum COVID-19 officer should monitor all sites on daily basis.
- Any issue of non-compliance with these guidelines shall be a basis for the suspension of work. The Contractor will be required to submit a corrective action plan (on the next day or immediately as per the nature of issue) detailing each issue of non-conformance and a plan to rectify the issue(s). The Contractor will not be allowed to resume work until the plan is approved by the Client (PIU). Any additional issues of non-conformance may be subject to action against the Contractor's as health & safety/safeguard clauses of the contract.
- Construction sites operating during the Covid-19 pandemic need to ensure they are

[1] This document may be made available in the local language, and the salient features would be displayed through signages at the appropriate locations throughout work sites and stretches by the Contractor for wider dissemination and awareness

[2] The existing safeguards officer OR health & safety officer OR supervisor of the contractor can be designated as COVID-19 officer by undergoing the training available at
(a) https://www.who.int/emergencies/diseases/novel-coronavirus-2019/training/online-training
(b) https://openwho.org/courses/eprotect-acute-respiratory-infections
(c) https://openwho.org/courses/COVID-19-IPC-EN

protecting their workforce and minimizing the risk of spread of infection.

- This guidance is intended to introduce consistent measures on sites of all sizes in line with the Government's recommendations on social distancing.
- These are exceptional circumstances and the contractor and PIU must remain abreast of and comply with the latest Government advice on COVID-19 at all times.
- The health and safety requirements of any construction activity must also not be compromised at this time. If an activity cannot be undertaken safely due to a lack of suitably qualified personnel being available or social distancing being implemented, it should not take place.
- It is to be noted that emergency services/medical services are also under great pressure and may not be in a position to respond as quickly as usual.
- Sites should remind the workforce at every opportunity of the Worksite Procedures which are aimed at protecting them, their colleagues, their families and the nearby population.

If a worksite is not consistently implementing the measures in this document, it may be required to shut down.

III. COVID-19 TYPICAL SYMPTOMS

- Fever
- Cough
- Shortness of Breath
- Sore Throat

IV. PRINCIPLES OF WORKER PROTECTION

- Consistently practice social distancing
- Cover coughs and sneezes
- Maintain hand hygiene
- Clean surfaces frequently

V. MAXIMUM PRECAUTION FOR PERSONS/LABOURERS REPORTING TO WORK

- IF SICK, STAY HOME!
- IF SICK DURING WORK, GO HOME!
- IF SOMEONE SICK, SEND THEM HOME!

VI. PPEs AND SANITIZATION ARRANGEMENTS

Contractor to provide face masks (of the type approved by Government for use to protect persons from COVID-19) to all persons working in or visiting the worksite. At each worksite hand sanitizers/soap shall be kept and workers will be required to regularly sanitize/wash hands with soap. If any object is to be used by several workers, all workers shall be provided hand gloves. Full sanitization of worksite and work objects shall be done every day before start of works. This along with procedures set out in this document is for maximum precaution to protect all persons/labourers at all times.

VII. HEALTH CHECK UP AND THERMAL SCANNING

All persons at the worksite should have their temperature screened by COVID-19 officer with Infrared Thermometer (handheld non-contact).

Health checkup of all workers and staff shall be done by a medical practitioner on weekly basis. If any suspected COVID-19 infected person is found, he shall immediately reported to local authority/govt. recognized COVID-19 hospital. Thermal scanning shall be done of each worker and staff before entering to site and office and if any person has more than normal

temperature, he shall not be allowed to enter site/office. Such person shall be sent back to home/work camp and regular daily monitoring of his temperature shall be done and if temperature remains high he shall be reported to local authority/govt. recognized COVID-19 hospital for further treatment/quarantine.

VIII. SELF ATTESTATION BY PERSONS/LABOUR PRIOR TO WORK

Prior to starting a work (on daily basis), each labour /worker will self-attest to the supervisor:

- no signs of COVID-19 symptoms within the past 24 hours.
- No contact with an individual diagnosed with COVID-19. (contact means living with a positive person, being within 6 ft of positive person OR sharing things of positive person)
- Not undergone quarantine or isolation (in case of any labourer /worker who has been quarantined or isolated previously, the engagement shall be only after obtaining the requisite clearance)

The engagement of workers falling in the high-risk category such as workers over the age of 55 years, with underlying medical conditions or health issues, etc. should be done only after obtaining the requisite clearance from trained and registered medical practitioners.

The self-attestation would be verified in collaboration with trained and registered medical practitioners deployed at site through discussions with laborers /workers and/or preliminary checks such as temperature checks, etc. prior to their engagement at site.

In addition, the Contractor shall mandatorily follow all medical test requirements for the workers prior to their engagement and/or mobilization at site as per the guidelines issued by the Central and State government agencies and WHO from time to time.

Persons/Labourers showing COVID-19 symptoms or not providing self-attestation shall be directed to leave the work site and report to the Govt. recognized hospital/quarantine centre immediately. Labour not to return to the work site until cleared by Govt. recognized hospital /quarantine centre.

IX. GENERAL PRECAUTIONS TO BE FOLLOWED AT PERMANENT SITES/OFFICES

- No handshake, Only Namaste
- Non-essential physical work that requires close contact between workers should not be carried out
- Work requiring physical contact should not be carried out
- Plan all other work to minimise contact between workers
- Wash hands often (every 1-2 hrs or frequently as possible) with soap for at least 20 seconds
- Use hand sanitizer
- No person should enter the work site other than the authorized persons mentioned by supervisor during start of work
- All must implement social distancing[3] by maintaining a minimum distance of 6-feet from others[3] at all times to eliminate the potential of cross contamination.
- Avoid face to face meetings – critical situations requiring in-person discussion must follow social distance i.e., 6 ft from others.
- Conduct all meetings via conference calls, if possible. Do not convene meetings of

[3] Social distancing may not be practical for undertaking certain specific activities within the workplace. It is therefore important to review the work method statements for these types of activities to assess impact and how to find safe ways of doing in line with best available guidance

more than 10 people. Recommend use of cell phones, texting, web meeting sites and conference calls for project discussion

- All individual work group meetings/ talks should follow social distancing
- At each job briefing /toolbox talk, employees are asked if they are experiencing any symptoms, and are sent home if they are
- Each worksite should have displayed laminated COVID-19 safety guidelines and handwashing instructions (seen Annexure for display pictographs)
- All restroom /toilet facilities should be cleaned (min twice a day), and handwashing facility must be provided with soap, hand sanitizer and paper towels
- All surfaces should be regularly cleaned, including mobiles, tabletops /surfaces, door handles, laptops, records, etc.
- All common areas and meeting areas are to be regularly cleaned (min twice a day) and disinfected at least twice a day
- All persons to maintain their own water bottle, and should not be shared.
- To avoid external contamination, it is recommended everyone bring food from home
- Maintain Social Distancing separation during breaks and lunch.
- Cover coughing or sneezing with a tissue, then throw the tissue in the trash and wash hands, if no tissue is available then cough /sneeze into your upper sleeves or elbow. Do not cough or sneeze into your hands.
- Clean your hands after coughing or sneezing thoroughly by using soap and water (minimum for 20 seconds). If soap and water are not available, please use a hand sanitizer. The Contractor shall ensure adequate quantities of sanitizer and soap are made available at all locations including site offices, meeting rooms, corridors, washrooms /toilets, etc. as appropriate.
- Avoid touching eyes, nose, and mouth with your hands
- To avoid sharing germs, please clean up after Yourself. DO NOT make others responsible for moving, unpacking and packing up your personal belongings
- If you or a family member is feeling ill, stay home![4]
- Work schedules are adjusted to provide time for proper cleaning and disinfecting as required.

X. TEMPORARY WORK-SITE (PIPE LAYING SITES) PREVENTION PRACTICES

- At the start of each shift, confirm with all employees that they are healthy and inform all workers of reusable and disposable PPE.
- Outside person(s) should be strictly prohibited at worksite
- All construction workers will be required to wear cut-resistant gloves or the equivalent.
- Use of eye protection (reusable safety goggles/face shields) is recommended. The supply of eye protection equipment to the workers is considered as a standard part of PPE during construction works.
- In work conditions where required **social distancing is impracticable** to achieve, such employees shall be supplied with standard face mask, gloves, and eye protection.
- All employees shall drive to work site in a single occupant vehicle. Staff shall not ride together in the same vehicle
- When entering a machine or vehicle which you are not sure you were the last person to enter, make sure that you wipe down the interior and door handles with disinfectant (with 1% sodium hypochlorite solution) prior to entry. Adequate quantity of the disinfectant shall be provided by the Contractor at all such site-specific locations.
- Workers should maintain separation of 6 feet from each other.
- Multi person activities will be limited where feasible (two persons lifting activities)
- Gathering places on the site such as sheds and/or break areas will be eliminated, and

instead small break areas will be used with seating limited to ensure social distancing.

- Contact the cleaning person of the worksite and ensure proper COVID-19 sanitation processes. Increase cleaning/disinfection visits to at least 2 times a day. Cleaning person(s) to be provided with gloves, gown and face mask for each cycle of cleaning. The Contractor shall make available adequate supply of PPE and chemicals while the threat of COVID-19 continues.
- Clean all high contact surfaces a minimum of twice a day in order to minimize the spread of germs in areas that people touch frequently. This includes but is not limited to desks, laptops and vehicles
- All employees to maintaining good health by getting adequate sleep; eating a balanced, healthy diet, avoid alcohol; and consume plenty of fluids.
- Continuation of works in construction project with workers available on site and no workers to be brought in from outside
- The site offices shall have adequate ventilation. The air conditioning or ventilation systems installed at the site offices would have high-efficiency air filters to reduce the risk of infection. The frequency of air changes may be increased for areas where close personal proximity cannot be fully prevented such as control rooms, elevators, waiting rooms, etc.
- The Contractor shall carry out contactless temperature checks for the workers prior to site entrance, during working hours and after site works to identify persons showing signs of being unwell with the COVID-19 symptoms

XI. WASHING FACILITY

- All worksites should have access to toilet and hand washing facility.
- Providing hand cleaning facilities at entrances and exits. This should be soap and water wherever possible or hand sanitizer if water is not available
- Washing facility with hot water, and soap at fire hydrants or other water sources to be used for frequent handwashing for all onsite employees
- All onsite workers must help to maintain and keep stations clean
- If a worker notices soap or towels are running low or out, immediately notify supervisors. Proactively supervisor should make sure shortage situation never occurs.
- Garbage bins will be placed next to the hand wash facility for discarding of used tissues/towels with regular removal and disposal facility (end of each day)

XII. CLEANING PROCEDURES

Increase cleaning/disinfection visits to at least 2 times a day. Cleaning person(s) to be provided with gloves, gown and face mask for each cycle of cleaning.

Each worksite should have enhanced cleaning and disinfection procedures that are posted and shared including sheds, gates, equipment, vehicles, etc. and shall be posted at all entry points to the sites, and throughout the project site. These include common areas and high touch points like

- Taps and washing facilities
- Toilet flush and seats
- Door handles and push plates
- Handrails on staircases and corridors
- Lift and hoist controls
- Machinery and equipment controls
- Food preparation and eating surfaces
- Telephone equipment / mobiles
- Keyboards, photocopiers and other office equipment

Re-usable PPEs[4] should be thoroughly cleaned after use and not shared between workers

XIII. LABOUR CAMP

Contractor shall follow a zero-tolerance policy on wearing of masks.

Masks (homemade can be thought of) to be provided to all the persons/labourers for use at the camp site as well as at the worksite. Increase cleaning/disinfection visits to at least 2 times a day. Cleaning person(s) to be provided with disposable gloves, gown and face mask for each cycle of cleaning.

Toilet Facility

- Restrict the number of people using toilet facility at any one time e.g. appoint one welfare attendant among the labours.
- Wash hands before and after using the facilities
- Enhance the cleaning regimes for toilet facilities particularly door handles, locks and the toilet flush
- Portable toilets should be avoided wherever possible, but where in use these should be cleaned and emptied more frequently
- Provide suitable and sufficient rubbish bins for hand towels with regular removal and disposal.

Eating/snacks Arrangements

- Provide permanent (till society is safe from COVID-19) on-camp/off-camp cook/helpers can be implemented. Make sure that the "Guidelines for food handling, preparation and distribution during COVID-19" and it regular updates are being followed.
- Whilst there is a requirement for construction camps to provide a means of heating food and making hot water, these are exceptional circumstances and where it is not possible to introduce a means of keeping equipment clean between use, etc. must be removed from use.
- Contractor to arrange all daily need items and grocery at site itself and no worker is allowed to go to shops for daily need items.
- Dedicated eating areas should be identified on camp to reduce food waste and contamination
- Break times should be staggered to reduce congestion and contact at all times
- Hand cleaning facilities or hand sanitizer should be available at the entrance of any room where people eat and should be used by workers when entering and leaving the area
- Workers should sit 2 metres apart from each other whilst eating and avoid all contact
- Where catering is provided on camp, it should provide pre-prepared and wrapped food only
    - Payments should be taken by contactless options wherever possible
    - Crockery, eating utensils, cups etc. should be avoided wherever possible
- Drinking water should be provided with enhanced cleaning measures of the tap mechanism introduced
- Tables should be cleaned between each use
- All rubbish should be put straight in the bin and not left for someone else to clear up; only covered pedal operated bins should be used and the bins should be cleared and cleaned regularly, with strict adherence to safety protocols for disposal and hygiene maintenance (including proper PPE's such as gloves, mask and apron worn by the

[4] Advisory on use of Homemade Protective Cover for Face & Mouth by GOI

waste handler/cleaner and disposal at a designated place);
- All areas used for eating must be thoroughly cleaned at the end of each break and shift, including chairs, door handles, etc.

Changing Facilities, Bathrooms, Showers and Drying Areas

- Introduce staggered start and finish times to reduce congestion and contact at all times
- Introduce enhanced cleaning of all facilities throughout the day and at the end of each day
- Consider increasing the number or size of facilities available on camp if possible
- Based on the size of each facility, determine how many people can use it at any one time to maintain a distance of two metres
- Provide suitable and sufficient garbage bins in these areas with regular removal and disposal.
- Visitor log should be strictly maintained that the labour camp.

COVID-19 officer will ensure compliance with prevention issues at the labour camp(s).

XIV. UPDATES ON COVID-19

The Contractor shall be in touch with the Department of Health & Family Welfare and Labour Department to identify any potential worksite exposures relating to COVID-19, including:

- Strictly follow the guidelines issued by Ministry of Health and Family Welfare
- Other workers, vendors, inspectors, or visitors to the worksite with close contact to the individual
- Labour Camps / Work areas such as designated workstations or rooms /sheds
- Work tools and equipment
- Common areas such as break rooms, tables and sanitary facilities

Also refer the following websites from time to time for regular updates.

https://www.mohfw.gov.in/

This document can be updated from time to time based on the advisories or directions of the Govt.

XV. TRAINING

- PIU to ensure all workers get training on above requirements before start of any construction activity
- During construction period frequent visual and verbal reminders to workers can improve compliance with hand hygiene practices and thus reduce rates of infection. Handwashing posters should also be displayed at work site and labour camps

XVI. EMERGENCY CONTACT

- Provide emergency contact number(s) at work site and labour camp for reporting COVID-19 symptoms

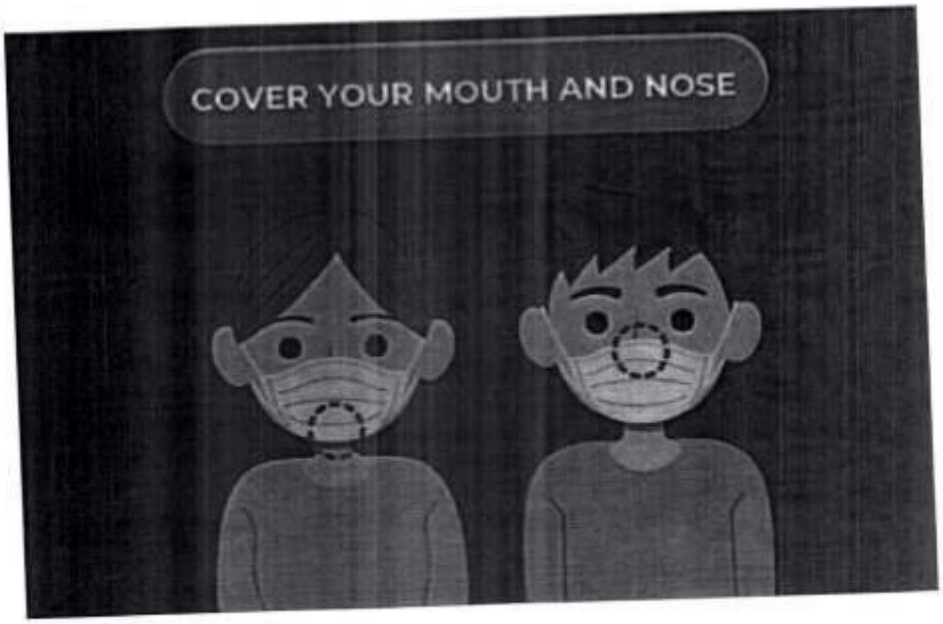
Ensure all staff and personal use the Aarogya Setu app, recommended by GOI for tracking COVID-19 patients.

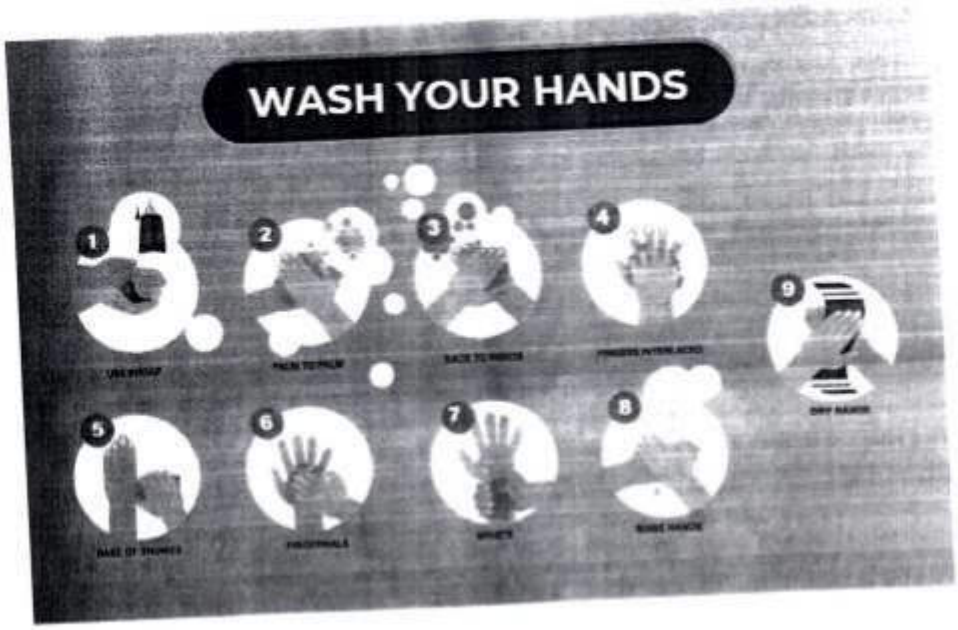
Team Leader
PMCBC, RSTDSP Jaipur

ESS, PMCBC

COVID-19 PRECAUTIONS

(To be displayed at sites)




WASH YOUR HANDS


AVOID TRAVELLING


CONSULT A
DOCTOR


#I STAY AT HOME
AND FIGHT CORONAVIRUS


DON'T TOUCH
YOUR FACE
DON'T
TOUCH
YOUR
FACE


NO SELF-TREATMENT

Appendix C-25: Management of Work Plan during Festivals and Melas

1.	**Planning Of Fair and Festival**	• The date and time should be fixed well in advance so that all requisite preparations can be made. It should be announced at least 60 days in advance. • Information shall be shared with local health authorities'/ health officers of all localities in which fair/festival is being organized. • Health officer shall inform higher officials concerned with the fair/festival
2.	**Notification of fairs and festivals**	• Notification (by govt. order or otherwise) should specify ➢ The area and duration of the fairs/ festivals ➢ The limits of the area where fairs/ festivals are to be organized should be well defined • Also, festival tax if any being levied by the govt. on vehicles, travellers, etc should be notified. The Govt. should also notify how much tax will be levied
3.	**EHS Arrangements**	• The site should be demarcated and preparation of the site be done. • Site should be cleaned and drained properly • Roads should be aligned properly • Water sprinkling should be done periodically to avoid dust nuisance. • Sufficient numbers of dustbin container should be placed (Wet & Dry) • Water sufficient in quality and quantity fit for drinking and cooking should be arranged. Also facilities for safe storage of water can be made. • To practically possible extent, accommodation to the pilgrims and visitors be made. • Adequate lighting arrangements be made. • Wholesome food should be made available at reasonable price and yet of necessary quantities. Foods prepared/ offered/ stored has to be properly supervised. • All the food preparation should be hygienic. • Refuse, rubbish, sewage should be collected, removed and disposed off safely. • Suitable latrines should be arranged and maintained • Infectious cases if any should be detected early and segregated. Preventive measures should be started. • Adequate medical staff, medical relief, hospital accommodation be provided. • Any other service deemed necessary can be arranged for. • Health officer be given adequate powers to seize private buildings, private water supply like wells, etc. Same should be informed to public to prevent protest. • There should be good approach to the road. • Sweepers in ratio of 1 per 1000 pilgrims be appointed. • Temporary hospital be set up for management of any infections. District health officer should stay at the site of fair and festival.
4.	**Promoting COVID appropriate Behaviour.**	• Avoiding physical contact is a responsible behaviour as it prevents the spread of COVID-19 disease and other viruses. • Physical distance Should be maintained minimum 6 feet

		• Avoid Touching Eyes, Nose and Mouth / Maintain respiratory hygiene / Wash hands frequently and thoroughly