

Initial Environmental Examination

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

Bundi Storm Water Drainage

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CURRENCY EQUIVALENTS

(As of 19th January 2024)

Currency unit	=	Indian rupee (₹)
₹ 1.00	=	\$ 0.012
\$1.00	=	₹ 83.11

ABBREVIATIONS

ADB	–	Asian Development Bank
BOCW	–	Building and other Construction Workers
CLC	–	City Level Committee
CPCB	–	Central Pollution Control Board
DPR	–	Detailed Project Report
EHS	–	Environmental Health and Safety
EIA	–	Environmental Impact Assessment
EMP	–	Environmental Management Plan
IEE	–	Initial Environmental Examination
IFC	–	International Finance Corporation
MOEFCC	–	Ministry of Environment, Forest and Climate Change
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
ULB	–	Urban Local Body
WHO	–	World Health Organization

WEIGHTS AND MEASURES

m ³	–	cubic meter
dB	–	decibels
°C	–	degree centigrade
dia	–	diameter
kg	–	kilogram
kl	–	kilolitre
km	–	kilometer
kmph	–	kilometer per hour
KLD	–	kilolitres per day
ha	–	hectare
HP	–	horsepower
LPCD	–	liters per capita per day
lps	–	liters per second
m	–	meter
mg	–	milligram
mm	–	millimetre
MCM	–	million cubic meter
MLD	–	million liters per day
km ²	–	square kilometer

NOTE

In this report, "\$" refers to United States dollars.

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CONTENTS

EXECUTIVE SUMMARY	i
I. INTRODUCTION	1
A. Rajasthan Secondary Town Development Section Project – Additional Financing	1
B. Purpose of Initial Environmental Examination Report	2
C. Scope of IEE	2
D. Report Structure	2
II DESCRIPTION OF PROJECT	3
A. Bundi Town	3
B. Existing Drainage System of Bundi	4
C. Proposed Drainage works in Bundi	5
D. Implementation Schedule	20
III. ANALYSIS OF ALTERNATIVES	20
IV. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORKS	21
A. ADB Safeguard Policy	21
B. National Laws	24
C. Environmental Regulatory Compliance	25
V. DESCRIPTION OF ENVIRONMENT	37
A. Physical Resources	37
B. Climatic Conditions	41
C. Ecological Resources	51
D. Economic Development.	55
E. Socio Cultural Resources	57
VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES	71
A. Introduction	71
B. Pre-construction Impacts	73
C. Construction Impacts	74
D. Operation and Maintenance Impacts	85
VII. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE	86
A. Overview	86
B. Public Consultation	86
C. Information Disclosure	88
VIII. RIEVANCE REDRESS MECHANISM	89
A. Project Specific Grievance Redress Mechanism	89
B. Grievance Redress Process	90
IX. ENVIRONMENTAL MANAGEMENT PLAN	93
A. Environmental Management Plan	93
B. Institutional Arrangements	121
C. Capacity Building and Development	128
D. Monitoring and Reporting	129
E. EMP Implementation Cost	130

X. CONCLUSION AND RECOMMENDATION	132
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APPENDICES

Appendix 1: REA Check list	134
Appendix 2 : List of ASI and State Protected Monuments in Bundi	139
Appendix 3: Compliance with Environmental Criteria for Subproject Selection	140
Appendix 4: City Level Committee (CLC) meeting and Stakeholder Consultation Minutes of Meeting with Stakeholders Consultations Conducted During Project Preparation	149
Appendix 5: Photographs of Proposed Component Locations	160
Appendix 6: Environmental Monitoring Plan - Ambient Air, Noise, Water and Soil	183
Appendix 7: Integrated Biodiversity Assessment Report (IBAT analysis) for Bundi	184
Appendix 8: Environmental Monitoring Report: Pre-construction Phase	205
Appendix 9: Induction cum Orientation Safety Training Programme for Contactors & Technical personals	250

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

LIST OF COMMON APPENDICES (PART B)

Appendix C-1: Drinking Water Standards
Appendix C-2: Ambient Air Quality Standards
Appendix C-3: Emission limits for New DG sets up to 800 KW
Appendix C-4: Stack Height Requirement of DG set
Appendix C-5: Vehicle Exhaust Emission Norms
Appendix C-6: Ambient Noise Quality Standards
Appendix C-7: Noise Limits for DG Set
Appendix C-8: Effluent Discharge Standards for Sewage Treatment Plant
Appendix C-9: Pages from Rajasthan State Sewerage and Wastewater Policy for reuse of treated effluent and sludge
Appendix C-10: Guidelines for Reuse of Treated Effluent and Sludge from STP for Beneficial Purposes
Appendix C-11: Guidelines for compensatory tree plantation in RUIDP works.
Appendix C-12: Salient Features of Laws applicable to Construction Works including Labor Laws
Appendix C-13: Sample Outline Spoil Management Plan
Appendix C-14: Sample Outline Traffic Management Plan
Appendix C-15: Sample Six Monthly Reporting Format
Appendix C-16: Sample Environmental Site Inspection Report
Appendix C-17: Sample Grievance Registration Form
Appendix C-18: Management Plan for Night works at Project Sites
Appendix C-19: Guidelines for Safety during Monsoon/Heavy rainfall
Appendix C-20: Sample ACM Management Plan
Appendix C-21: Guidelines for Workers Camps
Appendix C-22: Guidelines for Safety in Chlorine Usage

Appendix C-23: Guidelines for Prevention and Control of COVID-19

Appendix C-24: RUDSICO-EAP Guidelines for implementation of Prevention and Control Measures for COVID-19

Appendix C-25: Management of Work Plan during Festivals and Melas

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.

Bundi is one of the project towns, and improvement of storm water drainage system in Bundi is proposed under the RSTDSP-AF. Following are the proposed components:

Storm Water Drainage. (1) Upgradation of Drain-1 Jaipur bypass - Rani ji ki Baori - Lanka gate – ice factory to UIDSMT Nalla (2.693 km); (2) Upgradation and extension of Drain -2- Agarwal Dharamshala to highway nalla on Silor road (1.210 km); (3) Upgradation of Drain-3 - Khoja gate to ice factory (0.407 km); (4) Upgradation and extension of Drain-4 - Gurudwara Devpura to Nanak PuliyaTiraha (4.008 km) and (5) Upgradation and extension of Drain- 5 - Jait Sagar to Devpura (5.9 km).

Screening and Categorization assessment of potential impacts. Bundi Town storm water drainage 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. Per Government of India environmental impact assessment (EIA) Notification, 2006, subproject do not require environmental clearance.

Description of the Environment. Subproject components are in Bundi City 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. Nearest protected area is Ramgarh Vishdhari Wildlife Sanctuary, about 350 metres from proposed components i.e Jait Sagar Drain. There is one protected monument of national importance, Wall paintings of Hardoti School in the Palace - 300 m from starting point of Jait sagar drain and three protected monuments of local importance. None of the components or located in or close to monuments. There are also some old/heritage buildings in old town area of Bundi, which are not notified or protected, but are part of local heritage. No works are located within these, drainage rehabilitation works are proposed within the existing drains and extension works are within the ROW of the roads along which some of these buildings are located. About 60 number of trees of *Acacia nelotica* may be required to cut, which will be compensated with compensatory plantation.

Potential Environmental Impacts and Mitigation measures. In this updated 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 archaeological resources envisaged. Discharge of wastewater into open drains may deteriorate the drain water quality and receiving water bodies. Sewerage system is also being improved in the city in uncovered areas. Temporary measures suggested to avoid any disturbance / damage to old/heritage buildings during construction of drains.

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. All 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. Construction 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.

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 drainage 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 always kept on-site during the construction period. The EMP will be included in bids and contracts, and implementation shall be binding on contractors.

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 8 places along with proposed alignment with about 100 persons (90 male and 10 females) in the month of January and July 2022. A City Level Committee (CLC) was held and CLC has appreciated and approved the subproject. A town level consultation was conducted on 24.03.2023 at Collectorate Meeting Hall in Bundi Town, which was attended by Chairperson, Vice Chairman, and elected councillors of Bundi Municipal council, and officers of district administration and local bodies. The draft IEE was made available at public locations; and this updated IEE will also be disclosed to a wider audience via the ADB and RUDSICO websites.. Consultation process will continue during project implementation. A grievance redress mechanism (GRM) is 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 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 Bundi will be the major beneficiaries of this subproject, (i) Improved drainage system will result in the better environmental conditions of city, (ii) improved public health particularly reduction in vector borne and infectious diseases, (iii) people would spend less on healthcare and lose fewer working days due to illness, so their economic status, as well as their overall health should also improve.

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). Per primary survey a total of 60 trees were envisaged to be impacted due to implementation and the contractor is yet to complete the alignment survey of all the drains. The exact number of tree cutting required will be included in the next updated IEE. In case of tree cutting required, plantation will be done as per RUDSICO-EAP policy compensatory plantation in the ratio of 1:3 therefore total 180 tree plantations are being suggested for compensatory plantations. The IEE is now updated to reflect the approved Cast in Situ Section for Jait Saga drain, incorporating baseline environmental monitoring and stakeholder consultation held prior to start of work.

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. **Bundi Drainage Improvement Works.** This is one of the subprojects proposed under RSTDSP-AF. It will improve drainage system 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.

C. Scope of IEE

The subproject is proposed for implementation under the small works modality. The Draft IEE was based mainly on field reconnaissance surveys and secondary sources of information. The IEE is now being updated to reflect the approved Cast in Situ Section for Jait Sagar drain, inclusion of baseline environmental monitoring results and stakeholder consultation held prior to start of work. This IEE will be further updated if there are any changes in project scope, design and updates will supersede the earlier version.

D. Report Structure

6. This Report contains the following sections:

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

II. DESCRIPTION OF PROJECT

A. Bundi Town

7. Location, Area and Connectivity: Bundi is one of the towns of Rajasthan state with rustic setting that stands on the foothills of the Aravali Mountains and very famous for its historical Baories, forts and painting. The city is surrounded by rocky and barren hills on North-West side and fertile land on South-East side. The general topography of the town is undulating hilly terrain. The ground level varies from 310 m to 248 m and has an average elevation of 268m (879 feet).

B. Existing Conditions of the Town

Water Supply

8. Current source of water at Bundi town is 26 MLD surface form Kota Barrage and 5 MLD ground water. The town is benefited from Kota Barrage situated in the Kota city approximately at 30 kms from Bundi. Raw water from Kota Barrage is conveyed to existing WTP of capacity 26 MLD at Jakhmund and further supplied to Mangli H/W in the city & from there by pumping water is transferred to related various CWR to various overhead service reservoir & direct pumping to Zone. Total present production is approximately 26 MLD. The water transmission for raw water 9.9 kms and for treated water 70.14 kms of DI K-9 is already laid in town from WTP to Mangli Head works to various OHSRs located in the city. Dia of existing lines are from 100 mm to 600 mm.

9. The Water supply of Bundi Town is proposed to be further strengthened by construction of 8 MLD WTP at existing PHED Premises at Jhamkund along with strengthening of network piping in five zones of Bundi city in RUIDP Phase-IV.

Sewerage

10. The existing sewerage system of Bundi Town consists of the sewerage system established by RUIDP in phase-II under which 13 km sewer line, 950 nos. of house sewer connection and one STP of 8 MLD capacity executed. 5% network was covered under the project. In AMRUT Yojana, Works of sewer network in Zones 1, 2, 3, 4, 5, 6, 8 & 9 and two STPs of 0.5 MLD capacity each in zones 8 and 9 respectively are in progress under AMRUT Yojna. At present, approximately 120 km length of sewer line has been laid (out of total 135 km), and 11916 nos. households have taken house sewer connection (out of total 7480 nos. households have been connected till date).

11. Approximately 150 km sewer network is laid under existing sewerage project under execution in town. Thirteen kilometer has been laid by RUIDP (Phase-II) and 137 km is in the scope of AMRUT Scheme, of which 119.627 km has already been laid. There are no existing sewage pumping stations. Three STPs in the town viz 8 MLD STP based on SBR treatment process for Zones 1, 2, 3, 5, and 6 (Constructed under RUIDP, Phase-II and under operation) and another two STPs each 0.50 MLD under AMRUT for zone 8 & 9 proposed and under execution stage.

12. Sewerage Treatment Plant (WTP). One STP at Devpura; Near Ram Ganj Balaji; Bundi of 8 MLD is treating collected sewerage from town. Sequential Batch Reactor based STP is operational since 2015. Two STPs each 0.50 MLD under AMRUT are separate from the proposed subproject components in RUIDP Phase -IV and will cater only zone 8&9.

13. Almost all area under town is covered by sewerage/ ongoing sewerage works. Most of the residential buildings, commercial buildings, and educational institutions have on-site septic tanks. Indiscriminate solid waste disposal is prevalent in the town. There is no industrial area within the catchment area of these drains and sewer system is already established/ under construction by Bundi Municipality under RUIDP Phase -IV and AMRUT scheme. The connectivity to proposed drains will be restricted to storm water only and local body will ensure that no industrial wastewater and sewerage enter in to proposed drains.

C. Existing Drainage System of Bundi

14. The existing storm water drainage system in Bundi comprises of about 12 drains with Mangli River as the ultimate carrier. The city has a natural surface drainage system, and the entire city drains towards Mangali River which is a non-perennial river and flows from north-east to south - west of the city. Bundi city for the purpose of storm water drainage system, depends upon the natural surface topography and is divided into five master drainage areas. The Primary drains i.e., Jait Sagar Nallah are 100 ft. width with 5 ft. depths at various stretches. The following table depicts the list of major drains and their approximate length.

15. In proposed subproject 5 existing drains of Bundi town will be rehabilitated/rejuvenated. Some drain's length will be extended. Jait Sagar to Devpura drain will be extended up to 2.4 km. Gurudwara Devpura to Nanak Bridge circle drain will be extended up to 2.08 km. Agarwal Dharamshala to Highway Nallah drain, Silor road will be extended up to 0.61 km.

Table 1: Details of Existing Drains in Bundi (Highlighted drains are considered in current proposal)

S. No	Name of drain	length
1.	Bundi Bypass - Rani Ji Ki Bawadi - Lanka Gate - ICE Factory to UIDSSMT Nallah	2.693 Km
2.	Khoja Gate to Ice Factory	0.407 Km
3.	Circuit House to Gurudwara	0.700 Km
4.	Gurudwara Devpura to Nanak Puliya Tiraha	4.008 Km
5.	Gurudwara to Nanakpura Tiraha	2.000 Km
6.	Nanakpura Tiraha to Nanakpura Village	1.500 Km
7.	Jait Sagar to Devpura	5.900 Km
8.	Devpura to Nanakpura Village	2.500 Km
9.	Medical Colony to Highway Nallah	0.300 Km
10.	Agarwal Dharamshala to Highway Nallah on Silor Road	1.210 Km
11.	Highway Nallah to Agersen Dharamsala	0.600 Km
12.	Agersen Dharamshala to Ambedkar Circle	0.600 Km

Need of the Project

16. Bundi is the district headquarter and it is a historic town of Rajasthan having many tourist attractions. Bundi City is surrounded by hills and during the rains the water comes from surrounding areas and accumulates in Jait Sagar and Nawal Sagar ponds. Topography of Bundi is such that water comes from hills in its catchment area which sometimes overflows Shambhu Sagar, Jait Sagar and Nawal Sagar. Surplus water in Jait Sagar is released by opening its gates and discharged to Mangli River through Jait Sagar drain. The existing sections of Jait Sagar Drain are not adequate to carry the surplus discharge of Jait Sagar pond, which results in inundation in city areas. The other drains are also do not have adequate capacity to carry the storm water and are in poor condition. Due to this, many areas in city gets flooded during the rainy season, causing disruption of daily activities.

Objectives:

17. The objectives of the scheme are to:

- a) Improve infrastructure facilities and help create durable public assets and quality-oriented services in the city and to create healthy environment.
- b) To improve gap in existing infrastructure, such as Drainage system of the town to make city infrastructure complete, thus improving the city environment.
- c) Improvement of city drainage system and thus protecting city roads and improvement of quality of life.
- d) Promote planned integrated development of the city.
- e) The interventions will enhance the infrastructure in the town and will enhance tourism in Bundi district.

D. Proposed Drainage works in Bundi

18. Under this subproject Rejuvenation/ Upgradation and Extension of Five existing drains are proposed.

- Drain-1 - Jaipur bypass - Rani ji ki Baori - Lanka gate – ice factory to UIDSMT Nalla (2.693 Km) - drain starts from Bundi Bypass and ends up at FCI Godam at Chatrapura Road. Here it Joins the existing drain running along the Chatrapur road. This drain continues up to Mangli River. Section 0.60 m x 0.6 m to 2.00 m x 1.50 m, Length 2.693 Km. Upgradation of drain with box type drain in RCC.
- Drain-2 - Khoja gate to ice factory (0.407 Km)- drain starts from Khoja Gate Ganeshji and ends up at Ice Factory, where it joins the drain -1. Thus storm water from Drain-2 onwards Ice Factory (merger point of Drain 2 in Drain 1) is also carried by Drain -1 up to Chatrapura Road, where it joins Existing drain. Section 0.60 m x 0.60 m to 0.75 m x 0.75 m, Length 0.407 Km. Upgradation of existing drain with RCC box type drain.
- Drain-3 - Gurudwara Devpura to Nanak Puliya Tiraha (4.008 Km) - drain starts at Gurudwara Devpura and ends at Nanak Puliya Tiraha. This drain runs along with Bundi Road for its major length and turns Eastward along the New Mandi Road to Join Jetsagar Drain. Beyond this point Jetsagar is a Kachha (Unlined) drain and discharges storm water to Mangli River. Section 1.50 m x 1.50 m to 2.0 m x 2.0 m, Length 4.008 Km. Upgradation up to 2 km existing drain and extension for 2.008 km is proposed. Length of box type drain will be 3.2 km and 0.808 of stone pitching.
- Drain- 4 - Jait Sagar to Devpura (5.9 Km)- Drain starts immediate downstream (below the Gates of Jait Sagar Dam). It is a natural unlined drain and carries excess water of Jait Sagar to mangli River. This Drain-4 (Jait Sagar Drain) is joined by Drain 3 and storm water of both the drains is carried to Mangli River by Jait Sagar Drain. Section 5.0 m x 4.5 m to 6.5 m x 3.5 m, Length 5.900 Km traverses through the entire city. It passes through open

land (uninhabited) in the initial stretch (less than 1 Km), then through the colonies, and finally again through the open land (about 2.6 Km). The layout of the drain is mostly of cross-country nature and its ROW falls within the jurisdiction of the municipality. Upgradation up to 3.5 km existing drain and extension for 2.46 km is proposed. Length of in situ drain will be 3 km and 2.9 km will be stone pitching.

- Drain -5 - Agarwal Dharamshala to highway nalla on Silor road (1.210 Kms) - drain starts from Agarwal Dharamshala and ends at Highway Nalla along the Seelore Road. From Highway Nalla it joins a Kachha Drain (Unlined) and turns eastward to Join Existing drain on Chatrapura Road, which already carries water from Drain 1&2. Section 1.0 m x 1.0 m to 1.50 m x 1.50 m, Length 1.210 Km. Upgradation upto 0.6 km existing drain and extension for 0.61 km is proposed. Entire section of 1.210 km Length will be of box type drain.

19. Thus, final drainage of Drain-1, Drain-2 and Drain-5 is passes through existing unlined kachha drain. This drain runs along the Chatarpura Road up to Government Varist Upadhayay Sanskrit School, Chatarpurs and then it turns westward and is aligned in agricultural areas and finally drains water from Drain 1,2 and 5 to Mangli River. Google Map of proposed and existing drains up to Mangli river is provided in Figure 1.

20. . The total length of proposed works in Bundi Drainage is 14.218 km. Of the total length of drainage of 14.218 km., rejuvenation/upgradation in a length of 9.7 km is proposed in existing drains while extension in 5.09 km of drains is proposed. Details of existing drains is depicted in Table 1 and their condition is detailed in Table 2.

Table 2: Proposed Works of Drainage in Bundi

S. No	Name of the Drain	Existing length (In km)	Rejuvenation/ Upgradation (In km)	Extension proposed (In km)	Total length
1	Jaipur bypass – Rani Ji Ki Bawdi – Lanka Gate – Ice Factory – UIDSMT Nallah	3.2	2.640	0.0	2.693
2	Agarwal Dharamshala to Highway Nallah, Silor Road	0.6	0.600	0.61	1.210
3	Khoja Gate to Ice Factory	0.4	0.400	0.0	0.407
4	Gurudwara Devpura to Nanak Bridge circle	2.0	2.000	2.008	4.008
5	Jait Sagar to Devpura	3.5	3.500	2.46	5.900
	Total	9.7	9.14	5.078	14.218

Table 3: Details of Proposed Works of Drainage in Bundi based on drain type.

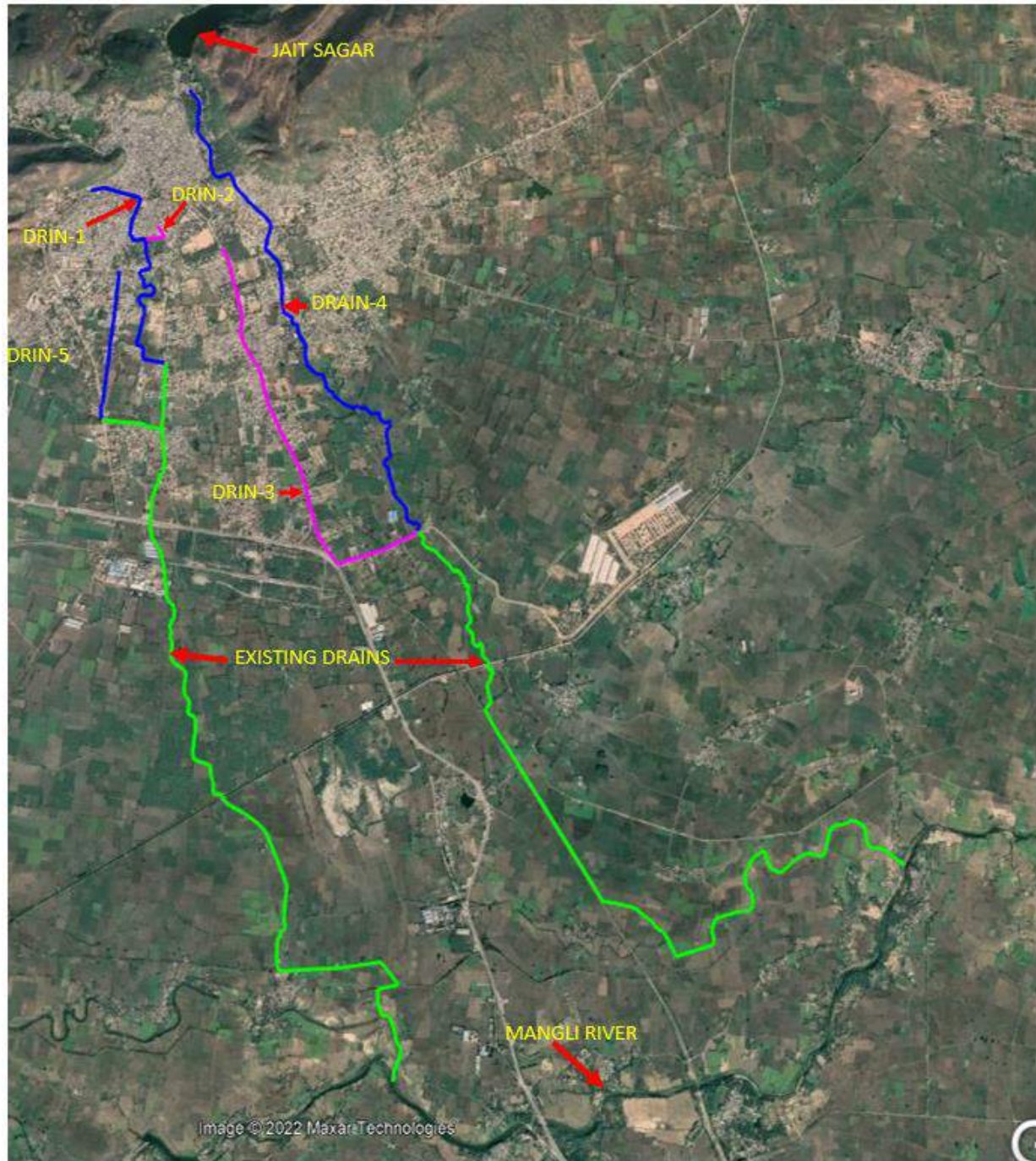
S.N.	Proposed works and location	Description of works
1)	Bundi bypass - Rani ji ki Baori - Lanka gate - ICE factory to UIDSMT Nalla Length: 2.693	• Construction of Box Drain in RCC from Bundi bypass - Rani ji ki Baori - Lanka gate - ICE factory to UIDSMT Nalla. • Box Section length- 1.440(A1)+1.250(A2) km. • A1-RCC Box ; A2-Cast in Situ Drain
2)	Khoja gate to ice factory Length: 0.407 km	• Construction of Box type drains • From Koja gate to Ice Factory • RCC Box Drain – Entire section
3)	Gurudwara Devpura to Nanak Puliya Tiraha. Length:4.008 km	• Construction of Box Drain and Stone Pitching Drain • Fom Gurudwara Devpura to Nanak Puliya Tiraha • Box Drain Length-3.2 km • Stone Pitching-0.808 Km
4)	Jait Sagar Nallah to Devpura Length:5.900 Km	• Construction of RCC Cast in Situ Drain & Stone Pitching Drain • From Dargah near jait Sagar to Mangli river • In situ Drain- 3.0 km • Stone Pitching-2.9 km
5)	Agarwal Dharamshala to highway nalla on Silor road Length:1.210 Km	• Construction of RCC Box Drain • Agarwal Dharamshala to Chattarpur drain • RCC Box Drain Length-1.210 km

Table 4: Drain wise Scope of Work Proposed under Bundi Drainage works and the proposed drain type.

Location	Length of Drain											Total Length of Drain (Mtr)	Remarks
	D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-7A	D-8	D-9	D-10		
Drain name/ Proposed size	0.6 x 0.6 m	0.75 x 0.75 m	1.0 x 1.0 m	1.0 x 1.25 m	1.25 x 1.25 m	1.5 x 1.5 m	2.0 x 2.0 m	2.0 x 2.0 m	2.0 x 1.50 m	5.0 x 4.5 m	6.5 x 3.5 m		
Jaipur Bypass to FCI godam along with Rani ji ki Bawadi	250	50	400	300	443	300			950			2693	RCC Box / RCC Cast in Situ
Khoja Gate Ganesh ji to Ice Factory		150	257									407	RCC Box
Gurudwara Devpura to Nanak Puliya Tiraha						1170	2000					3170	RCC Box
								838				838	Stone Pitching
Jait Sagar Nallah										3300		3300	RCC Cast in situ
											2600	2600	Stone Pitching
Silor Road (Agarwal Dharamshala to highway nalla on Silor road)			750		300	160						1210	RCC Box
Total	250	200	1407	300	743	1630	2000	838	950	3300	2600	14218	

21. Subproject is proposed for implementation under work contract, wherein which the successful bidder will validate design of the proposed drainage systems and components during Service Improvement Plan (SIP) preparation (within three months of contract award) as per updated /changed scope of works/project locations (if any) and revised IEE shall be submitted to ADB for approval and after approval from ADB shall be applicable to contractor throughout the project. Contractor will also conduct Environmental monitoring of baseline conditions of air, noise, water and soil and the same will be reflected in the revised IEE to be prepared during SIP Period. This IEE is revisable document and can be revised anytime during project implementation if there is any considerable change in scope of works, change in location of component, change in cost due to addition or subtraction of components etc. which can change the environmental impacts, and revised IEE shall supersede the earlier version of IEE and shall be contractually applicable to the contractor after approval from RUDSICO-EAP and ADB. Map of proposed drains in Bundi are showed in figure 1.

Figure 1: Map showing Existing (Green) and Proposed (Blue and Pink) Drains on Google Earth up to Mangli River.



- Drain -1 Jaipur Bypass to FCI godam along with Rani ji ki Bawadi
- Drain – 2 - Khoja Gate Ganesh ji to Ice Factory
- Drain – 3- Gurudwara Devpura to Nanak Puliya Tiraha
- Drain – 4 - Jait Sagar Nallah
- Drain – 5 - Silor Road (Agarwal Dharamshala to highway nalla on Silor road)

Figure 2: Proposed Drain and Mangli River in Bundi Town Survey of India Toposheet

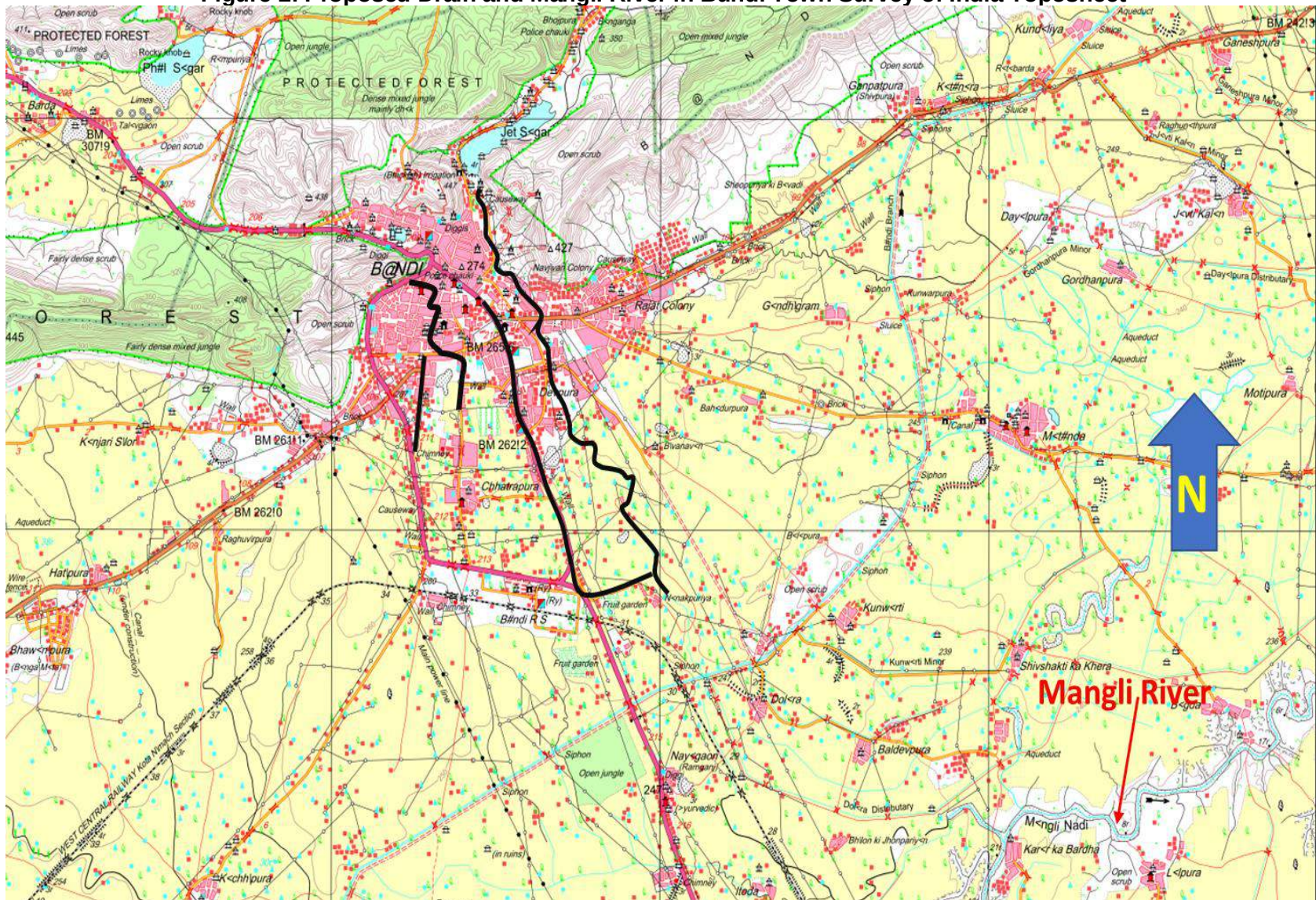


Figure 3: Location of Proposed Drainage (Jait Sagar Nallah to Devpura) in Google Earth Map

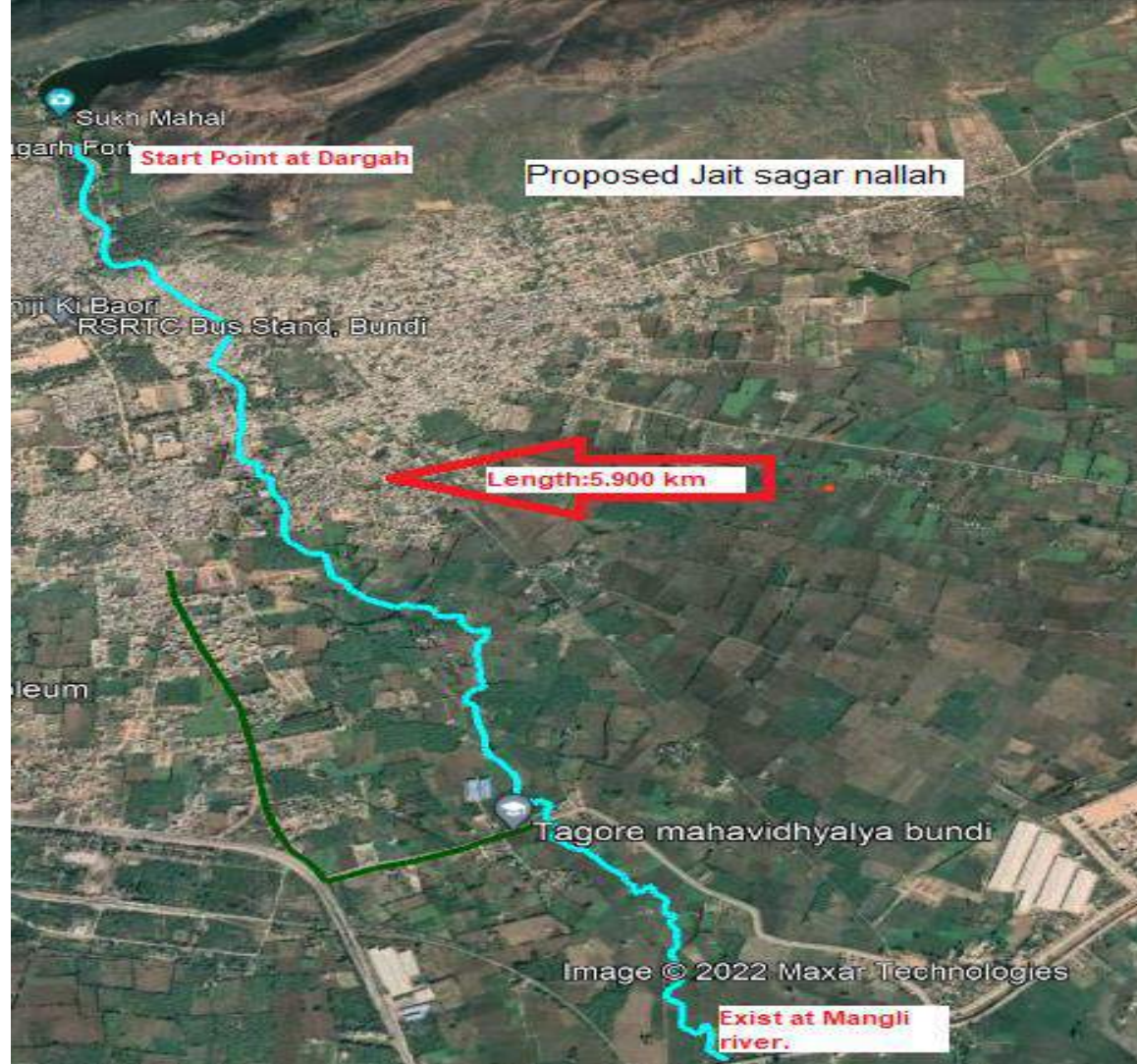


Figure 4: Location of Proposed Drainage (Bundi bypass - Rani ji ki Baori - Lanka gate - ICE factory to UIDSSMT Nalla) in Google Earth Map (Proposed alignment of Nalla in green line)



Figure 5: Location of Proposed Drainage (Khoja gate to ice factory) in Google Earth Map



Figure 6: Location of Proposed Drainage (Gurudwara Devpura to Nanak Puliya Tiraha.) in Google Earth Map

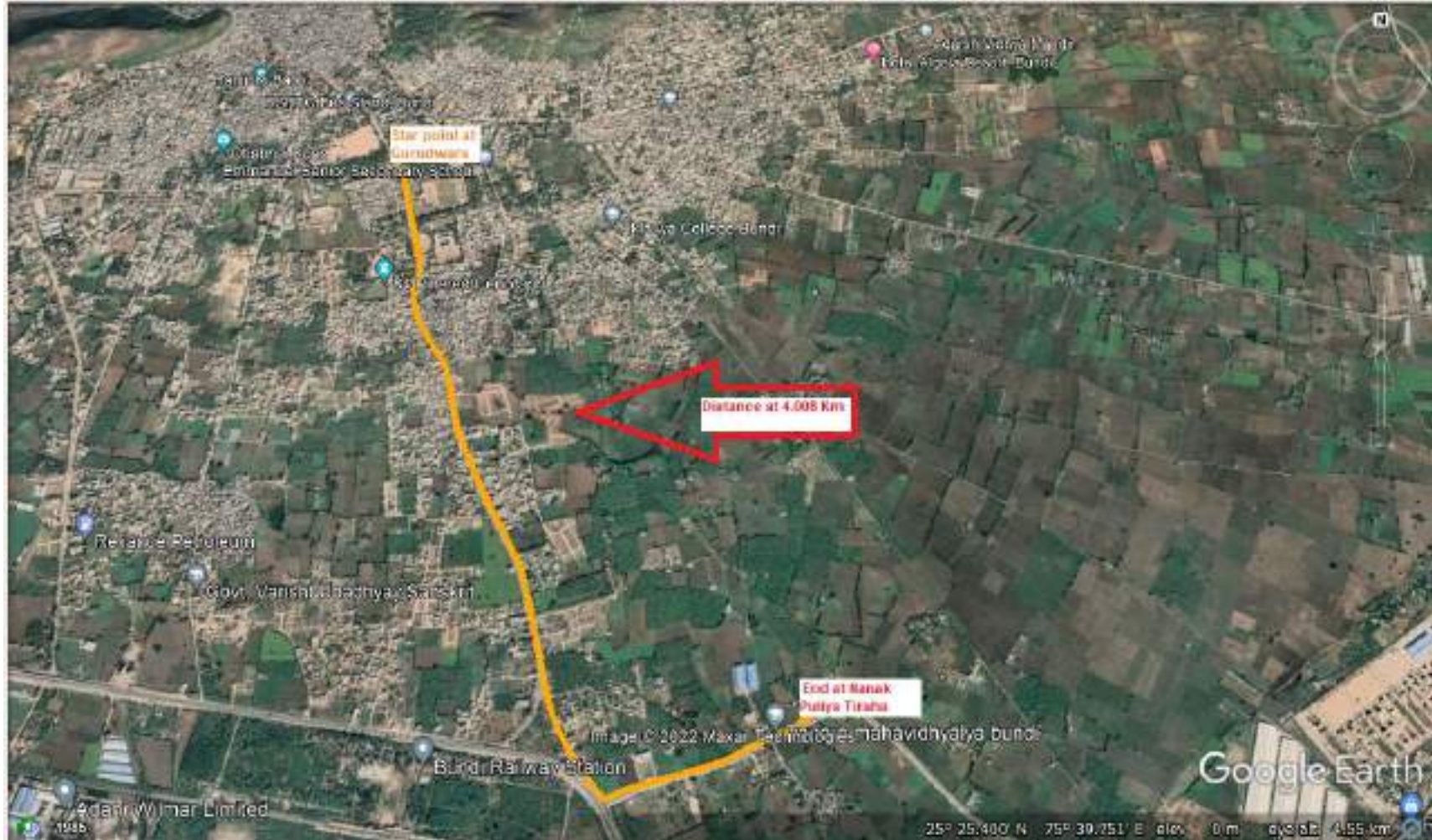


Figure 7: Location of Proposed Drainage (Agarwal Dharamshala to highway nalla on Silor road) in Google Earth Map



Figure 9: Typical Details of Box Drains & U drains

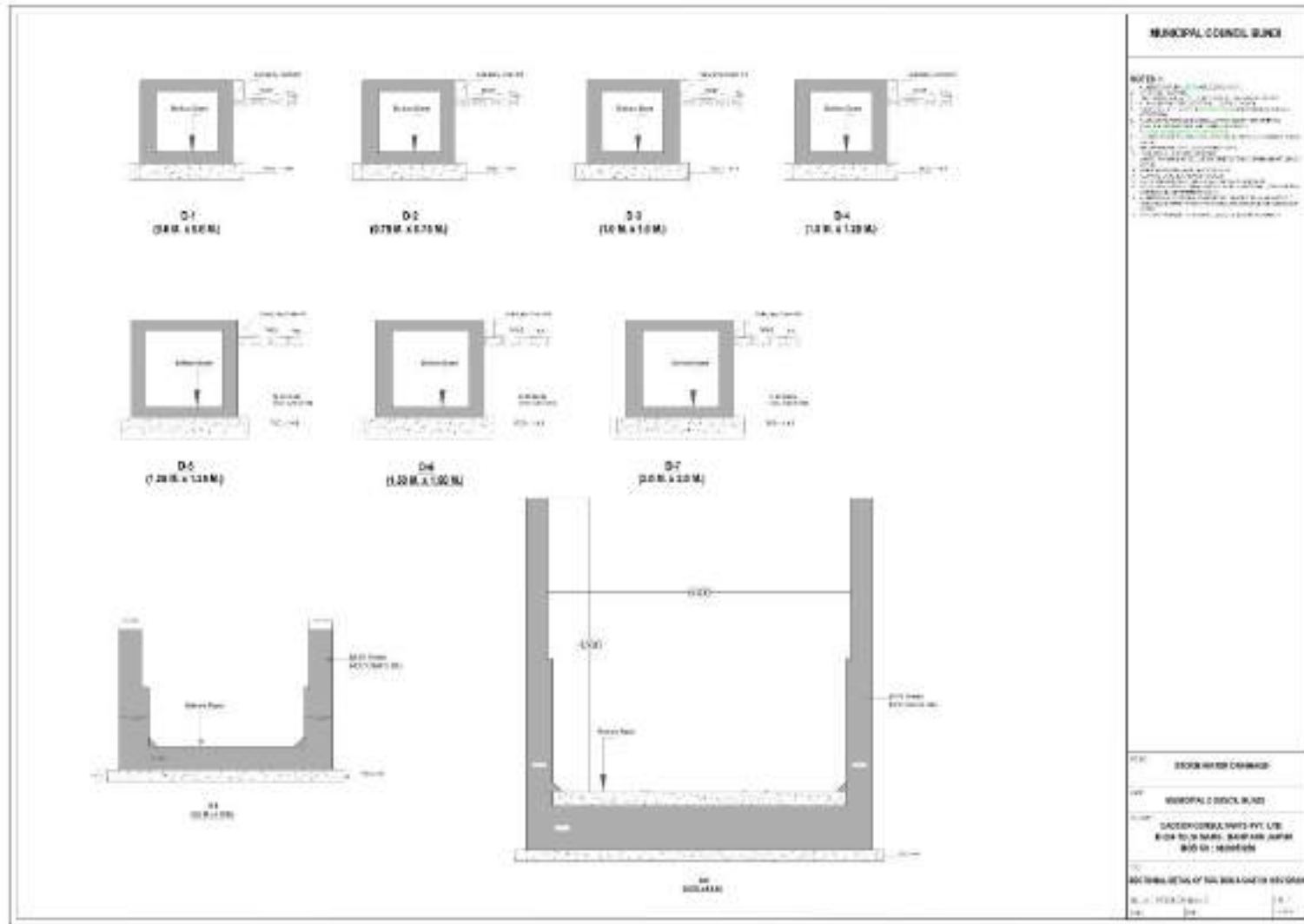
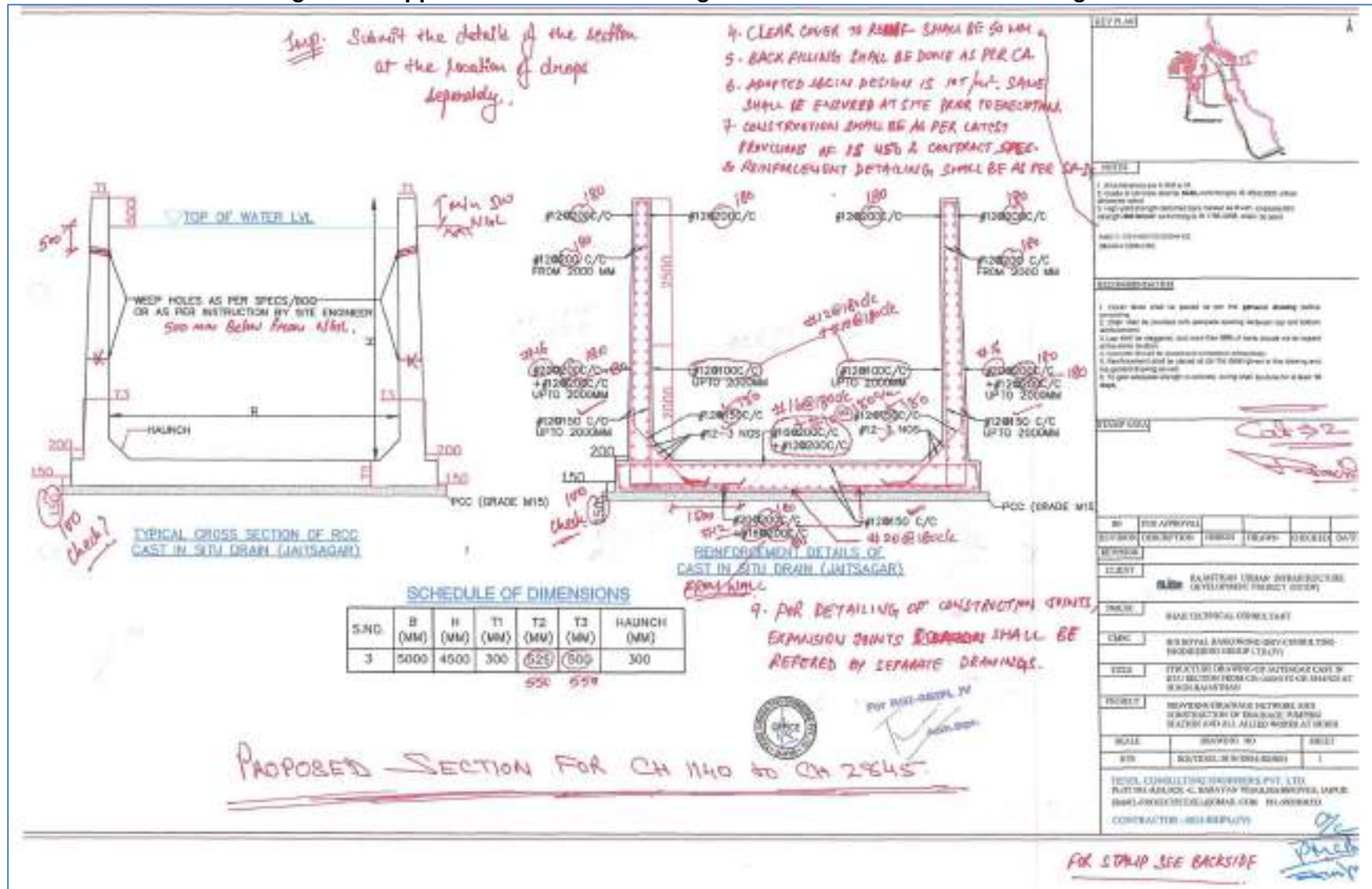


Figure 10: Approved Structural Drawing of Cast in Situ Section of Jait Sagar



Subproject Benefits

22. The subproject is primarily designed to improve environmental quality and living conditions of Bundi city through provision of drainage improvement works. The existing drain of Jait Sagar Nallah- It is main drain of the city which discharges water from lakes in city to Mangli River. This drain is also used for discharging city drainage and during monsoon its carrying capacity do not meet the demand of discharging city drainage as well as overflow waters from Jait Sagar Lake. Similarly, Khoja gate to ice factory drainage- is damaged and results into flooding of adjacent roads. Agarwal Dharamshala to highway nalla on Silor road drainage- It covers the main market area drainage and is in poor shape and Bundi bypass - Rani ji ki Baori - Lanka gate - ICE factory to UIDSMT Nalla- is a main drain which is not lined at present. Therefore the drainage of Budni requires rehabilitation to improve its adequacy to discharge the city drainage as well as overflowing water from Jait Sagar Lake, during monsoon to ultimate disposal in Mangli River . Implementation of the project will improve the drainage system of Bundi city, thereby liveability of the city.

E. Implementation Schedule

23. After the completion of preliminary designs, bids were invited in September 2022 for the subproject. After evaluation of Bids LOA was issued to successful bidder on 13 January 2023 and thereafter work is awarded. Project duration is 18 months including survey, investigation, inspection & construction. After completion of construction and commissioning, both the drainage works shall be handed over to Bundi Nagar Parishad, who will operate and maintain all five drains.

III. ANALYSIS OF ALTERNATIVES

24. The ADB SPS 2009 requires an analysis of project alternatives to determine the best method of achieving project objectives (which is safely collecting and disposing the water from five major drain, in Bundi 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.

25. The proposed drainage subproject component in Bundi includes strengthening of five major drains of Bundi city, for safe collection and disposal of water into Mangali river and other specific disposal point. Descriptions of various alternatives considered for proposed components are presented in the following Table 5.

Table 5: Analysis of Alternatives

1	Project Locations (alignment)
Description of alternatives	Bundi initially had a natural system of drainage and governed by the physiographic profile. Over the years, the population grew and utilizing the available open space more intensely, which has changed the natural drainage physiographic system. The drain system in the town is stabilized in market area and nearby market and is adequate to carry waste water and light storm. The existing drain network is analyzed and provides remedial measures for adequacy of drainage system. As per Bundi Master plan 2031, new inhabitant

1	Project Locations (alignment)
	areas of city are being developing and it was found existing drainage system does not cover newly developed area. These drains end up in surrounded irrigation land or in major drain (Nalah). The conditions of these drains are in very poor condition, and its discharge point does not properly connected to major drain (Nalah), that causes water logging at the downstream side with wastewater. The existing drains under observation are constructed with RCC and PCC or stone or brick masonry. Therefore, due to topography of the area the waste water and the storm water of the area either fall in nearby lakes or in the town, in the event of heavy storm the Jait Sagar overflows and Jait Sagar Drain do not cope with the situation emerging form overflow of water or intentional release of surplus water from the Jait Sagar Lake. This results in flooding in city areas. Similarly, other drains are also capable to discharge the waste water and are not adequate to discharge storm water as well as waste water.. The location at drain crossing the road RCC box (AA class) drain are consider for drain depth less than one meter and to carry the vehicular load as recommended by CHPEEO Manual. The alignment of major storm water drains under each drainage zones are identified based on the topography and sloping of Drainage area. To the maximum extent, the alignments are proposed along the existing road network only, to avoid any land acquisition. Location (alignment) of Jait Sagar Nala up to Mangli River- The entire city drains towards Mangli River which is a non-perennial river and flows from north-east to south-west of the city. As per the Topography of terrain and existing major drains and also keeping in view of their flow direction and ultimate disposal, The alignment of major storm water drains under each drainage zones are identified based on the topography and sloping of Drainage area. To the maximum extent, the alignments are proposed along the existing road network only to avoid any land acquisition. Therefore proposed alignments of drains are selected based on available ROW and government. lands, and no project alternative selected.

IV. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORKS

A. ADB Safeguard Policy

26. 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.

27. 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.

28. The environmental impacts of Bundi Drainage subproject have been identified and assessed as part of the planning and design process. An environmental assessment using ADB's REA checklist for Urban Development (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.

29. **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.

30. **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.

31. **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.

32. **Consultation and Participation.** ADB SPS, 2009 require borrower to conduct meaningful

consultation¹ 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.

33. 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.

34. 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.

35. 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.

36. Occupational Health and Safety. ADB SPS, 2009 requires the borrower² to ensure that workers³ 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 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.

37. 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

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.

impacts.

38. **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.

39. **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 Guidelines⁴ and Sector Specific [Water and Sanitation] Guidelines⁵). 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.

B. National Laws

40. 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.

41. **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.

42. **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

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>

(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.

43. **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.

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

45. **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 6.

C. Environmental Regulatory Compliance

46. **Table 6** presents a summary of environmental regulations and mandatory requirements applicable to Bundi Drainage subproject.

Table 6: 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 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.	RSTDSP should adhere to NEP principle of “enhancing and conservation of environmental resources and abatement of pollution”.	All phases of project
Rajasthan State Environment Policy, 2010	Follows the National Environment Policy, 2006 and core objectives and policies are: -Conserve and enhance	Project implementation should adhere to the policy aims of: conservation and enhancement of environmental resources,	All phases of project

Law	Description	Requirement	Relevance to Project Phase
And Rajasthan Environment Mission and Climate Change Agenda for Rajasthan (2010-14)	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	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, 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.	
EIA Notification, 2006	Projects indicated in the schedule of this notification require 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	-
Central Ground Water Authority (CGWA) 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	No new ground water well are proposed in subproject	Not applicable
Central Ground Water Authority under Department Of Water Resources, River Development And	extraction of ground water for drinking & Domestic use for Residential apartments/ Group Housing Societies/ Government water supply agencies in urban areas need to take NOC from	For grant of No Objection Certificate for ground water extraction, the project proponent has to furnish the details as per the guidelines issued by the CGWA in proper	Pre-construction/ construction and operation

Law	Description	Requirement	Relevance to Project Phase
Ganga Rejuvenation-Gazette Notification dtd. 24.09.2020	Central Ground Water Authority (CGWA)	format as available in CGWA website (https://cgwa-noc.gov.in/LandingPage/index.htm). No new ground water well are proposed in subproject	
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.	Proposed project components does not require consent under this Act	Not applicable
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	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	Construction and operation

Law	Description	Requirement	Relevance to Project Phase
	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.	(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	
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	-
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.	Not applicable, all subproject components are placed out the area of wildlife sanctuaries. Bundi district has 3 wildlife sanctuaries, the nearest one is Ramgarh Vishdhari Wildlife Sanctuary ⁶ is located 2 kilometres from Bundi on the Bundi-Nainwa road.	Not Applicable
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	Not applicable; none of the components of the subproject are located in forest.	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	There are rules / notifications that have been brought out under this Act, which are relevant to RSTDSP, and are listed below	Construction and operation

⁶ Recently Ramgarh Vishdhari Sanctuary is declared as tiger reserve and eco sensitive zone notification is in draft format. Before start of construction subproject's components distance from wildlife sanctuary required to be reverified

Law	Description	Requirement	Relevance to Project Phase
	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.,		
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; Appendix C-5 provides emission limits for vehicle exhaust and Appendix C-3 provides emission limits of DG sets and Appendix C-4 provided emission stack height requirements for diesel generators	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
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 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 bury the solid waste generated by him, on streets, open public spaces outside his premises or in the drain or water bodies.	Contractor to follow all the rules during construction works	Construction and operation
Construction and Demolition Waste Management Rules 2016	(i) Every waste generator shall segregate construction and demolition waste and deposit at collection centre or	Construction waste shall be collected at stockpile area for 8-10 days and will be sent to disposal site. Disposal site	Construction

Law	Description	Requirement	Relevance to Project Phase
	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 remodelling 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 notified by the concerned authorities;	shall be identified and allotted by Municipality 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	
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	Contractor to comply all the requirements of this Act during construction works.	Construction and operation

Law	Description	Requirement	Relevance to Project Phase
	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 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	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	There is no cause of impairment to historical/cultural monuments /areas and loss /damage to these sites and no cultural heritage site present near the proposed drains. Wall painting of Hardoti school in the palace is nearest ASI protected monument about 300 m from proposed Jait Sagar	Not Applicable

Law	Description	Requirement	Relevance to Project Phase
Validation) Act, 2010.	Archaeological Survey of India (ASI).	Drain in Northern direction in Bundi.	
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 prior permission of Department of Archaeology & Museums -Application under the Rules shall be submitted to Director, State Archaeological 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-.	In case of chance finds, the contractor/ PIU will be required to follow a protocol as defined in the Environmental Management Plan (EMP) Some of cultural assets in the form of religious places or historically important sites present in the project area are Shiv Temple, Inscription of Hamir and Raniji-ki-Baori. Raniji-ki-Baori having 50 m distance from nearest proposed drain. However, these cultural heritage sites may not come within the project influence area and utmost care will be provided to the nearby areas during constructional phase with adequate protection measures and by effectively implementing Environmental Management Plan.	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 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,	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 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	Construction

Law	Description	Requirement	Relevance to Project Phase
	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 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	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 equipment Chapter XVI- concrete works Chapter XVII- demolition works Chapter XVIII-Excavation and tunnelling 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
	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 up to the establishment and back, etc.,	• 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 labour laws including amendments issued from time to time applicable to establishments engaged in construction of civil works.	Construction and operation
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	Applicable to all construction works in the project All construction workers	Construction and operation

Law	Description	Requirement	Relevance to Project Phase
	employment is a scheduled employment. Construction of buildings, roads and runways are scheduled employment.	should be paid not less than the prescribed minimum wage	
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.	Not applicable; none of the components / alignment are in reserved or community forest areas.	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 countries to include wetland conservation in their national land use plans.	There are no Ramsar sites in or near Bundi. Not applicable to Bundi drainage subproject.	Not applicable
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 locations.	-
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	Not applicable in this project as no ODS are involved in construction works	Not applicable

Law	Description	Requirement	Relevance to Project Phase
	are divided in two groups Chlorofluorocarbons (CFCs) and Hydrochlorofluoro carbons (HCFCs)		
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 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.	Not applicable to this project as no migratory species of wild animals are reported in the project areas.	Not applicable

47. **Clearances / permissions to be obtained prior to start of construction.** Table 7 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 7: 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 from Bundi Nagar Parishad	Municipal Corporation/Bundi Nagar Parishad
2	Establishment of construction camps	Allotment and approval for specific land use	Contractor
3	Tree Cutting	State forest department/Revenue (Tehsildar)	PIU
4	Hot mix plants, Crushers, Batching plants and DG Set	Consent to establish and consent to operate under Air Act, 1981 from RSPCB	Contractor
5	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
6	Sand mining, quarries and borrow areas	Permission from District Collector/ State Department of Mines & Geology	Contractor
7	New quarries and borrow areas	Environmental clearance under EIA Notification 2006	Contractor
8	Use of vehicles and equipment	Pollution under control certificate (PUC) form RTO	Contractor
9	Temporary traffic diversion measures	Temporary traffic diversion measure including use of alternate road from District traffic police	Contractor
10	Use of Railways ROW for construction area/ crossing	Indian Railways	PIU
11	Use of highway ROW for construction area/ crossing	National Highway Authority of India-	PIU

48. PMU will be overall responsible for 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 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

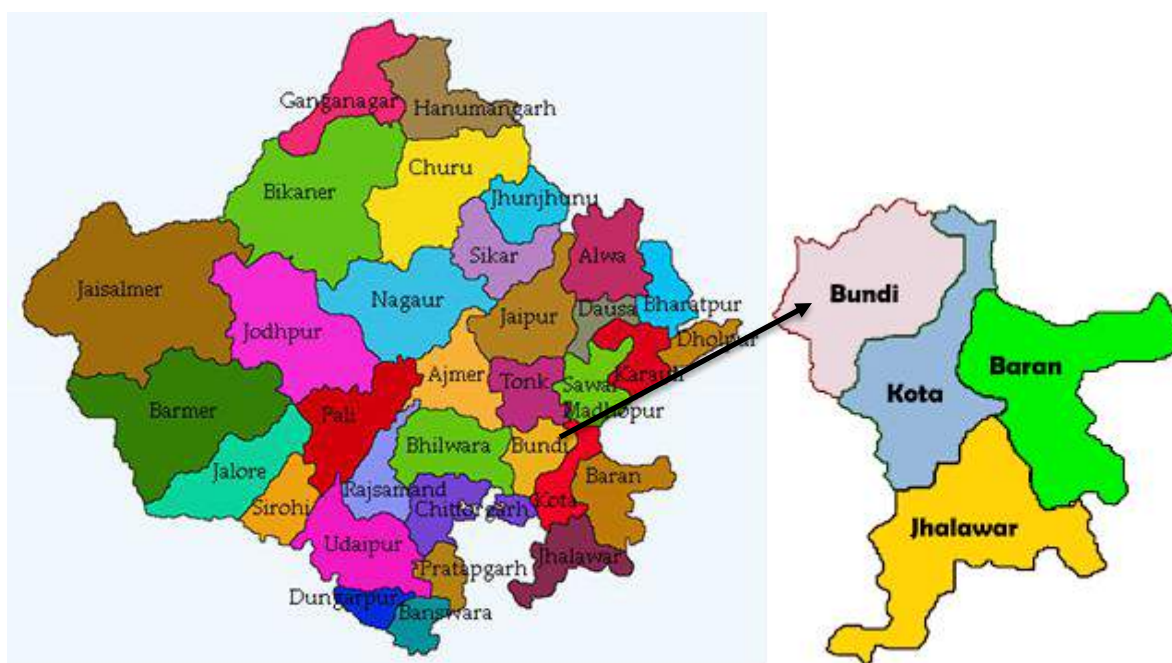
Location, Area & Connectivity

49. Bundi town is a district headquarter of Bundi district in state of Rajasthan. Bundi is situated in the south-east of Rajasthan. Bundi is a small city in the Hadoti region of Rajasthan, which is famous for its beautiful forts and palaces, and step-well reservoirs (local name: Baoris). Bundi District is situated at a distance of about 210 km from Jaipur, the capital of Rajasthan. The total area of the district is 5776 sq.km. This accounts for 1.68 % of the total area of Rajasthan. Bundi lies between 24°59'11" & 25°53'11" north latitude and 75°91'30" & 76°19'30" east longitudes.

50. It is bounded in the north by Tonk district, and in the south by Chittaurgarh district. The river Chambal forms the south-eastern boundaries and separates Bundi from Kota. A double line of hills (Vindhyan rocks) running through the district in the north-east and south-west directions. It is varying in height between 300 and 1,793 feet above sea level.

51. Bundi town is very famous for its Baoris (waterworks or stepwells), havelis (Rajasthani houses), temples and chhatris (elevated, dome-shaped pavilions) with carved pillars. The mural adorned palaces, the forts and the monuments tell tales about the glorious past of the town. A picturesque lake where the entire town and the palaces get reflected in the lake adds a stunning quality to the place. In the past, a tribe called Meena inhabited this region and Bundi derived its name from the tribe's chieftain's name - Bunda Meena. In the 12th century Bundi came under the dominion of the Chauhans and reached its highest glory in the medieval times. The glory of Bundi declined with the Mughal rule and later became an independent state. Hindi, Urdu, Rajasthani and Mewadi are all spoken in Bundi, as well as a number of local languages.

Figure 11: Location of Bundi Town in Rajasthan State Map



Topography, Soils and Geology

52. **Topography.** Topography of the district is characterized by flat to undulating terrain with small isolated mounds. It is divided in almost two equal parts by NE-SW trending Vindhyan Range. The general topographic gradient is from southwest to northeast in the southern part of the Range whereas to the northern part of the ridge the gradient is generally from west to east. High elevation hills are found southern part of the district around Budhpura and to the west of Bundi city. Chambal is the most prominent River in the district and there are some important tributaries like Dungari, Bhimlat, Mej, Bajian, Sugll and Kupal etc. The general topographic elevation in the district is between 250 m to 300 m above mean sea level. Elevation ranges from a minimum of 200 m above mean sea level in Keshorai Patan block in the south-eastern part of the district and maximum of 547.1 m above mean sea level In Talera block in southern part of the district

53. **Soils. Soil Quality:** The study of baseline soil quality has been conducted by the

construction contractor in 21 April 2023. Five soil samples. were collected from different sites which are Jait Sagar Nalla Near Arriwali Marriage Garden, Jait Sagar Nalla Near Meera Bagh Chowki, City Kotwali Police Thana, Bharat Petrol Pump (Devpura), Nainwa Road Magistrate Colony, Batching Plant Near Meera Road. The soil texture was clay loamy. Test report of soil sample result is given in Table 8. pH of soil samples is found within the range of 6.91 to 7.91. Available Nitrogen ranges from 302.54 kg/ha to 340.70 kg/ha while the phosphorus ranged between 15.76 kg/ha and 21.85 kg/ha.

Table 8: Laboratory test results of soil analysis.

Sr.No	Parameters	Unit of Measurement	Results					
			Jait Sagar Nalla Near Arriwali Marriage Garden	Jait Sagar Nalla Near Meera Bagh Chowki	City Kotwali Police Thana	Bharat Petrol Pump (Devpura)	Nainwa Road Magistrate Colony	Batching Plant Near Meera Road
1	pH	-	7.91	7.21	7.41	6.91	7.31	7.81
2	Available Nitrogen	kg/ha	302.54	315.59	316.22	328.48	316.36	340.70
3	Potassium as K	kg/ha	180.89	178.44	181.39	230.51	214.85	241.92
4	Electrical Conductivity	mS/cm	0.190	0.185	0.195	0.210	0.225	0.195
5	Calcium as Ca	mg/kg	18.28	9.13	27.41	27.41	45.69	18.27
6	Magnesium	mg/kg	3.88	6.65	4.99	7.76	6.10	7.21
7	Organic matter	%	0.31	0.28	0.45	0.37	0.38	0.37
8	Moisture content	%	1.68	1.43	1.45	1.74	1.38	1.54
9	Sodium as Na	mg/kg	110.66	90.96	91.98	94.91	80.93	96.91
10	Soil texture	-	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam	Clay Loam
11	Permeability	cm/Sec	0.0004	0.0005	0.0006	0.0007	0.0008	0.0005
12	Oil & Grease	mg/kg	BDL (< 0.5)	BDL (< 0.5)	BDL (< 0.5)	BDL (< 0.5)	BDL (< 0.5)	BDL (< 0.5)
13	Phosphate as P	kg/ha	15.76	20.11	19.10	20.23	17.53	21.85

BDL: Below Detection Limit

Sampling and testing done by: SKS Test Labs Pvt.Ltd.

54. Rock types exposed in the area belongs to the Bhilwara Supergroup (Archaean) and the Vindhyan Supergroup (Middle to Upper Proterozoic). The Bhadesar shale, slate, phyllite, quartzite and dolomitic limestone belonging to the Hindoli Group of the Bhilwara Supergroup are

exposed mainly near Hindoli and Khinia in the northern part. These are intruded by the Kaimur, the Rewa and Bhandar Groups, in decreasing order of antiquity. The Kaimur Group is represented by conglomerate and Akoda Mahadeo Sandstone. The Bhandar Group of rocks are best exposed between Bundi and Lakheri. The contact between the Hindolis and the Vindhya is marked by thrusts and faults.

55. Limestone is the most important mineral of the district. Deposits have been located near Bundi, Lakheri, and Satur. Limestone occurs sandwiched between the Ganurgarh Shale and the Lower Bhandar Sandstone. An indicated reserve of 850 million tons with 42.73 % calcium oxide (CaO) has been estimated. Glass sand occurrences are located near Barodia and Satur. Barytes near Umar occurs as small veins at the contact of limestone and schist. Minor occurrence of copper near Barodiya, marble at Umar and iron near Manak Chawk have also been reported.

56. **Seismology:** Many parts of the Indian subcontinent have historically high seismicity. Seven catastrophic earthquakes of magnitude greater than eight (Richter scale) have occurred in the western, northern and eastern parts of India and adjacent countries in the past 100 years. Approx. 59 % of the land area of India is liable to seismic hazard damage. In India, seismic zones are divided into four zones i.e., V, IV, III and II. As per the seismic zoning map of India, Bundi Town falls under the Zone II, which is the lowest earthquake risk zone in India. This zone is termed as “low damage risk zone” (Figure 12). Hence the risk of earthquake at the proposed sites is minimal and so the site is safe.

Figure 12: Earthquake Zone Map of Rajasthan



Demographic Profile

Table 9: Population growth Bundi, Rajasthan

Census	Population	Decadal Growth (Increase in Population per Decade)	% Increase in Population per Decade
1981	48027		
1991	65047	17020	35.44%
2001	88871	23824	36.63%
2011	103286	14415	16.22%

B. Climatic Conditions

57. The city has a dry climate except in the monsoon seasons. The winter season runs from mid-November to February and summer season runs from March to mid of June. The period from mid of June to September is the monsoon season followed by the months October to mid of November constitutes the post monsoon or the retreating monsoon. The average rainfall in the district is 850 mm. January is the coldest month with the average daily maximum temperature of 24.3°C and the average daily minimum temperature of 10.6°C. The project area has got a sub-tropical climate with moderate to hot temperature, ranges between 7 Degree C to 45 Degree C and relative humidity drops to about 20 % during March, April and May. July-August is most humid period averaging 70% to 80% humidity.

Surface Water

58. The main Bundi Rivers include Chambal and Kushal. The Chambal River dissects the two districts of Bundi and Kota and forms the southern boundary of the Bundi District. Chambal River is not only the Perennial River among the rivers of Bundi but among the rivers of Rajasthan. The length of the river is 165 km. Chambal River flows about 376 km in Rajasthan. The major town of Keshorai Patan lies on the bank of the Chambal River. Kushal River is also another small river in Bundi. There are 3 famous lake situated in surroundings of Bundi 1) Jait Sagar lake, 2) Kanak Sagar lake & 3) Nawal Sagar Lake

59. Jait Sagar lake is located at a distance of three kilometers from Bundi. Mountains surround the lake from all sides. The lake was built by Jaita Meena the ruler of Bundi in 14th century AD. Later got repaired by Gehlotni Jayvanti, the mother of Rao Raja Sarjan Singh. The beautiful fountain in the lake presents a beautiful sight to the spectators at night.

60. Kanak Sagar is a historic lake at the Dugari town of the Bundi district . It is famous for migrated birds around the year. Lake is about 67 km away from the main city of Bundi. Kanak Sagar has covered a total area of 44.85 Hectares.

61. This lake is famous for water animals and birds. The lake accords home to Pelicans, Black-tailed Godwit, Little Ringed Plover, Snail bird, Common Sweeper Bird, and Common Gull Bird. This lake is also famous for the Indian Screamer bird, Bar-Headed Goose.

62. **Surface Water Quality:** Water quality monitoring of Jait Sagar Lake was done on 21.04.2023 and tested in laboratory. Laboratory test report is given in **Table 10**.

63. **Table 10** shows the results of pre-construction surface water quality of Jait Sagar Lake and its comparison with Designated best use water quality criteria (CPCB standard), Updated on 23-Oct-2019.

Table 10: Laboratory test results of surface water

S.No	Parameters	Units	Results	Designated- Best - Use Class " E" Irrigation, Industrial Cooling, Controlled Water Quality Criteria, CPCB, MoEF7CC, GOI Waste Disposal	Designated –Best-Use Class-C Outdoor bathing (Organised) Water Quality Criteria, CPCB, MoEF7CC, GOI
			Jait Sagar Lake		
1	pH	-	7.67	6.5 to 8.5	6.5 to 8.5
2	Turbidity	NTU	3.39	-	
3	Total Dissolved solids	mg/l	208.0	-	
4	Chlorides as Cl	mg/l	32.30		
5	Sulphates as SO ₄	mg/l	30.43	-	
6	Total Suspended solids	mg/l	13.0	-	
7	Total Hardness as CaCO ₃	mg/l	164.16		
8	Calcium as Ca	mg/l	25.58		
9	Magnesium as Mg	mg/l	24.38		
10	Fluorides (as F)	mg/l	0.35		
11	Nitrate as NO ₃	mg/l	1.07		
12	Dissolved Oxygen(DO)	mg/l	6.3		5 mg/l or more
13	Biochemical Oxygen Demand (BOD) 3days @ 27°C	mg/l	40.50		3 mg/l or less
14	Chemical Oxygen Demand (COD)	mg/l	204.46		
15	Iron as Fe	mg/l	1.80		
16	Zinc as Zn	mg/l	BDL (<0.2)		
17	Copper as Cu	mg/l	BDL (<0.05)		
18	Manganese as Mn	mg/l	BDL (<0.05)		
19	Lead as Pb	mg/l	BDL (<0.05)		
20	Arsenic as As	mg/l	BDL (<0.005)		
21	Boron as B	mg/l	BDL (<0.2)	Max 2.0	
22	Cadmium as Cd	mg/l	BDL (<0.05)		
23	Selenium as Se	mg/l	BDL (<0.005)		
24	Mercury as Hg	mg/l	BDL (<0.001)		

S.No	Parameters	Units	Results	Designated- Best - Use Class “ E” Irrigation, Industrial Cooling, Controlled Water Quality Criteria, CPCB, MoEF7CC, GOI Waste Disposal	Designated –Best- Use Class-C Outdoor bathing (Organised) Water Quality Criteria, CPCB, MoEF7CC, GOI
			Jait Sagar Lake		
25	Sodium as Na	mg/l	10.89		
26	Potassium as K	mg/l	2.41		
27	Residual free Chlorine	mg/l	BDL (<2.0)		
28	Cyanide as CN	mg/l	BDL (<0.02)		
29	Aluminium as AL	mg/l	BDL (<0.03)		

BDL: Below Detection Limit

Sampling and testing done by: SKS Test Labs Pvt.Ltd.

^b Figures in parenthesis are detection limits.

Rivers in Bundi District

64. Chambal river's name is based on the ancient mythological river Charmawati. The river starts from Manpur near Mhow in Madhya Pradesh. It is covered a total area of 965 km and flows through a long narrow and steep gorge at Chaurasigarh. Where the Chambal River falls from 884.4 meters at its source to 505 meters. Again Chambal river enters the gorge from about 113 km and leaves it near the Kota district of Rajasthan.

65. The Chambal stream runs north for about 257 km and crossed the Jawahar Sagar sanctuary. Chambal river makes the boundary between Kota and Bundi districts of Rajasthan. Its total length is 376 km and depth 50 meters.

66. After crossing the Kota district, the Chambal river flows the boundary of Sawai Madhopur and Districts with the Madhya Pradesh state of India. Then, it finally enters in the Uttar Pradesh and engaged with the Yamuna River near Etawah. Chambal is the only river of Rajasthan which flows all over the year. It has beautiful sites and excellent resources for the development of cheap hydel power and irrigation facilities.

67. The Chambal River is famous for wildlife, Dams, endangered species, and also for history. It has two wildlife sanctuaries in Rajasthan Jawahar Sagar Wildlife Sanctuary in Kota and National Chambal Sanctuary in Dholpur. Red-crown turtles and Gangetic river Dolphins are endangered species only found in the Chambal River. And Indian Skimmers are only seen around Chambal River between Kota to Dholpur District. Chambal River has a total of 4 dams and all are in Rajasthan like Gandhi Sagar Dam, Jawahar Sagar Dam, Rana Pratap Sagar Dam, and Kota Barrage.

68. **Kota Barrage** is the fourth construction in the Chambal Valley Project over River Chambal, perineal river of Rajasthan. It was built to store water, release by the three upstream dams of the Chambal Valley project i.e. Gandhi Sagar Dam, Jawahar Sagar Dam and Rana Pratap Sagar Dam, and then channelize it to the dry areas of Rajasthan and Madhya Pradesh for irrigation purposes via canals. At present, it helps in agriculture in around 20,000 acres of land.

The 19-gate long barrage forms a bridge over River Chambal at Kota.

69. The Kota Barrage has its roots in scarcity and necessity of water distribution. It was in the 1950s and water was being harnessed at the Gandhi Sagar Dam, Jawahar Sagar Dam and Rana Pratap Sagar Dam - the three dams of Chambal River of Rajasthan, for hydroelectricity. However, the authorities realised that this water was not getting enough channelization and that agriculture in parts of both Rajasthan and Madhya Pradesh was suffering because of water scarcity. That is when a barrage was set up in Kota to hold huge amounts of water and further regulating and diverting them to the areas in need of water via canals.

70. After the completion of construction in 1960, the Kota Barrage started discharging water to both the states. According to an agreement, 50% water of Kota Barrage goes to Madhya Pradesh. At present, almost 20,000 acres of land are being benefitted by water irrigated by Kota Barrage, of which 11,300 acres are in Madhya Pradesh.

71. Kota Barrage stretches for a catchment area of 27,332 sq. Km in total. The primary support of the barrage is the Jawahar Sagar dam which holds 99 million cubic metres. The concrete spillway leads to a 188 cubic metres discharge capacity canal on the right and a 42 cubic metres one on the left. Like a typical barrage, it obviously serves as a bridge over River Chambal between the two sides. The barrage operates through 19 gates to control the flow of water and regulate it accordingly.

Mangli River:

72. Mangli river originates in Bundi District itself and is a tributary to Mej River, which in turn is a left bank tributary of Chambal River and joins Chambal River in Kota District. Thus, the Mej river Catchment extends over Bundi District while two other districts also form its catchment and these are Bhilwara District and Tonk District. Famous Bhimtal waterfall is also situated in Mangli river, which is upstream to Bundi city.

73. Surface water quality monitoring results show that all physical and chemical parameters fall within the permissible limit of Water quality for Indian Standards as well as WHO's prescribed limits, except for turbidity which is higher than acceptable limits.

Table 11: Surface Water Quality of Kota barrage (Source: PHED, Bundi on dated 19.08.2019)

National Standards for Drinking Water			WHO Guidelines for Drinking-Water Quality, 4 th Edition, 2011 ^b	Sampling sites									
Parameter	Unit	Max. Concentration Limits		Raw water		Treated water							
				Kota barrage		CF Water	Inlet Chamber No. 1	Inlet Chamber No. 2	Inlet Chamber No. 4	CWR NR WTP	CWR NR Pump House	CWR At Mangli	
Date of Sample				30.07.2019	03.12.20	19.08.19	19.08.19	19.08.19	19.08.19	19.08.19	19.08.19	19.08.19	
Turbidity	NTU	1 (5)	-	5.65	2.40	9.22	1.00	1.70	2.92	7.18	5.56	6.98	
pH		6.5 – 8.5	none	7.23	7.73	6.04	---	---	---	7.43	6.74	7.21	
TDS	mg/l	500 (2,000)	-	208	182								
Chloride	mg/l	250 (1,000)	none established	30	30	---	---	---	---		---	---	
Nitrate	mg/l	45	50	7	1	---	---	---	---	---	---	---	
Total Alkalinity (as CaCO ₃)	Mg/l	200 (600)		90	100								
Total Hardness	mg/l	200 (600)	-	100	96	---	---	---	---		---	---	
Residual Chlorine	mg/l	0.2	5		---	2.0	1.5	1.5	1.5	5.0	5.0	---	
Fluoride	mg/l	1 (1.5)	1.5	0.249	0.244								

Bureau of India Standard 10500: 2012.

- Health-based guideline values.
- Figures in parenthesis are maximum limits allowed in the absence of alternate source

Groundwater

74. Ground water occurs under water table conditions both in unconsolidated and consolidated formations. Its occurrence is controlled by topography, physiography and structural features of the geological formations. The movement of ground water in hard rock areas is governed by size, openness, interconnection and continuity of structurally weak planes while in unconsolidated rocks, ground water movement takes place through pore spaces between grains. The district is characterised by five types of soils given below (a). Lithosol and regosols of hills, (b), Yellowish – brown soils of foothills, (c). Recent alluvium (d), Brown soils-saline phase and (e) Black soils.

75. Geologically the district consists of diverse rock types belonging to oldest Archaean metamorphic of Bhilwara supergroup in the northern part and upper Proterozoic sedimentary of Vindhyan supergroup in the southern part. Quaternary alluvium is observed along main river courses and in shallow depressions in the south-western belt of the district. Depth to water level varies widely before monsoon, depending upon topography, drainage, bed rock, geology etc. Depth to water level ranges from 9mbgl (Rajgarh block) to 81.20mbgl (Behror block) in Bundi District. In Budi area the depth to water level is between 5 to 10 m during pre-monsoon while two to five meter during post monsoon.

76. **Groundwater Utilization.** Central Ground Water Board and Ground Water Department, Government of Rajasthan have jointly estimated the ground water resources of Bundi District based on GEC-97 methodology. Net annual ground water availability in the district has been estimated as 349.3267mcm. Annual ground water draft for all uses in the district has been assessed to be 331.9884 mcm with overall stage of ground water development at 95.04%.

77. **Groundwater Quality.** Groundwater quality of tube wells in Bundi is presented in Table 12. Groundwater is alkaline in nature with pH ranging from 7.02 to 7.03, and within the acceptable range of drinking water quality. Most of the tested parameters are well within the desirable limits of drinking water standards (IS 10500-2012) and WHO guidelines for drinking water inducing the Fluoride content. However, The concentration of Nitrate found exceeding the permissible limits in Jain temple area and is recorded as high as 135 mg/l. Total hardness and Total Dissolved Solids (TDS) exceeds the desired levels but is below the maximum permissible limits set under national standards for drinking water. well within permissible limits. Tube well water sample taken near Jain Mandir at Main Road, Bundi town.

Table 12: Ground Water Quality of Bundi (Source: PHED, Bundi on dated 10.01.2022)

Date of Sample			07.01.2022		07.01.2022
Source			Tube well (TW)		
Village/Town			Bundi		
National Standards for Drinking Water			WHO Guidelines for Drinking-Water Quality, 4 th Edition, 2011 ^b	Location of Source	
Parameter	Unit	Max. Concentration Limits		Jain Mandir Near Main road	Near Bawri, Dewpura, Almana Bhatti Bundi
Turbidity	NTU	1 (5)	-	-----	----
pH		6.5 – 8.5	none	7.02	7.03
Total Alkalinity				430	400
Colour	Hazen units	5 (15)	none	---	---

Date of Sample			07.01.2022		07.01.2022
Source			Tube well (TW)		
Village/Town			Bundi		
National Standards for Drinking Water			WHO	Location of Source	
Parameter	Unit	Max. Concentration Limits	Guidelines for Drinking-Water Quality, 4 th Edition, 2011 ^b	Jain Mandir Near Main road	Near Bawri, Dewpura, Alman Bhatti Bundi
Taste and Odor		Agreeable	-	---	---
TDS	mg/l	500 (2,000)	-	1182	663
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	0.810	0.621
Lead	mg/l	0.01	0.01	---	---
Ammonia	mg/l	0.5	none established	---	---
Chloride	mg/l	250 (1,000)	none established	200	50
Sulphate	mg/l	200 (400)	none	---	---
Nitrate	mg/l	45	50	135	23
Copper	mg/l	0.05 (1.5)	2	---	---
Total Hardness as (CaCo ₃)	mg/l	200 (600)	-	550	410
Calcium	mg/l	75 (200)	-	---	---
Zinc	mg/l	5 (15)	none established	---	---
Mercury	mg/l	0.001	0.006	---	---
Aluminium	mg/l	0.1 (0.3)	none established	---	---
Residual Chlorine	mg/l	0.2	5	---	---
E-coli	MPN/100 ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	---	---
Total Coliform	MPN/100 ml			---	---

78. **Ground Water Quality:** Ground water sampling was done on 24.04.2023 and tested in laboratory. Laboratory test report is given in **Table 13**.

79. Table 13 shows the results of pre-construction ground water quality in Bundi and its comparison with WHO and Indian Standards for drinking water. Ground water quality results shows high chloride in groundwater near Meera Road high total hardness and dissolved solids, which is in higher than acceptable limits but within permissible limits for Indian drinking water standards. In two samples, namely Bharat Petrol Pump (Devpura) and Career Word Sr Sec School Nainwa Road total hardness exceeds the maximum concentrations of permissible limit also.

Table 13: Laboratory Test Results of Ground Water Quality in Bundi

[illegible]

S.No	Parameters	Units	Results						Prescribed Limits	
			Jait Sagar Nalla Near Arriwali Marriage Garden	Jait Sagar Nalla Near Meera Bagh Chowki	City Kotwali Police Thana	Bharat Petrol Pump (Devpura)	Career Word Sr Sec School Nainwa Road	Batching Plant Near Meera Road	WHO guidelines for drinking water quality, 4 th edition, 2011 ^a	Maximum concentration limits (Bureau of India Standard 10500: 2012) ^b
15	Mercury as Hg	mg/l	BDL (<0.001)	BDL (<0.001)	BDL (<0.001)	BDL (<0.001)	BDL (<0.001)	BDL (<0.001)	0.006	0.001
16	Zinc as Zn	mg/l	BDL (<0.2)	BDL (<0.2)	BDL (<0.2)	BDL (<0.2)	BDL (<0.2)	BDL (<0.2)		5 (15)
17	Arsenic as As	mg/l	BDL (<0.005)	BDL (<0.005)	BDL (<0.005)	BDL (<0.005)	BDL (<0.005)	BDL (<0.005)	0.01	0.05
18	Phosphate as PO ₄	mg/l	0.25	0.28	0.46	3.81	2.85	2.98		
19	Hexavalent Chromium as Cr+6	mg/l	BDL (<0.02)	BDL (<0.02)	BDL (<0.02)	BDL (<0.02)	BDL (<0.02)	BDL (<0.02)		
20	Dissolved Oxygen(DO)	mg/l	5.9	5.8	5.2	4.2	6.1	5.6	5mg/L or more	

Sampling and testing done by: SKS Test Labs Pvt.Ltd. **BDL:** Below Detection Limit

^a Health-based guideline values.

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.

^b Figures in parenthesis are maximum limits allowed in the absence of alternate source.

Air Quality

80. Air quality monitoring has been conducted in pre-construction stage on April 21, 2023, and April 22, 2023, at six locations. Test report of ambient air quality is shown in **Table 14** and details of test report are shown in **Appendix 8**. PM₁₀ as well as PM_{2.5} and NO₂ levels were higher than the WHO standards in all the sampling sites while the SO₂ and CO concentration were well below the set limits of WHO.

Table 14: Air Quality test results

S. No.	Locations	Results				
		PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO ₂ (µg/m ³)	CO (mg/m ³)
1	Jait Sagar Nalla Near Arriwali Marriage Garden	65.68	44.84	8.22	16.19	0.56
2	Jait Sagar Nalla Near Meera Bagh Chowki	59.59	39.64	7.78	15.28	0.53
3	City Kotwali Police Thana	62.59	42.98	9.34	16.18	0.57
4	Bharat Petrol Pump (Devpura)	65.56	45.36	10.46	17.07	0.64
5	Nainwa Road Magistrate Colony	59.07	38.18	7.90	15.46	0.52
6	Batching Plant Near Meera Road	60.38	37.43	8.25	14.99	500
WHO AQG level (WHO 2021).		45	15	40	10	4
National Standards for Ambient Air quality (NAAQS)		100	60	80	80	2

Noise Quality

81. There are moderate industrial and development activities in the surrounding areas of municipal limits of Bundi town; therefore, noise quality in town is also moderate. Vehicular movements in the town also increases the noise level of the town. Noise level quality of Bundi was monitored on April 21, 2023 and April 22, 2023 at six locations and the results are depicted in Table 15. When day as well as night noise level compared with National and WHO noise level standards, for residential areas noise levels are higher than Indian and WHO standards, for commercial area the noise level was well below the WHO standards and National standards,.

Table 15. Ambient Noise Level During Pre-construction in Various Locations in Project Town

Ambient Noise Level Monitoring at Bundi (Drainage Sub Project) Town				
Sr. No	Locations	Results		
		Ambient Noise Level (Day Time) (dBA)	Ambient Noise Level (Night Time) (dBA)	
1	Jait Sagar Nalla Near Arriwali Marriage Garden	63.64	51.33	
2	Jait Sagar Nalla Near Meera Bagh Chowki	65.24	49.43	
3	City Kotwali Police Thana	64.24	50.33	
4	Bharat Petrol Pump (Devpura) - Commercial	65.44	52.63	
5	Nainwa Road Magistrate Colony	61.24	44.93	
6	Batching Plant Near Meera Road - Commercial	61.64	48.73	
Area code	Category of Area / Zone	Indian Noise level standards (dBA)	WHO Guidelines value for Noise levels measured out of Doors ^b (One Hour LA _q in dBA)	

		Day Time	Night Time	07:00-22:00	22:00-07:00
1	Industrial area	75	70	70	70
2	Commercial area	65	55	70	70
3	Residential area	55	45	55	45
4	Silence Zone	50	40	55	45

C. Ecological Resources

82. 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

Forest areas

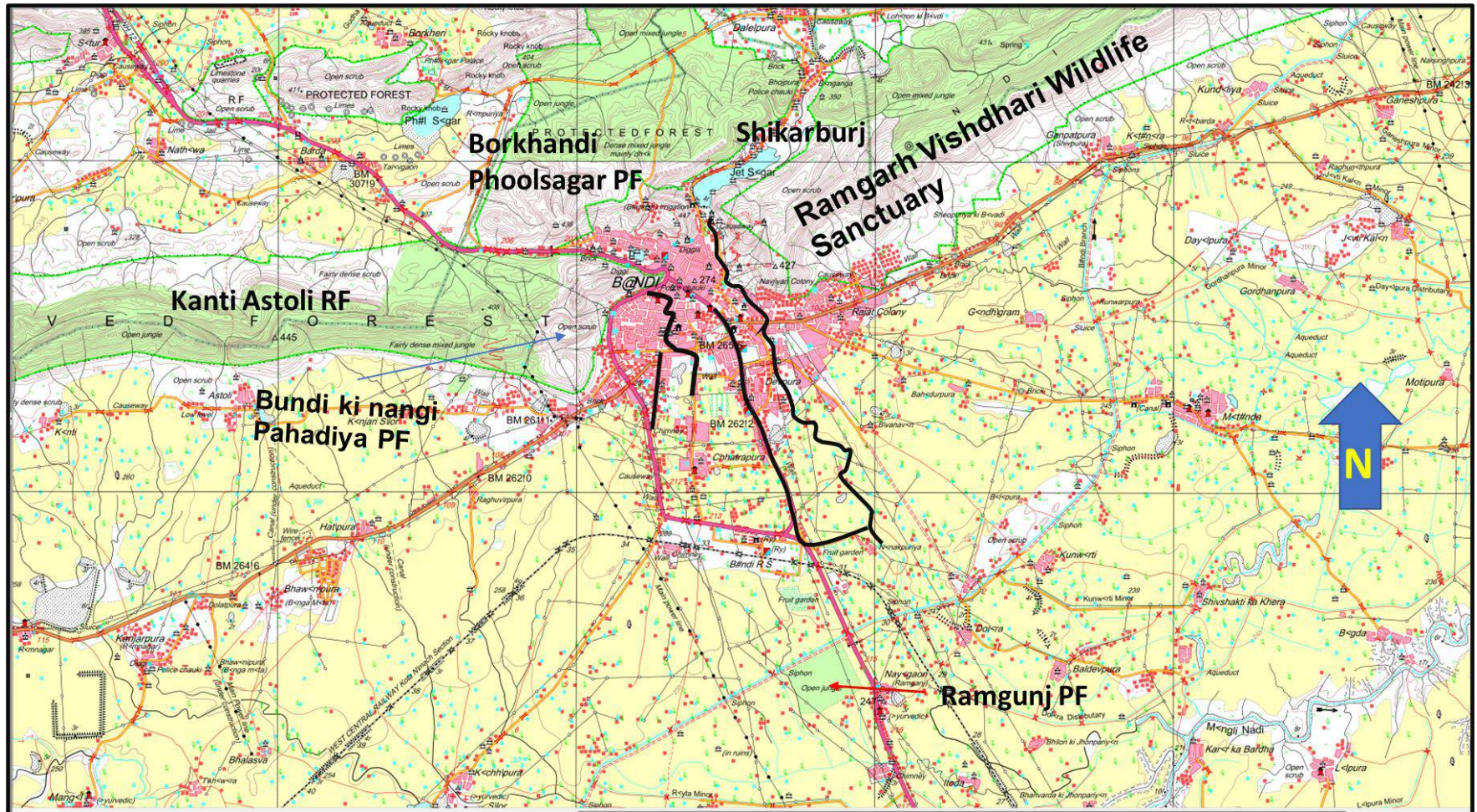
83. The urban area in Bundi is surrounded by land converted for agricultural use. There is no natural habitat in the town, and the flora is limited to artificially planted trees and shrubs, whereas the fauna comprises of domesticated animals (cows, goats, pigs and chickens), plus other species able to live close to man (urban birds, rodents and some insects). There is no protected area nearby the subproject site.

84. Vegetation is sparse and comprises mostly of domesticated species, with limited fauna. There are fishes in most of the rivers and irrigation tanks outside the towns, but no aquatic areas is protected; Rohu (*Labeo rohita*) and sanwal are the most common fish species.

85. As per the year 2021 assessment of the India State of Forest Report 2021 published by Ministry of Environment, Forests and Climate Change (MoEFCC), Bundi District has about 5,776 sqkm area out of which 564.35 sqkm is total forest area. Out of which, one sqkm area is covered with very dense forest, 138.98 sqkm area is covered with moderate dense forest and 424.37 sqkm is open forest The forest area in district has been increased from 7.17 % in 2019 to 9.77% in 2021. About 172.67 sqkm area of Bundi is also covered with scrub forest.

86. The Bundi town in its immediate surrounding are covered many forest blocks these are Kanti Astoli Reserved Forest and Borkhandi Phoolsagar Protected Forest and Bundi Ki Nangi Pahadiya Protected Forest at Northwest. Shirkaburj and Ramgarh Vishdhari Wildlife sanctuary at Northeast. Ramganj Forest block at South of Bundi surrounding STP site. The figure below shows the proposed components and forest area in Bundi town.

Figure 13: Forest map of Bundi showing project components.



87. As per the Champion and Seth Classification system, these forest has tropical dry deciduous (1) Dhok (2) Mixed forest of Dhok and Khai as per forest working plan in year 2011-12 these forest has 57 species of tree, 8 species of Shrubs, 11 species of Climbers, 36 species of Grasses , 35 species of Herbs, 29 species of Mammals, 23 species of Reptiles, 8 species of Fishes , species of 4 species of Amphibians and 86 species of Aves.

Common flora and fauna of these forests are

88. **Trees** - *Emblica officinalis* *Alangium salvifolium*, *Buchanania lanzan*, *Morinda tinctoria*, *Mangifera indica*, *Cassia fistula*, *Hardwickia binata*, *Acacia leucophloea*, *Aillanthus excelsa*, *Sapindus emarginatus*, *Polyalthia longifolia*, *Tamarindus indica*, *Bauhinia variegata*, *Anthocephalus cadamba*, *Mitragyna parvifolia*, *Terminalia arjuna*, *Pongamia pinnata*, *Flacourtia indica*, *Feronia limonia*, *Lagerstromia parviflora*, *Bridelia retusa*, *Kydia calycina*, *Sterculia urens*, *Miliusa tomentosa*, *Ficus hispida* Linn. Etc

89. **Shrubs** - *Zanthium strumarium*, *Calotropis procera*, *Calotropis gigantea*, *Achyranthes aspera*, *Cassia auriculata*, *Clerodendrun Viscosum* , *Adhatoda vasica*, *Calotropis procera*, *Grewia flavencens*, *Securinega leucopyrus*, *Capparis Spinosa*, *Capparis sepiaria*, *Capparis decudua*, *Carissa spinarum*, *Periploca aphylla* etc

90. **Climbers** - *Mucuna pruriens*, *Cayratia carnosa*, *Viscum orientale*, *Oxalis corniculata* , *Ichnocarpus frutescens*, *Millettia auriculata*, *Cissampelos pareira*, *Butea parviflora*, *Celastrus paniculatus*, *Cryptolepis buchanani*, *Asparagus dumosus*; *Tinospora cordifolia*, *Abrus precatorious* etc

91. **Reptiles** - Magger crocodile, Indian sawbaok Indian mud turtle, Starred tortoise, Northern house gecko, Fat tailed gecko, Common garden lizard, Indian chameleon, Common indian monitor, Johr's earth boa, Indian python, Common rat snake, Common indian krait, Indian cobra, Russell's viper, Spiny tailed lizard, Krait, Pitviper

92. **Amphibians** - Common Indian Toad, Marbled Toad, Indian Bull Frog and Burrowing Frog.

93. Other than timber, fuel wood, fodder and The main forest products from these forest blocks are, Tendu leaves, Gums of Salar, Gurjan, Babool, Karaya, Khair Dhok, Safed Dhok (Dhavda)

Protected Areas: Three wildlife Sanctuaries have boundaries in Bundi district

94. A The Sanctuary is located at North to northeast side of town about 350 m distance from starting point of existing Jait Sagar Drain where rehabilitation is proposed. Ramgarh Vishdhari Wildlife Sanctuary acts as a buffer for Ranthambore National Park, which is one of the most famous wildlife sanctuaries in India. It covers an area of about 252 square kilometer. It is rich in biodiversity and home to various kinds of wild animals. The Government of Rajasthan declared it a sanctuary on May 20, 1982 under Section 5 of the Rajasthan Wildlife and Bird Protection Act, 1951. Various types of wild animals like Indian wolf, leopard, striped hyena, sloth bear, golden jackal, chinkara, nilgai and fox can be seen in Ramgarh Vishdhari Wildlife Sanctuary. Featured by dry deciduous forest on Vindhyan formations with the plenteous amount of trees like Khair, Salar, Khirni, Ber, Babool, Mango and Dhok. This Sanctuary is present in the range of Aravali Mountains and one of the major attractions of tourism in Bundi. Recently Ramgarh Vishdhari Sanctuary is declared at tiger reserve and eco sensitive zone notification is in draft

format. Before start of construction subproject's components distance from wildlife sanctuary required to be re-verified by PIU/ PMU. Now Confirmatory survey has been done by the contractor and design drawings has been submitted for approval in PMU.

95. **The National Chambal Sanctuary** – The Sanctuary is located 27 km South- eastern directed proposed Jait Sagar Drain. The Sanctuary is located at Southeast direction to Bundi Town and was set up in 1979 as a riverine sanctuary along an approximately 425 km length of the Chambal River and its ravines stretching over 2-6 km wide along the river. The Project is managed by the Wildlife wing of the Uttar Pradesh Forest Department and is head-quartered at Agra. National Chambal Sanctuary is the main area for the species reintroduction program of the crocodilian species *Gavialis gangeticus* (Gharial). One of the few places to spot the *Platanista gangetica* - Gangetic Dolphins. (National Aquatic Animal) Only known place where nesting of Indian Skimmers is recorded in large numbers. Chambal supports 8 rare turtle species out of the 26 found in the country. Chambal supports more than 320 resident and migrant birds, NCS is a Tristate sanctuary with an area of 635 sq. kms in Uttar Pradesh, spread over Agra and Etawah districts. Part of the NCS also lies in Madhya Pradesh and Rajasthan, The National Chambal Sanctuary is listed as an important bird area (IBA) IN122 and is a proposed Ramsar site.

96. **Jawahar Sagar is a wildlife sanctuary** – The Sanctuary is located at Southwest direction to town about 70 km from Bundi town and 31 km from nearest proposed drain component i.e Jait Sagar Drain. This Sanctuary is in the Kota and Bundi District of Rajasthan. Gandhi Sagar Dam was built on the Chambal River in 1972 to protect crocodiles and Gadiyals. Gandhi Sagar Dam extended to Jawahar Sagar Sanctuary. It is covering an area of 154 sq. km. This sanctuary is part of Mukandra Tiger Reserve.

97. The Sanctuary is house of plant species like Khair, Dhok, Tuberous, Angiosperm, Pteridophytes, Climbers, Fungi, varieties of Algae, Bryophytes etc.

98. Jawahar Sagar is also famous for wildlife, and it has huge varieties of wild animals. The Jawahar Sagar Sanctuary is the home of wild animals. Like Blackbuck, Chinkara, Caracal, Wild Wolf, Sloth Bear, Panther, Hyena, Wild Boar, Chittal, Sambar Deer, Gavial, Crocodiles, Jackal, Porcupine, Nilgai, Hare, Civet, Crane, Four-horned Antelope, Wild Cock.

Table 16: Distance from nearest Wild Life Sanctuaries to Proposed Drains

Drain name	Wildlife Sanctuaries and distance from proposed components		
	Ramgarh Vishdhari Sanctuary	National Chambal Gariyal Sanctuary	Jawahar Sagar Sanctuary
Bundi Bypass - Rani Ji Ki Bawadi - Lanka Gate - ICE Factory to UIDSSMT Nallah	1300 m	30 km	34 km
Khoja Gate to Ice Factory	1100 m	31 km	36 km
Gurudwara Devpura to Nanak Puliya Tiraha	873 m	32 km	34 km
Jait Sagar to Devpura	350 m	27 Km	31 Km
Agarwal Dharamshala to Highway Nallah on Silor Road	1800 m	27 km	32 Km

99. Biodiversity Assessment Report (IBAT Analysis) for Bundi town has been attached with

this report as **Appendix 7**. 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 17 species (EN & CR) concern fauna listed as IUCN Red list, most of which are wild species and not reported in urban areas of Bundi & A one restricted range species of Giant River Prawn is also reported in IBAT, however this species is neither Endangered, Critical Endangered or Vulnerable as per IUCN Status. All proposed drains are located within town's municipality area, the nearest protected area is Ramgarh Vishdhari wildlife sanctuary, about 350 m from proposed rehabilitation of existing Jait Sagar drain, starting from Jait Sagar lake. The works will be conducted within the existing ROW of drain. Drain and wildlife sanctuary are separated by each other with urban settlement, houses, roads and mountains and no negative impact of proposed works are anticipated on wildlife sanctuary. IBAT assessment shows three Key biodiversity areas Bandha Dam, Jawahar Sagar Sanctuary & Ramsagar lake are located about 50 km far from proposed projects locations. However, the Ramgarh Vishdhari wildlife Sanctuary is located about 2 km in north. which is not reflected in IBAT checklist.

D. Economic Development

100. **Land Use:** Municipal area of Bundi encompasses 21.85 sq. km. About one fifth of the land area is urbanized and the rest consists of hills, water bodies and agricultural land. Even within a contiguous urbanized area, only 65% is developed and the remaining are water bodies, agricultural land, and pockets of vacant land. About 44% of developed area is under residential use and 23% under public and semi-public. The high percentage of public and semi-public uses is due to spacious parade and play fields attached to schools.

Table 17: Existing Land Use of Bundi

S. No.	Land Use	Area	% of developed area	% of urban area
1.	Residential	310	41.38	32.62
2.	Commercial	60	7.48	5.90
3.	Industrial	35	19.03	15.00
4.	Government	20	1.68	1.31
5.	Recreation	20	3.02	2.38
6.	Public / semi public	160	9.14	7.20
7.	Circulation	95	18.27	14.40
8.	Total developed area	1280	100	78.81
9.	Vacant and agricultural land	205		21.19
10.	Total urban Area	2185		100.00

***Source:** Bundi Master Plan 2009-2031

101. **Major Crops:** The main crops grown in the Kharif are rice, Jowar, Maize, Seasmum and other Kharif pulses, Soyabeen and Groundnut. The main Rabi crops are wheat, gram, other rabi pulses, rape & mustard, taramira, coriander in recent years there has been substantial

increase in the area under rice, soyabean and rape & mustard.

102. **Industrial Area:** Rajasthan state industries development & investment corporation Ltd. RIICO is developing industrial areas in the state. There are 6 industrial areas at present in the district. There are located at Bundi by pass road. Bundi Nainwa Road Bundi. Chittorgarh road, Govindpur Bawari, Indergarh and Hattipura. Total Industrial area in Bundi is 208.37 acre. District has seven operational large scale industries, three operational medium scale industries and 6665 small scale and Micro Enterprises filed memorandum up to March 2019 is in which 22,992 persons are employed and fixed Investment in total enterprises is 3579.424 million.

103. **Industrial Effluents:** Industries exist under Rajasthan State Industrial Development & Investment Corporation Ltd (RIICO), which are outside the town area and small amount of effluent disposed scattered in local *nallahs*. As reported by the local MC, the responsibility of effluent disposal is under RIICO's own and its connected with existing sewer network. The individual industry should treat their effluent to bring it to the required standard before final disposal.

104. **Solid Waste management:** Bundi Nagar Parishad practices door-to-door waste collection in the part of the town, and in other parts waste is collected through community dust bins located in various places. Regular sweeping is carried out by Bundi Nagar Parishad. Waste from houses, dust bins and other areas is collected, and transported to Kanjri Silore landfill site 4 km from Bundi. Landfill site is owned and managed by Nagar Nigam Bundi

105. **Power Supply.** In Bundi District, the distribution of power is controlled through 8 Big 132 K.V. sub-stations. These sub stations are located in Bundi and Lakheri from these substations 33 K.V. line has been erected 77 sub- substations for supplying electricity. To strengthen and make regular power supply, a new substation is being constructed at village Namana, panchayat samiti Talera.

Transport:

Bundi is well connected through air, rail and road network.

106. **By Air:** Nearest airport to Bundi town is Kota airport about 45 km from Bundi which operates only form medical or VIP services. The Sanganer Airport of Jaipur is the nearest commercial airport to Bundi. The Sanganer airport is at approximately 200 kilometres from Bundi. Taxi services are available between Bundi to Sanganer airport. This airport is well connected with various major cities of India through frequent flights.

107. **By Rail:** Kota Railway Station is the nearest railway station to the city. It is at a distance of 35 kilometres. Various trains play between Kota railway station and other railway stations of major Indian cities. One can take taxi or bus to reach Kota railway station.

108. **By Road:** Bundi is well connected through a network of roads. It is at a distance of 35 kilometres from Kota and nearly 200 kilometres from Jaipur. Other important cities that are accessible from here include Jaipur, Ajmer, Agra and New Delhi, which are situated at a distance of 170 km, 155 km, 310 km and 390 km respectively. The state transport buses connect the city with major cities in the state of Rajasthan. The total length of road in district in 2019-20 was 2841.7 kms.

E. Socio Cultural Resources

Demography

109. The Bundi City is in Rajasthan state of India. As per provisional reports of Census India, population of Bundi in 2011 is 103,286; of which male and female are 53,628 and 49,658 respectively. Although Bundi City has population of 103,286; its urban / metropolitan population is 104,919 of which 54,485 are males and 50,434 are females. Males constituted 52% of the population, while females made up 48%. Bundi had an average literacy rate of 82%, higher than the national average of 73%, with male literacy of 89.77% and female literacy of 73.77%. 12% of the population was under six years of age.

History, Culture and Tourism

110. Bundi is the ancient capital of the legendary Hada dynasty of rulers. It is described as the heart of Hadoti and it was founded sometime in the 13th century. It was vested by Rudyard Kipling. It is the first destination, in Hadoti that is reached from Jaipur by road. Set in a narrow encircling gorge, the palaces and fortress of Bundi have a fairy tale like quality about them. Few other palaces in India have such a picturesque location. Isolated and independent, the entire township arrears like a miniature painting, frozen in time for the traveller.

111. The Bundi palace, built of locally quarried stone, presents one of the finest examples of Rajput architecture. Intricately carved brackets, pillars and balconies and sculpted elephants are used liberally. Of special interest here are the Diwan-I-Am, Hathi Pol and the Naubat Khana. Also located in the palace is the famous Chitra Shala which provides a colourful glimpse of history - the walls and ceiling of this palace are completely covered with paintings of the Bundi school. Hunting and court scenes, festivals, processions, animal and bird life and scenes from Lord Krishna's life are still in very good condition.

112. Bundi has other palaces and hunting lodges like the Phool Sagar Palace, Sukh Mahal and Shikar Burj. Each palace has its own historical importance Phool Sagar houses a collection of murals: done by the Italian prisoners of war who were held here; Sukh Niwas Palace evokes memories of Rudyard Kipling who not only stayed here but is believe to have found inspiration for his famous work Kim from the scenes that he saw here. Kshar Bagh, though not a palace, is interesting for its locations as well as the carvings on the 66 royal cenotaphs.

113. Bundi is also known for its Baories or step-wells. Unique to Rajasthan and Gujarat, the step-wells served as water reservoirs for the months of summer when there was a scarcity of drinking water.

114. At one time, there were over fifty such wells in Bundi but most of them have suffered the ravages of time. One very good example still to be found in the heart of the town is called Raniji-ki-Baori. It has exquisitely carved pillars and ornate archways - even the simple function of drawing water from the well became a special occasion for the womenfolk, they dressed up in their finery to visit these elaborate structures. On the road to Kota is a splendid 17th century monument - the 84 pillared chhatri still in extremely good condition and worth a visit.

115. The Bundi District of Rajasthan has been an important tourist destination for both the foreign and domestic tourists. The place offers a unique culture with baoris, palaces & forts, lakes and the beautiful natural surroundings. The apparent tourism potential of this place inspired many to organise fairs and festivals to give a boost to the tourism resources. Efforts were made for vital efforts to streamline tourism and make it an important agent for the growth

and development of this area. Unfortunately, this could not take the shape of a people's movement and the zeal and enthusiasm faded out slowly and the inputs more or less could not be sustained. At the same time the place needs efforts on our parts if we want to make it an important tourist destination. The rainy season is very special with the Kajli Teej Festival. The weather is generally pleasant except for a patch of the hot summer. During the monsoons in Bundi a local festival called Kajli Teej is uniquely celebrated here. A local fair is also held on this occasion exhibiting lot of local handicraft items including Katar (dagger), paintings and bangles etc. Both the urban and the rural people join this festive occasion. Besides the Kajli Teej a drive into the countryside all across with the water streams crossing at innumerable places, camels grazing the green pastures and the peacock hanging around makes it a special monsoon drive. The cool temperament of this pollution free destination makes it a wonderful experience. A taste of the local maize (Bhutta) roasted in coal oven and served with salt n lemon gives a special delight in the monsoons. Although the local Kuttha Baati (food) is quite popular in the region. The Bundi miniature paintings attracts the traveller and from the highway it seems as if the town itself is a miniature painting frozen in time.

116. Bundi has moderate tourist inflows with main attractions being Ratan –Daulat , Chhatra Mahal, Chitra Shala, Char Bhujaji , Jain Temple at Naharji Ka Chauhatta, Laxminath Temple in Sadar Bazar, Damdame ki Maszid.

Tourist attractions and Historical places in Bundi

117. The tourist attractions in Bundi include glorious medieval forts, temples, havelis and magnificent palaces. The tourists will love to visit Bundi because of its serene atmosphere and strikingly expressive landscape. Bundi is located at the foothills of a large hill with a splendid lake at the center of city.

118. **Taragarh Fort** is the prime attraction in the city of Bundi. This fort was constructed in the 14th century. The visitors will find a large battlement (Bhim Burj) inside the fort. One will also see a cannon and a large reservoir. The reservoir was carved by a single piece of rock.

119. **The Bundi Palace** is another place of attraction, located in close proximity to the Taragarh Fort. One will see some exquisite murals that typify the glorious era of Indian royalty.

120. Bundi is also famous for its large number of age old step-wells (locally called Baoris). The step-wells that have been maintained till today are the Nagar Sagar Kund, Raniji ki Baori, and Nawal Sagar.

121. One of the prominent tourist attractions is a temple of Lord Varuna (God of Rains), half submerged in the water of the **Nawal Sagar Lake**. The visitors, uses boat to reach temple.

122. **Dabhai Kund** in Bundi is considered to be one of the largest kunds in Bundi. It is one of the most popular and frequented places of attractions in the city. These kunds are nothing but steep wells that were constructed by the Rajput royal kings.

123. Prithviraj Chauhan constructed Dabhai Kund in Bundi. The steep wells stand evidence to the glory of such Rajput kings and royal members. Also known as the Jail Kund, this is a must visit destination for tourists frequenting Bundi.

124. The level of the water in the steep wells was quite deep. There are many steps that lead

to the Dabhai Kund at Bundi. There are many intricate carvings that can be seen on the staircases that ultimately lead to the Dabhai Kund, Bundi. Apart from Dabhai Kund you can also visit other famous tourist attractions of the city such as Sukh Mahal, Taragarh Fort, Nawal Sagar Lake,

125. **Ratan Daulat** is a major spot of attraction in the small yet elegant city of Bundi . The grand monument in Bundi stands as a testimonial to the chivalry and grand achievements of the great Rajput rulers. Raja Rao Ratan Singh, who was one of the noble and brave Rajput kings, constructed Ratan Daulat in Bundi.

126. Ratan Daulat at Bundi stands as an exceptional monument for the innovation that is involved in its construction and design. The Rajput king had immense talent and vision and that is reflected in the architecture of the structure.

127. Ratan Daulat, Bundi has a stable that can accommodate nine horses. A royal look had been imparted to the entire structure. There are beautiful and complex carvings on the coaches in the stable, with a horse in front of each of them. The Hatia Pol is another important feature of the Ratan Daulat of Bundi.

Other important places in Bundi

128. **City Gates (7 nos)** - Situated at the entrance of the different locations of Bundi town and popular with tourists and locals for its view of Bundi town.

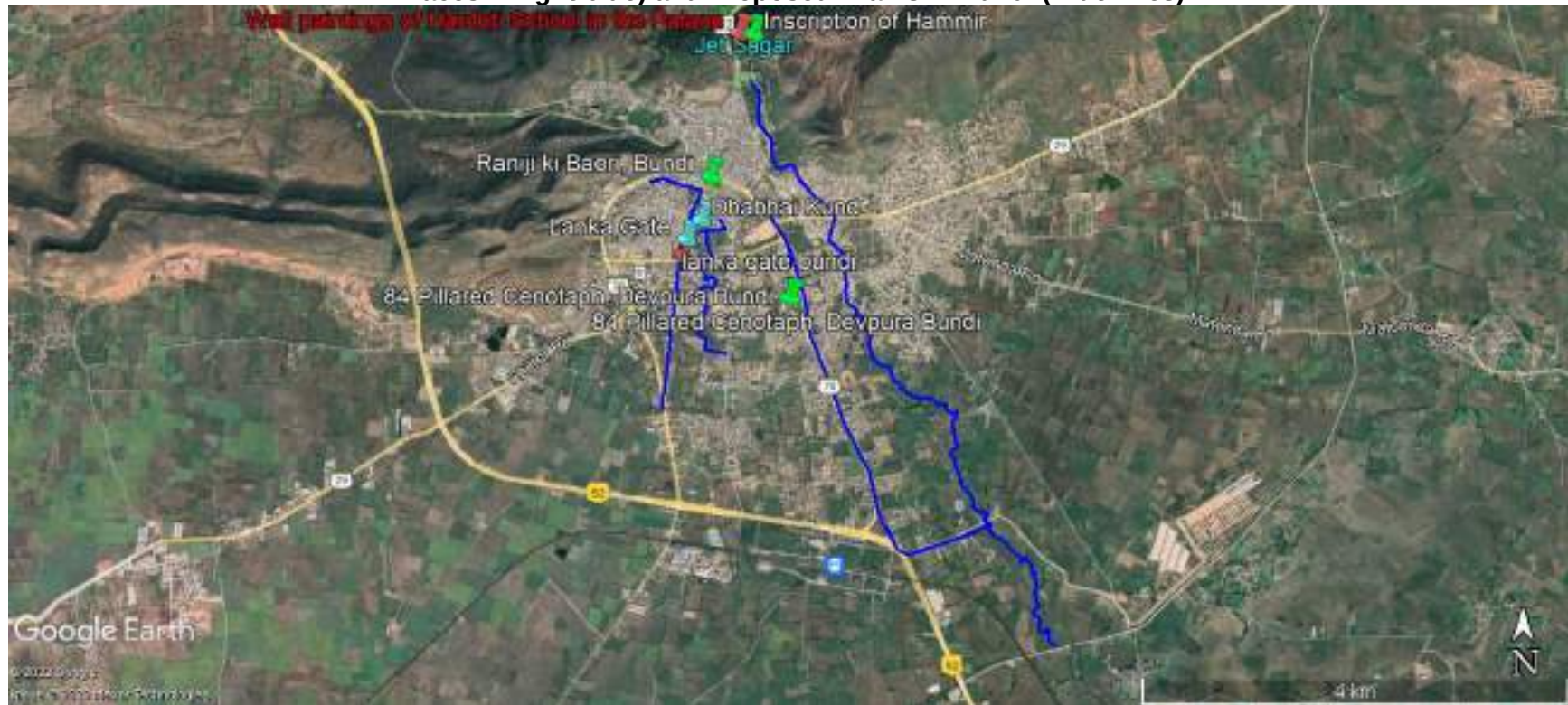
129. **Nagar Sagar Kund** - The kunds (pair of matching step wells) are located near to Indira Market and Azad Park - Nagar Sagar is an artificial lake which tends to dry up if the monsoon is poor. In the centre of the lake is a temple for the Aryan god of water.

130. **Naruki Baori** - The Baori is located in the heart of mohallas in ward no.36 in the northern part of the city and Shukl Baori gate is the closest heritage structure to the baori

131. **Nahardhos ki Baori** - located in the southern part of the town near Khoja Gate, the closest heritage structure to the baori

Naval Sagar Lake - The lake is located on the right side to the approach road of Taragarh Fort in the western part of the city

Figure 14: Google Earth Imagery Showing ASI Protect Monument (Red) State Protected in (Green), Other Important Tourist Places in Lght blue) and Proposed Drains in Bundi (Blue lines)



Protected monuments

132. Bundi town has three state Protected Monuments, Raniji Ki Bawari (step well), 84 Pillared Cenotaph (Shiv temple) and Inscription of Hammir and one ASI monument (Wall Paintings of Hardoti School in the Palace). All project components are located outside the subproject component area. List of ASI and State protected monuments in Bundi town is provided in **Appendix 2**.

133. **Wall Paintings of Hardoti School in the Palace:** Is one ASI protected monument in Bundi town, The nearest components is Jait Sagar Drain located about 300 m from this protected monument. Some of the old wall paintings (murals) in the Garh Palace of Bundi form a Monument of National Importance. They are examples for one of the Rajput painting art schools, which is named after the historical Hadoti region, especially for the Bundi style. Located Inside the fort is a small palace named Dudh Mahal which has beautiful frescoes and a portion of the palace changed into a Rang Shala (art gallery). For centuries, Bundi remained an important school of the Rajasthani style of miniature paintings. The site is one of the rock art sites discovered in the Bundi-Bhilwara-Tonk region of Rajasthan and Rock paintings discovered are from various eras such as the Mesolithic, Chalcolithic, Metal Age and even prehistoric.

134. Raniji ki Baori, Shiv Temple and Chaurasi Khambon ki Chhatri & Inscription of Hammir are state protected monuments in Bundi and all subproject components are located outside these monument boundaries. The nearest drain is located about 50 m from Rani ji ki Bauri.

135. **Raniji ki Baori :** The town of Bundi is renowned for its baoris, or stepwells. Raniji ki Baori (Queen's stepwell) is the largest among the over 50 baoris of the town. Baoris were commissioned by the ruling royalty to take care of water needs during the months of drought. This baori was constructed in 1699 by Rani Nathavati Ji, the younger queen of the ruling Maharao Raja Anirudh Singh of Bundi. 46 metre deep, this stepped well is a multi-storeyed structure decorated with brilliantly carved pillars and a high-arched gate. Each floor has dedicated places of worship for the people to pay homage. One can enter the baori through a narrow doorway marked by four pillars. Lifelike elephant statues made of stone guard the corners. The baori is a medieval marvel of construction and design. Baoris also worked as social assembly areas in those times since local townsfolk gathered here often.

136. **Shiv Temple and Chaurasi Khambon ki Chhatri** or 84 Pillared Cenotaph is a famous temple type structure which is devoted to Shiva and was built by Maharaha Anirudh Singh or as they call in Hadoti language Rao Raja Anirudh Singh.

137. The structure is as tall as a three-storey house and built in the year 1683 AD. The main attraction of this site is its 84 pillars. It is said that a soul gets 84, 00,000 chances to take birth on planet Earth as got created the same amount of species.

Figure 15: Google Earth Imagery Showing ASI Protected Wall Paintings and State Protected Inscription of Hammir



Figure 16: Google Earth Imagery Showing State Protected Rani ji KI Baori and Nearby Area

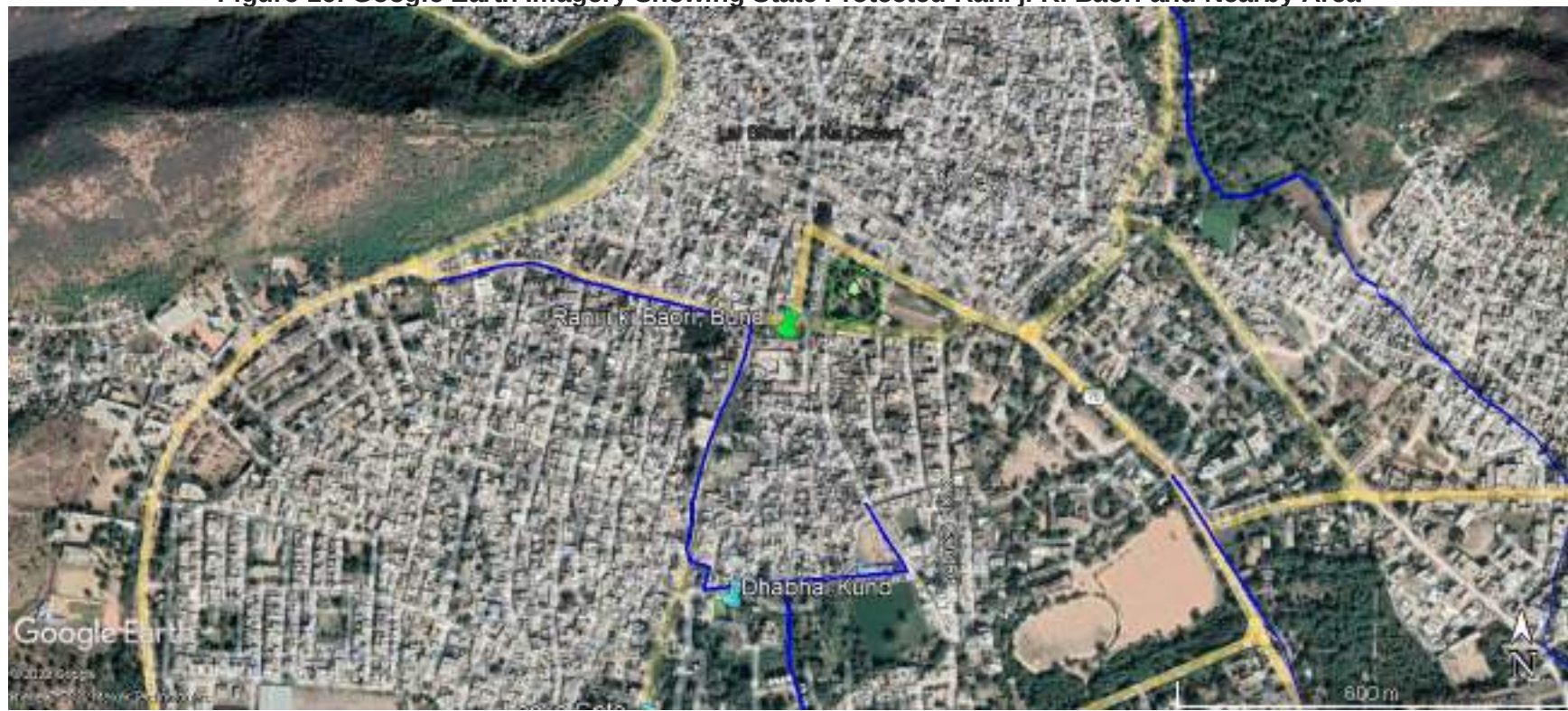


Figure 17: Google Earth Imagery Showing State Protected 84 Pillared Cenotaph and Nearby Area



Table 18: Distance of Nearest Protected Monument and Proposed Components

	Monument	Jait Sagar Drain	Jaipur Bypass to FCI godam along with Rani ji ki Bawadi	Khoja Gate Ganesh ji to Ice Factory	Gurudwara Devpura to Nanak Puliya Tiraha	Silor Road (Agarwal Dharamshala to highway nalla on Silor road)
ASI Protected	Wall paintings of Hardoti School in the Palace	300 m	1400 m	1630 m	2120 m	1580 m
State protected	Raniji ki Baori	720 m	50 m	60 m	630 m	715 m
	84 Pillared Cenotaph, Devpura Bundi	670 m	780 m	1350 m	200 m	1000m
	Inscription of hammir	300 m	1440 m	1640	2150 m	1570 m

138. In Tranche 3 of Phase II of RUIDP works for restoration and preservation of the following heritage structures were conducted in Bundi town: the city gates (7nos), Nagar-Sagar Kund, Nawal Sagar lake with Chattri and temple inside the lake, Nahar Dhos ki Baori, Naruki Baori and 84 Pillared Cenotaph, which includes (a) Covering of the existing drains and nallah; (b) Construction of walkways; (c) Improvement of road surfaces by paving; (d) Construction of storm water drains; (e) Repair of damaged walls; (f) Up gradation of toilet facilities; (g) Construction/Up gradation of drinking water hut; (h) construction of platforms; (i) Creating open parking spaces; and (j) Provision of benches, dustbins, lights, signages etc.

Fairs and Festivals:

139. **Teej** - Teej is a fasting festival for Hindu women. It takes place on the third day of the Shukla Paksha of the Sawan month of the Hindu which normally falls between late July to early September. This festival is dedicated to Goddess Parvati and celebrates her return to Lord Shiva. Teej is in praise of marital bliss and the well-being of spouse and children. Falling in the Hindu month of Bhado, Teej also celebrates the arrival of the long-awaited monsoon after a brutally hot summer. The festival is a three-day celebration which includes both rigid fasting and scrumptious feasting. According to Hindu mythology, after the self-immolation of Sati, Lord Shiva became grief-stricken and went into a meditative state. It is believed, it took Sati 108 subsequent births to bring Lord Shiva out of his meditative state. Her 108th birth was in the form of Parvati. Thus, married women seek the blessings of Goddess Parvati on Teej Festival for marital bliss.

140. On the occasion of Teej Festival, women observe a fast and pray through the night. In the morning, they bathe and dress in red sarees and fine jewellery to worship Goddess Parvati. The major attractions of Teej Festival are the swings that are fixed to the branches of large trees, on which the women take turns to enjoy swinging. Special songs are sung, and the women decorate their hands with henna. Married daughters are presented with sweets and clothes by their mothers. The girls engaged to be married receive gifts of henna, bangles, clothes, and sweets from the in-laws.

141. Though Teej is celebrated all through the state but in Bundi it is celebrated on the 3rd day of Bhadra whereas at the other it is celebrated on the third day of Sharavana in other places. The

festival starts with the traditional procession of goddess Teej in a decorated palanquin from the Naval Sagar. The procession has decorated elephants, camels' bands artistes and cultural groups depicting the place.

142. **Lohri** - Lohri marks the culmination of winter and is celebrated on the 13th day of January in the month of Paush or Magh, a day before Makar Sankranti. Lohri celebrates fertility and the spark of life. People gather around bonfires, throw sweets, puffed rice and popcorn into the flames, sing popular songs and exchange greetings.

143. On this day children go from door to door to collect funds for community bonfires which are lit up in the evening. The gatherings and celebrations make Lohri a community festival. An extremely auspicious day, Lohri marks the sun's entry into the 'Makar Rashi' (northern hemisphere). The period beginning from 14 January lasting till 14 July, is known as Uttarayan. It is also the last day of the month of Maargazhi, the ninth month of the lunar calendar. The festival marks the winter solstice and is the day of celebrations. Astronomically after Lohri, the length of days starts increasing as the sun begins to progress northwards. The Bhagawad Gita deems it an extremely sacred and auspicious time when Lord Krishna manifests himself most tangibly.

144. The festival though connected to Punjabi roots is seen to widen its presence and is celebrated with all the joy and fervour in Rajasthan. It's a nice warm way to say goodbye to the harsh winters of North India.

145. **Makar Sankranti (The Kite flying festival)** - Makara Sankranti is one of the few ancient Indian festivals that has been observed according to solar cycles, while most festivals are set by the lunar cycle of the lunisolar (चंद्र – सौर) Hindu calendar. Being a festival that celebrates the solar cycle, it almost always falls on the same Gregorian date every year (January 14/15).

146. "Makar Sankranti" or "Sakraat" in the Rajasthani language is one of the major festivals in the state of Rajasthan. The day is celebrated with special Rajasthani delicacies and sweets such as pheeni (either with sweet milk or sugar syrup dipped), til-paati, gajak, kheer, ghevar, pakodi, puwa, and til- laddoo.

147. Especially, the women of this region observe a ritual in which they give any type of object (related to household, make-up or food) to 13 married women. The first Sankranti experienced by a married woman is of significance as she is invited by her parents and brothers to their houses with her husband for a big feast. People invite friends and relatives (especially their sisters and daughters) to their home for special festival meals (called as "Sankrant Bhoj"). People give out small gifts such as til-gud (jaggery), fruits, dry khichadi, etc. to Brahmins or the needy ones.

148. **Vasant Panchami** - Vasant Panchami is an important Indian festival celebrated every year in the month of Magh according to the Hindu calendar. Celebrated on the Fifth day of Magh, the day falls somewhere in February or March according to the Gregorian calendar. The significance of the day lies in the worship of Goddess Saraswati, the symbol of wisdom and also the onset of the spring season. According to the popular belief, the origins of this festival lie in the Aryan period. Aryans came and settled in India through Khyber Pass, crossing the Saraswati River among many others. Being a primitive civilization, most of their development took place along the banks of the river Saraswati. Thus. River Saraswati began to be associated with fertility and knowledge. It is then that the day began to be celebrated. According to mythology, After Kalidasa was married off to a beautiful princess through trickery, the princess kicked him out of her bed as she learned that he was foolish. Following this, Kalidasa went to commit suicide, upon which

Saraswati emerged from the waters and asked him to take a dip there. After taking a dip in the holy waters, Kalidasa became knowledgeable and began writing poetry. Thus, Vasant Panchami is celebrated to venerate Goddess Saraswati, the goddess of education and learning. In today's times, the festival is celebrated by farmers as the on-coming of the spring season. The day is largely celebrated in northern parts of India. Here, people offer food to the Brahmins and organize rituals in the name of Goddess Saraswati. The colour yellow is the predominant colour associated with the festival, the origins of which are supposed to be the fields of mustard which can be seen in Punjab and Haryana during this period. Kite Flying is also commonly associated with this Festival. Children, as well as adults, fly kites on this day to celebrate freedom and enjoyment. Another tradition associated with this day is that of initiating studies in the young. Young children often begin learning on this day, which is believed to be the reason why the school sessions start in March. Sweets with a yellow hue are also distributed on this day and people can also be seen donating books and other literary material to the poor. Section wise photos of drains are attached in **Appendix 5**

Table 19: Environmental Features of Proposed Alignment

S. No	Subproject component	Environmental Features of the Site	Photographs
1	Jaipur Bypass to FCI Godown along with Rani ji ki Bawadi Start Point: Lat 25°26'28.06"N End Point: Long 75°38'2.97"E Total Length: 2.693 Km	- It is the main drain, which is not lined at present. - Earthen open drain is covered by Arandi (castor oil plant). - Mostly shrubs of <i>Prosopis juliflora</i> and 17 tree of <i>Acacia nilotica</i> required cutting - Blackish water in running condition is observed. - This drain runs along the Kota Road in its initial stretch of half kilometre then turns in south direction and runs along the city main road for about 375 meters. The drain then turns in east direction with alignment along the city major road. Major land use around the alignment is residential. - The drain again turns in south direction and joins kuchha drain and area along alignment is predominantly agricultural in this section with residential land use in patches. The drain finally meets another existing kuchha drain at Chatarpura road. - The drain finally discharges in Mangli river and no intervention beyond the point (Chatarpura road to Mangli River) are proposed in this unlined drain and major land use beyond this point to Mangli river is agricultural. - Section 0.60 m x 0.60 m to 2.00 m x 1.50 m, Length 2.693 Km. (RCC Box/ RCC Cast in Situ) and Municipality land is available for construction of required section.	 Jaipur bypass drain before FCI Godown

S. No	Subproject component	Environmental Features of the Site	Photographs
			 End point of FCI Godown drain  Drain receiving discharge from FCI Godown drain
2.	Jait Sagar to Devpura Nala Start Point: Lat 25.450137° End Point: Long 75.643877° Total Length: 5.90 Km	- Jait Sagar drain starts below Jait Sagar Lake ends at Devpura and is also the only drain which carries the excess water of Jait Sagar Lake to Mangli river - The drain is not lined capacity is not sufficient to hold excess water from Jait Sagar lake in rainy season, results in inundation of roads and other city areas. - Dense shrubs are present at both sides of the drains. Earthen open drain is covered	

S. No	Subproject component	Environmental Features of the Site	Photographs
		by Arandi (castor oil plant), Shrubs of <i>Prosopis juliflora</i> along the drain on landside and 39 trees of <i>Acacia nelotica</i> which required to cut. • Drain is full of running blackish water • The drain runs amid agricultural area in its initial stretch and runs in north to south direction. After about 1 km of initial stretch of drain it runs along the area having major land use as residential up to Police Parade Ground. After Police Parade ground it again aligned in areas having mix land use with dominant agricultural and patchy residential. The drain in its major length is not aligned with any road as it is a major city drain with larger discharge section (primarily width). Lining of drain is proposed from starting point (below Jait Sagar Dam) till New Mandi road. Beyond this point up to Mangli River the drain travels in area with major land use as agricultural and no lining is proposed for this distal section. • Section 5.0 m x 4.5 m to 6.5 m x 3.5 m, Length 5.900 Km traverses through the entire city. • It passes through open land (uninhabited) in the initial stretch (less than 1 km), then through the colonies, and finally again through the open land (about 2.6 km). • The layout of the drain is mostly of cross-country nature and its ROW falls within the jurisdiction of the municipality	Jait Sagar Spillway  Jait Sagar Drain tail end  Jait Sagar Drain to Mangli River
3.	Gurudwara Devpura to Nanak Puliya Tiraha Drain Start Point: Lat:25.436163° End Point: Lat:25.43672° Existing Length – 2.0 Km Extension Proposed – 2.08 Km Total Length – 4.008 Km	• This drain starts at Gurudwara Devpura and ends at Nanak Puliya Tiraha Drain. • 4 tree of <i>Acacia nelotica</i> required to be cut. • This drain from Gurudwara Devpura to Tiraha Drain is aligned along the Bundi Road (Major City Road) to its most of length. Major land use in initial stretches in predominately residential, while agricultural land use is observed in few patches. The drain turns toward east direction near Ajmer Kota Road and runs about 800 m to fall in Jait Sagar Drain, which finally discharges in Mangli river. In its last 800 m stretch it runs along New Mandi Road and land use around the	

S. No	Subproject component	Environmental Features of the Site	Photographs
		alignment is predominantly agricultural in this section. - Section of the drain is proposed to be 1.5x1.5 m to 2.0x2.0 m increasing in downstream. - The available section is sufficient enough for construction. The drain is proposed to be RCC box type (3.2 Km) in proximal sections while stone pitching is proposed in downstream stretch of 838 m.	
4.	Agarwal Dharam Shaala to Highway Nallah Start Point: Lat:25.433928° End Point: Long:75.63716° Existing Length – 600 m Extension Proposed – 600 m Total Length – 1.210 Km	- Proposed drain Starting point from Agarwal Dharamasla to Highway Nallah to Silor road. - This drain passes through market area and 80% of drain is damaged and overflows during rains. - This drain is aligned along the Seelor Road (Major City Road) and major land use along the drain is residential in its initial stretch (700 m), while in reaming part the major land use is agricultural with few residential build-ups. This drain joins a kuchha drain at Highway Nallah and finally discharges in Gurudwara Devpura to Nanak Puliya Tiraha Drain, which finally discharged in Mangli River through an existing unlined drain. - Section of the drain is proposed to have a section varying from 1.0 x1.0 m to 1.5x 1.5 m. - The drain is proposed to be RCC Box type. Land is available for construction of required section as the proposed width decreased owing to increase in depth.. The land belongs to Municipal Council, Bundi. - No tree cutting is required.	   Silore road drain outfall into FCI Outfall drain

S. No	Subproject component	Environmental Features of the Site	Photographs
5.	Khoja Gate Ganesh Ji to Ice Factory Length 0.407 km Start Point: Lat:25.437095° End Point: Long:75.641531° Total Length – 0.407Km	- This drain starts at Khoja Gate and runs north to south direction aligned with Major city road. The drain turns in west direction after travelling 120 metres and aligned in major city road till it falls in Jaipur Bypass to FCI Godam drain. Land use in the proximity of drain is residential and no trees are observed in the alignment of the drain. Blackish water flows drain. - Section of the drain varies (increases from initial point to outfall points Section 0.60 m x 0.60 m to 0.75 m x 0.75 m, Length 0.407 Km. (RCC Box) and land is available for construction of required section. The land belongs to Municipal Council, Bundi. - No tree cutting is required.	

VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Introduction

149. 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.

150. 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.

151. 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).

152. 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 (REA) Checklist has been used to screen the project for environmental impacts and to determine the scope of the IEE.

153. 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 (Nagar Parishad) 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. The nearest protected area is Ramgarh Vishdhari wildlife sanctuary, about 350 m from proposed rehabilitation of existing Jait Sagar drain, starting from Jait Sagar lake. The works will be conducted within the existing ROW of drain. Drain and wildlife sanctuary are separated by each other with urban settlement, houses, roads and mountains and no negative impact of proposed works are anticipated on wildlife sanctuary. Appendix 7 provides Integrated Biodiversity Assessment Report (IBAT analysis) for Bundi.

Tree Cutting

154. There are several shrubs (like Vilayati Babool (*Prosopis Juliflora*) , Ber (*Ziziphus sps.*), Mandar (*Calotropis gigantea*) and small trees (having less than 25 cm girth) on vacant lands/ROW on the alignment of proposed drains, which grow commonly on vacant lands and therefore not considered in preliminary survey. As per preliminary survey, it was accessed that 60 number of trees may be affected due to proposed drain works, however the number is expected to reduce after the final survey of alignment of all the five drains as all efforts are being made in designs to align in such a way that brings down to minimum number of trees get affected. The final number of tree cutting required will be determined after the final design of all the drains and will be updated in next update of IEE.

155. During service improvement plan before construction begins, this alignment will be again reviewed and tree cutting will be minimised as much as possible. Maximum possible tree will be transplanted to minimise the negative impact of tree cutting. Tree which required to be cut after taking permission from tree authority, will be replaced by planting 3 times or as suggested by tree authority (which ever in maximum).

156. Following measures need to be implemented to minimize and/or compensate for the loss of tree cover.

- (i) Minimize removal of trees by adopting to site condition and with appropriate layout design of proposed drains;
- (ii) Tree with less than 50 cm girth will be transplanted to other locations
- (iii) Obtain prior permission for tree cutting at any site that may require tree cutting finalized during service improvement plan; and
- (iv) Plant and maintain 3 trees for each tree that is removed.
- (v) Community consultation will be conducted before and during tree cutting

B. Pre-construction Impacts

157. **Utilities.** Telephone lines, electric poles and wires, water lines, gas pipe 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;
- take prior permission from/intimation to concerned line agencies for shifting the existing utilities; and
- Instruct construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services.

158. **Site selection of construction work camps, stockpile areas, storage areas, and disposal areas.** Construction work camps, stockpile areas, storage areas and disposal sites to be considered so that identified sites should 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 contractor in compliance with these conditions and the same will be reflected in Site Environmental Management Plan (SEMP) which is to be prepared by contractor prior to start of construction and approved by PIU.

159. **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. 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.

160. **Debris and Silt disposal.** Prior to the commencement of works, contractor shall identify a debris disposal site in consultation with the PIU and Consultant. Contractor will follow all the

prescribed rules⁷ 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 Municipality through PIU for approval
- Debris disposal site shall be at least 200 m away from surface water bodies⁸.
- 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.

C. Construction Impacts

161. The civil works for the subproject include earth work excavation for proposed drains. Earth work excavation will be undertaken by machine (backhoe excavator). Subproject includes construction of box type close drains and open drains. Sufficient care will be taken while excavation for proposed drains so that existing utilities and cables are not damaged. Trenches deeper than 1.5 m will be protected by shoring/bracings/step cutting to avoid collapse of trenches, and also to avoid any risk to surrounding buildings. The minimum working hours will be eight hours daily, the total duration of each stage depends on the soil condition and other local features. Extraneous soil after excavation of drains shall be used for filling low lying area or stored/ dumped in approved soil disposal sites.

162. 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, construction 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 and NOC from land owners (e.g. PWD, Railways, ULB etc.) from concerned departments prior to start of construction works, is required

163. 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 and construction works at earliest in a stretch (iv) provide adequate barricades and road safety signage during proposed 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.

⁷Construction and Demolition Waste Management Rules 2016

⁸ 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.

164. Construction of drains will be started from downstream point, which is general practice of gravity system and will be connected to end point of existing drains at last phase at the time of interconnection. New drains will be used to remove water of existing waterlogged area/ drains.

165. **Demolition works.** In the initial stage of project planning it is accessed that there may be requirement of demolition of structures such as CC road, boundary walls, religious structures etc.. Where 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.

166. **Storage and Disposal of excavated earth and silt.** A large quantity of soil and silt will be excavated for construction/strengthening of drains. Some part of this excavated soil will be reused for construction of embankments and/or surface levelling; 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 rules⁹ and shall identify a soil/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 Municipal Council 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

167. **Silt and sludge removal** is regular activity conducted by ULB every year before start of monsoon. The Provision are considered in BOQ for 1044 cum silt and 1044 cum sludge clearance from proposed drains. As the silt is mixed with the water, handling and transport of silt/sediment in semi-solid / slurry form will lead to spillage of contaminated water/slurry. Accumulated drain water with silt/sediment, potentially mixed with solid waste / wastewater in some places, may present hazardous conditions for removal of sediment/silt. Following measures are suggested to safely desilt and dispose the desilted material:

- Desilting process of shall be conducted in dry season only.

⁹ Construction and Demolition Waste Management Rules 2016 and Solid Waste Management Rules 2016

- Prior to desilting process, the drains shall be allowed dry so that there is no standing water on silt / sediment
- Do not conduct manual desilting process, use appropriate equipment / implements
- Desilting process shall be conducted in such a way that water content of the silt/sediment is low, so that contaminated water is not spilled during the loading, transport and unloading process.;
- Workers shall be provided with appropriate PPE's; masks with oxygen cylinders shall be made available at the site, which shall be utilised during emergency
- Identify beneficial uses or dispose at suitable disposal site in consultation with the PIU/ULB:

168. **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 government¹⁰;
- 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, 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

169. **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

¹⁰CTE 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.

- Maintain all the equipment and vehicles to reduce emission of smoke and keep pollution under control and keep records of periodic maintenance
- Conduct ambient air quality monitoring periodically as per Environmental Management Plan EMP

170. **Surface Water Quality.** There is no any surface water source near the proposed site, which can be polluted due to construction activities, however, run-off from stockpiled materials and chemical contamination from fuels and lubricants during construction works can contaminate the drainage system of town. 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 sillage 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)

171. **Noise and Vibration Levels.** Construction works will be conducted along the roads ROW and vacant lands in Bundi 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 nearby 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 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)

172. 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	Test Result dB (A)	
	Day Time (6:00 am to 10:pm)	Night Time (10:00 pm to 6:00 am)
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence zone	45	40

Source: Noise Pollution (Regulation and Control) Rules, 2000

- Illumination should be as follows-

Minimum illumination (lx) ¹¹	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

¹¹ Nighttime Lighting Guidelines for Work Zones A guide for developing a lighting plan for nighttime work zones, American Traffic Safety Services Association, April, 2013.

- 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.

173. **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. Unplanned 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 minimize 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.

174. **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 groundwater quality monitoring according to the Environmental Management Plan (EMP).

175. **Accessibility.** Excavation along the roads, hauling of construction materials and operation of equipment on-site can cause traffic problems. During construction traffic on these roads will require diversion and temporary closer. 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.
- Excavated roads to be wetted through water sprinkling to reduce dust emission
- Providing and fixing Barricading using 40 mm dia M.S. pipe vertical and horizontal posts
- Providing and fixing OPEN including strutting, shoring and packing cavities (wherever required)
- Providing and fixing CLOSE timbering including strutting, shoring and packing cavities (wherever required)

176. **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-13**);
- 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

177. **Socio-Economic-Employment.** Manpower will be required during the 18-months construction 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.

178. **Occupational Health and Safety.** Workers need to be mindful of the occupational hazards which can arise from working on roads, in height and excavation works. Potential impacts are negative and long-term but reversible by mitigation measures. Construction contractor has deputed experienced EHS personnel for following assigned works:

- 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 Training¹² 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;
- Implement necessary structural safety and site safety measures to prevent collapse of trenches, and damage / structural failure / collapse of adjacent buildings, boundary walls and other structures; provide proper braces, struts, anchors as required in the trench and for protecting the adjoining structures; avoid placing of material, equipment, waste, close to the trench edges
- 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;

¹² 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.

- 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.

179. **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.
- Survey the surrounding vulnerable buildings for likely issues in structural stability/differential settlement during the excavation works;
- Implement necessary structural safety and site safety measures to prevent collapse of trenches, and damage / structural failure / collapse of adjacent buildings, boundary walls and other structures; provide proper braces, struts, anchors as required in the trench and for protecting the adjoining structures; avoid placing of material, equipment, waste, close to the trench edges
- Provide prior information to the local people about the nature and duration of work;
- 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.
- Do not park heavy construction machinery on roads
- Avoid storing excavated material on road.

180. **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;
- Provide 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 accommodation¹³ 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;
- 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.

181. 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 alignment of Nala 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.

182. Physical Cultural Resources. Proposed drain (Bundi Bypass-ice factory via Raniji ki baori) is passing about 50 m away from the state protected monument, Rani ji ki Baori. The monument and drain is separated by road and buildings, no new works are proposed in the area only upgradation of existing drain with RCC box type drains is proposed. Therefore, no impacts envisaged but risk of uncovering archeological remains, given the long history of town, during the excavations cannot be ruled out completely. Construction contractors therefore should follow the

13

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

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 local Archaeological Department / Museum office if a find is suspected and take any action, they require to ensure its removal or protection in situ; and
- (iv) Prepare a chance find protocol (**Appendix C-26**)

183. **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 construction work through metal sheets and temporary bridges
- Locate entry and exit points in areas where there is low potential for traffic congestion;

D. Operation and Maintenance Impacts

184. **Proposed Drainage System:** The system has a design life of 15/30 years, during which shall not require major repairs or refurbishments and should operate with little maintenance beyond routine actions required to keep the system 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 and repairing.

185. Regular cleaning of drains, specially before start of monsoon season is required to avoid any blockage and overflow of drains, which may ultimately create public nuisance such as ponding in nearby places. Identify the suitable place for disposal of silt and solid waste, away from habitation and dispose the silt and solid waste after cleaning of drains; in a scientific manner so that it may not cause public nuisance or any harm to stray animals.

186. The new drains will contribute to an improvement in the physical appearance and condition of the town by helping to remove the large and unsightly pools of water that are an almost permanent feature of the town. The new drains should also help to ensure that similar

pools do not re-form in the future. With these projects implemented the quality of the town environment would then improve significantly. Removal of blockages in the drain, if left stockpiled alongside the drains, will have adverse impacts on the appearance of the area. Not only is this unhygienic, but it is also inefficient, as much of this material inevitably returns to the drains, where it may cause further blockage. Local body will also ensure that no wastewater and sewage enter in to proposed drains. Local body will also conduct awareness programs to prevent disposal of solid waste into drains.

187. **Community Safety:** All drains are proposed in Bundi town within colonies and less populated area. RCC Box type of drains will be laid in populated area within road & for road crossing and open type and stone pitching of drains will be laid in less populated area on wide roads on corner of roads within ROW. In each section, parapet walls on both sides of open drains are proposed in design for public safety.

188. **Project Benefits.** The citizens of the Bundi city will be the major beneficiaries of the improved drainage system, as the unsightly and unhygienic pools of standing wastewater will gradually disappear and should not recur in future. This should then improve the appearance and environment of the town, as well as protecting the ancient buildings and sites from the water damage they are exposed to at present. If, as expected, this ultimately brings more tourists into the town, then the citizens could benefit socio-economically from the related growth in the economy apart from improved environmental conditions of city.

VII. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. Overview

189. 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.

190. 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, Bundi Nagar Nigam, 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

191. The public consultation and disclosure program is a continuous process throughout the project implementation, including project planning, design and construction. Informal and formal consultations at different locations were also conducted during social and environmental impact

assessment in Bundi in July 2022. (**Appendix 4**).

1. Consultation during Project Preparation

192. Institutional consultations were conducted with the Governmental Departments such as Local Self Government Department (Municipal Corporation, Bundi), Pollution Control Board, Nagar Parishad , etc. The project proposals are formulated in consultation with Bundi Nagar Parishad and the proposals have been finalized only after certification of both the authorities that the proposals suit the requirements of the City.

193. 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.

194. Informal and formal consultation are conducted with local population of the area, about at 8 places along with proposed alignment with about 100 persons (90 male and 10 females) in the month of January and July 2022. Discussions were held about proposed project components, EMP measures, ownership of land, tree cutting, water logging problems and general people perception for proposed project. Project information was given to participants and their suggestions and comments were enquired about. People were agreed with proposed drainage works as they were suffering with poor drainage conditions in these locations. It was noted that people are willing to extend their cooperation as the proposed activities are supposed to enhance the environmental conditions 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 opined that an appropriate operation and maintenance system should be in place, for proposed drainage system, for its best functioning and to have the maximum health and aesthetic benefits. Details of public consultations are given in **Appendix 4**.

195. A town-level City Level Committee (CLC) has been formed in Bundi district by Government orders. City Level Committee meeting was organized during the detailed design stage to which representatives of primary and secondary stakeholders were invited. City Level Stakeholder committee meeting was organized for Bundi in District Head Quarter, Bundi on dtd. 20.10.2021 to discuss the matter of proposed Sewerage and Drainage works in Bundi under the chairmanship of District Collector, Bundi. DPR consultants, RUDSICO-EAP officials, PHED officials, Municipal Corporation, Bundi -North and South officials, Bundi Nagar Parishad officials, Water Resource Department, PWD and other invitee members. Proposed scope of works and technology of proposed sewerage and drainage works in Bundi was discussed in the meeting and approval was given for proposed works by Committee in this meeting. The project was agreed by the committee for further course of action by RUDSICO-EAP. Details of CLC meeting, minutes and photographs are attached in **Appendix 4**.

2. Consultation During Construction

196. Prior to start of construction, Bundi Nagar Parishad and PIU with the assistance of Consultants conducted 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 town level, focus group meetings were 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.

197. A constant communication is being 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. PIU with the help of Community Awareness and Participation Consultant (CAPC) is organizing public meetings to appraise the communities about the progress on the implementation of EMP. Meeting are also being organized at the potential hotspots/sensitive locations before and during the construction.

198. A town level consultation during the pre-construction period was organised on March 24, 2023 which attended by stakeholders including elected representatives and the minutes of the stakeholder meeting, photographs and attendance sheet is attached as Appendix 4.

C. Information Disclosure

199. Draft IEE has already been disclosed, Executive summary of the IEE is translated in the local language and made available at the offices of Bundi Nagar Parishad , RUDSICO-EAP- PMU and PIU. Copies of summary will be provided to participants of city level workshop to be organized in Bundi. 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 is will be placed in the official website of the Nagar Parishad /RUDSICO-EAP after approval of the IEE by Government and ADB. Stakeholders were made aware of grievance register and redress mechanism.

200. Public information campaigns via newspaper/radio/TV, to explain the project details to a wider population were conducted primarily by circulating pamphlets. 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.

201. Local communities are 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.

202. Project related information shall be disclosed through public consultation and making relevant documents available in public locations. PMU and PIUs shall provide relevant safeguards information in a timely manner, in an accessible place and in a form and languages understandable to affected person and other stakeholders. For illiterate people, other suitable communication methods will be used. Before start of construction works, social outreach team (SOT) of contractor and CAPP team are providing advance public notice/ public information by distributing pamphlets showing works details, toll free complaint registration number, also by individual consultation with each and every household and shop owner of the area/section.

203. The following documents shall be made available at the offices of project agencies - PMU, PIU and Block level offices for public reference, and shall also be uploaded on respective websites.

- (i) Summary of project and draft IEE (in Hindi and English);
- (ii) Draft IEE Report (in English);

- (iii) Final IEE Report (in English);
- (iv) Updated/amended IEE (in English);
- (v) Corrective action plan prepared during project implementation (English); and
- (vi) Semi-annual Environmental Monitoring Reports (English).

204. A concise summary of project and draft IEE report (in Hindi), providing all necessary details of designs, implementation arrangements, subproject locations, likely issues and mitigation and monitoring measures and grievance redress mechanism, shall be made available to the stakeholders at consultation meetings. This should also provide contact information of project agency. This summary shall also be displayed at the notice boards of PMU, PIU and other public places. During project implementation, relevant information about any major changes to project scope will be shared with beneficiaries, affected persons, vulnerable groups, and other stakeholders. Draft IEE has already been posted on ADB and RUDSICO website. Further, the following will be posted on ADB website. PMU will send written endorsement to ADB for disclosing these documents:

- (i) final IEE;
- (ii) a new or updated IEE and corrective action plan prepared during project implementation, if any; and
- (iii) environmental monitoring reports.

VIII. GRIEVANCE REDRESS MECHANISM

A. Project Specific Grievance Redress Mechanism

205. A project-specific, three-tier grievance redress mechanism (GRM) covers both environment and social issues. The GRM is 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)¹⁴ the system was effective in timely resolution of grievances in a transparent manner.¹⁵ The multichannel, project-specific, three-tier GRM is functional at

¹⁴ The procedures followed for grievance redress during implementation of RSTDSP 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.

¹⁵ 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

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.¹⁶

206. Common Grievance Redress Mechanism. A common GRM is 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.

207. 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.

B. Grievance Redress Process

208. 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 site¹⁷ or by sending a WhatsApp message to the PIU¹⁸ or by dialling the phone number of town level PIU/CAPPC or by dialling a toll-free number.¹⁹ Any aggrieved person can also avail the facilities of online grievance monitoring system 'Rajasthan Sampark' portal to register their grievances which are a parallel mechanism of grievance registration, in addition to the project GRM.²⁰ 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

architecture for the RSTDSP GRM remains similar, with some refinement, taking into account the changes in institutional setup proposed for project implementation.

¹⁶ 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.

¹⁷ 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.

¹⁸ 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.

¹⁹ Project contractors in all project towns will have a toll-free number with specific working hours for registration of grievances related to RSTDSP.

²⁰ <http://www.sampark.rajasthan.gov.in/RajSamWelcome.aspx>

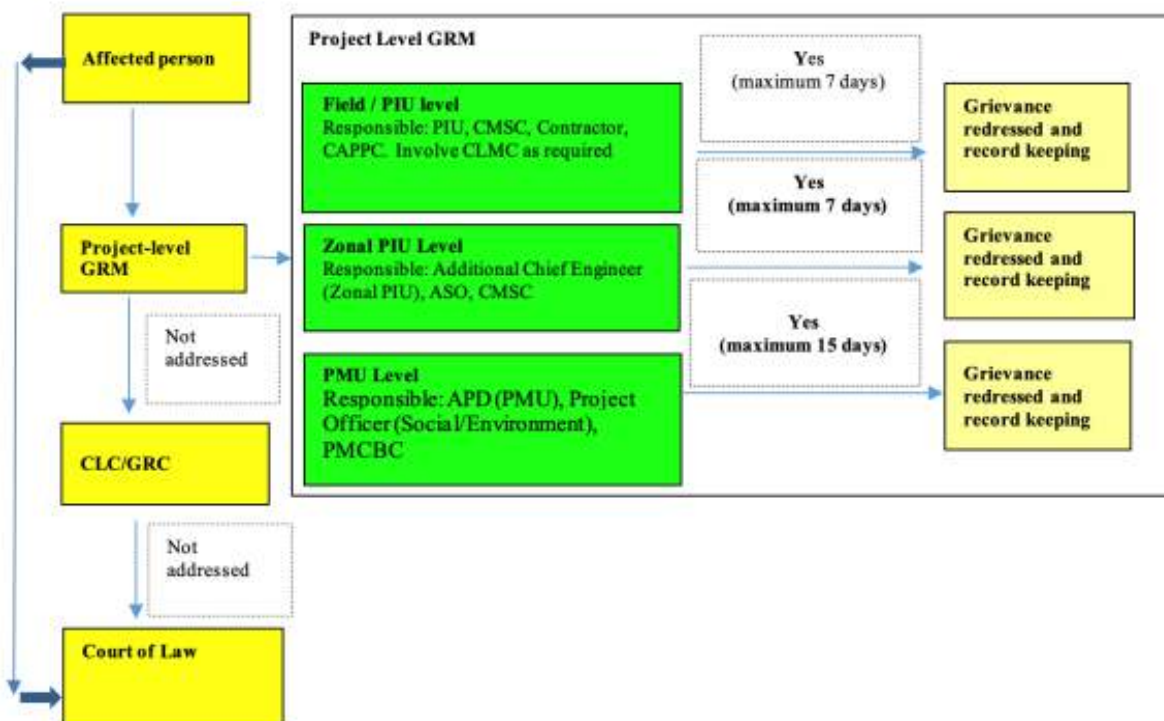
most easily accessible or first level of contact for quick resolution of grievances. Contact numbers and names of the concerned PIU safeguard and safety officer, contractors, CAPPC and CMSC personal will be posted at all construction sites at visible locations.

- (iv) **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)²¹ will be involved in resolution of grievances at the 1st level;
- (v) **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 complaint/grievance in discussion with the ASO, field level PIU, CMSC, CAPPC and the contractor; and
- (vi) **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)..
- (vii) 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.²² In its role as a GRC, 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.
- (viii) The multi-tier GRM for the project is outlined below (**Figure 18**), 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.

²¹ 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.

²² 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 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.

Figure 18: Grievance Redress Process



APD = Additional Project Director, ASO = Assistant Safeguards Officer, CAPPCC = 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.

209. 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), 2013.²³

210. 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 Mechanism²⁴.

211. **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

²³The Authority admits grievance only with reference to the Land Acquisition and R&R issues under the RFCTLARRA, 2013.

²⁴ Accountability Mechanism. <http://www.adb.org/Accountability-Mechanism/default.asp>

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.

212. **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.

213. **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.

214. 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 Bundi) 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

215. 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 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.

216. 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.

217. 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.

218. Tables for Environment Management Plan during Design, Pre-construction, Construction and Operation phases are given below-

Table 20: Design Stage Environmental Management Plan

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
Location impacts of proposed components	Nearby community may be affected due to increased pollution during construction and operation	(v) Work method should be prepared 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	List of pre-approved sites for -construction work camps, areas for stockpile, storage and disposal -Waste management plan	Consultants/PMU	No cost required
Requirement of tree cutting	Tree cutting may result loss of aesthetics and increase in air pollution	(i) project designs should be done 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	As per RUDSICO-EAP policy; Tree Cutting Approvals; Compensatory Afforestation Plan;	Consultants/PIU/PMU	No cost required
Energy Efficiency	Loss of natural resources	(vi) Use energy efficient electrical equipment (vii) Provision of use of energy efficient equipment in contract agreements and BOQ	As per BEE norms	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	EMP included in Bid Document	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.	EMP included in Bid Document	PMU	Project Costs

Table 21: Environmental Management Plan of Anticipated Impacts during Pre-Construction

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost Source and of Funds
Compliance with environmental subproject selection criteria	Environmental impacts due to subproject	Compliance with environmental subproject selection criteria A compliance checklist is appended to this report (Appendix 3)	Consents, permits, clearance, NOCs, etc.	PIU and Bundi Nagar Parishad	PMU	No costs required
Legal compliance	Environmental legal noncompliance may attract legal actions Failure to obtain necessary consents, permits, NOCs etc. can result to design revisions and/or stoppage of works	(i) Obtain all consents, clearances (CTE/CTO from RSPCB), permits NOCs etc. before start of construction works (ii) Ensure that all necessary approvals for construction to be obtained by contractor are in place before start of construction	Consents, permits, clearance, NOCs, etc.	PIU/Consultants in coordination of Bundi Development Authority	PMU	Cost of obtaining all consents, permits, clearance, NOCs etc. prior to start of civil works responsibility of PIU.
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 pipe line within proposed project area	(i) Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary	-List and maps showing utilities to be shifted (i) List of affected utilities and operators; (ii) Bid document to include requirement	Contractor in collaboration with PIU and with approval of PMU	Consultant / PIU	No cost required. Mitigation measures are part of TOR of

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost Source and of Funds
		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 (Appendix C-13) and traffic management plan (Appendix C-14)	for a contingency plan for service interruptions (example provision of water if disruption is more than 24 hours), spoil management plan (Appendix C-13), and traffic management plan (Appendix C-14)			PMU, PIU and Consultants
Construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.	Disruption to traffic flow and sensitive receptors	(i) Prioritize areas within or nearest possible vacant space in the project location; (ii) 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;	-List of pre-approved sites for construction work camps, areas for stockpile, storage and disposal -Waste management plan - Written consent of landowner/s (not lessee/s) for reuse of excess spoils to agricultural land	Contractor to finalize locations in consultation and approval of PIU	Consultant / 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 Compliance	of Responsible for Implementation	Monitoring of Mitigation	Cost Source Funds	and of
		(iii) Do not consider residential areas; (iv) Take extreme care in selecting sites to avoid direct disposal to water body which will inconvenience the community. (v) For excess spoil disposal, ensure (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 site; and (d) site is minimum 250 m away from sensitive locations like settlements, ponds/lakes or other water bodies.					

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost Source and of Funds
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.	(i) Prioritize sites already permitted by the Department of Mines and Geology (ii) 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 (iii) If additional quarries will be required after construction is started, inform construction contractor to obtain a written approval from PIU.	(i) List of approved quarry sites and sources of materials; (ii) Bid document to include requirement for verification of suitability of sources and permit for additional quarry sites if necessary.	Contractor to prepare list of approved quarry sites and sources of materials with the approval of PIU	PMU	No cost required. Mitigation measures are part of TOR of PIU and Consultants and also part of contractual terms
Consents, permits, clearances, NOCs, etc.	Failure to obtain necessary consents, permits, NOCs, etc. can result to design revisions and/or stoppage of works	(i) Obtain all necessary consents, permits, clearance, NOCs, etc. prior to award of civil works. (ii) Following consents are required- Tree cutting- local authority Storage, handling and transport of hazardous materials- RSPCB	Consents, permits, clearance, NOCs, etc. Incorporated in final design and communicated to contractors.	PIU and Consultants	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

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost Source and of Funds
		Sand mining, quarries, borrow areas- Department of mines and Geology Traffic diversion/road cutting- local authority, traffic police (ii) Ensure that all necessary approvals for construction to be obtained by contractor are in place before start of construction (iii) Acknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs, etc. (iv) Include in detailed design drawings and documents all conditions and provisions if necessary				part of TOR of PIU and Consultants

Table 22: 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	(i) Certificate of Completion (Safeguards Compliance Orientation) (ii) Posting of Certification of Completion at worksites (iii) Posting of EMP at worksites	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 construction resulting to dusts and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulphur oxides,	(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; (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	(i) Location of stockpiles; (ii) Complaints from sensitive receptors; (iii) Heavy equipment and machinery with air pollution control devices; (iv) Certification that vehicles are compliant with Air Act (v) Quarterly environmental monitoring report for ambient air, noise, water and soil	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
	particulate matter, nitrous oxides, and hydrocarbons.					
Water quality	Mobilization of settled silt materials, and chemical contamination from fuels and lubricants during construction can contaminate nearby surface water quality.	(i) Prepare and implement a spoils management plan (ii) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets; (iii) 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)	(i) Areas for stockpiles, storage of fuels and lubricants and waste materials; (ii) Number of silt traps installed along trenches leading to water bodies; (iii) Records of surface water quality Monitoring; (iv) Effectiveness of water management measures; (v) No visible degradation to nearby drainages, Nalas or waterbodies due to civil works	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
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;	(i) Complaints from sensitive receptors; (ii) Use of silencers in noise-producing equipment and sound barriers; (iii) Equivalent day and night time noise levels (see Appendix C-7 of this IEE)-	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
		(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	No complaints from sensitive receptors;			
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, 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	(i) Areas for storage of fuels and lubricants and waste materials; (ii) Number of oil traps installed in oil and lubricant storage areas; -Complaints from sensitive receptors; -CTO and CTE compliance; Monitoring Reports;	Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Drain desilting	Contamination of land, surface and groundwater; occupational and	(i) Desilting process of shall be conducted in dry season only (ii) Prior to desilting process, the drains shall be allowed dry so that there is no standing water on silt / sediment	(i) desilting schedule and proposed method (ii) PPEs to workers	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
	community health and safety	(iii) Do not conduct manual desilting process, use appropriate equipment / implements (iv) Desilting process shall be conducted in such a way that water content of the silt/sediment is low, so that contaminated water is not spilled during the loading, transport and unloading process.; (v) Workers shall be provided with appropriate PPE's; masks with oxygen cylinders shall be made available at the site, which shall be utilised during emergency (vi) identify beneficial uses or dispose at suitable disposal site in consultation with the PIU/ULB:	(iii) Reuse or disposal site identification			
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	(i) Complaints from sensitive receptors; (ii) Worksite clear of hazardous wastes such as oil/fuel (iv) Worksite clear of any excess excavated earth, excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers As per Appendix C-13.	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
		(vii) Request PIU to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.				
Existing Infrastructure and Facilities	Disruption of service and damage to existing infrastructure at specified project location	(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 (iii) Take prior permission from concerned departments for shifting/removing the utilities (iv) inform nearby community in advance about the nature and timings of disturbance	As per contingency plan	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures 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	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;	(i) Traffic route during construction works including number of permanent signages, barricades and flagmen on 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
		(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 through consultations and by providing sign boards informing nature and duration of construction 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.	(ii) Complaints from sensitive receptors; (iii) Number of signages placed at project location. As per Traffic Management Plan given in Appendix C-14 .			
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,	(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.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		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.				
Socio-Economic - Employment	Generation of temporary employment and increase in local revenue	(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; (ii) Secure construction materials from local market. (iii) Comply with labor laws	(i) Employment records; (ii) Records of sources of materials (iii) Compliance to labor laws (see Appendix C-12 of this IEE)	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
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-12 of this IEE) (B) Ensure that qualified EHS personnel is deputed to look the H&S matter, EHS personnel should ensure to comply following- (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 mask	(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
		and ear plugs; (c) OH&S Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) 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) Implement necessary structural safety and site safety measures to prevent collapse of trenches, and damage / structural failure / collapse of adjacent buildings, boundary walls and other structures; provide proper braces, struts, anchors as required in the trench and for protecting the adjoining structures; avoid placing of material, equipment, waste, close to the trench edges (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:	noxious substances; (vii) record of H&S orientation trainings (viii) personal protective equipment; (ix) % of moving equipment outfitted 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
		(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 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;				

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(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 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	(i) Traffic Management Plan (Appendix C-14); (ii) Complaints from sensitive receptors	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
		potentially serious accidents caused by equipment malfunction or premature failure. (iv) Implement necessary structural safety and site safety measures to prevent collapse of trenches, and damage / structural failure / collapse of adjacent buildings, boundary walls and other structures; provide proper braces, struts, anchors as required in the trench and for protecting the adjoining structures; avoid placing of material, equipment, waste, close to the trench edges (v) Provide road signs and flag persons to warn of on-going trenching activities.				
Safety requirements for deep trench works	Accidents, and risk hazard	Complete information on the underground structures (such as water pipelines, sewers, gas mains, electrical conduit system and other civic facilities) should be collected before doing the excavation work. Proper precautions shall be taken to prevent accident to the workmen engaged in excavation work and for the general public All trenches in soil more than 1.5 m deep shall be securely shored and timbered. All trenches in friable or unstable rock exceeding 1.5 m in depth	Contractor's method statement for excavations On-site verification	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
		shall be securely shored and timbered Where the sides of trenches are sloped but not within 1.5 m of the bottom, the vertical sides shall be shored and the shoring shall extend at least 30 cm above the vertical sides. When open spaced sheathing is used, a toe board shall be provided to prevent material rolling down the slope and falling into the part of the trench with vertical walls. Shoring and timbering shall be carried along with the opening of a trench but when conditions permit, protection work, such as sheet piling may be done before the excavation commences. Approved quality of material with adequate structural strength shall be used for shoring and timbering a trench. Workers shall be instructed to use safety devices and appliances provided to them whenever it is necessary to do so Workers who are not aware of the hazards specific to the work shall not be permitted to proceed with the work without being properly instructed. Safety helmets shall be worn by all persons entering trench where hazards from falling stones, timber or other materials exist				

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		Appropriate safety footwear (rubber boots, protective covers, etc.,) shall be worn by labours who are engaged in work requiring such protection Sides of excavation shall be inspected by PIU/PMDSC during the course of excavation from time to time and after every rain, storm or other hazard-increasing occurrence and protection against slides and cavings shall be increased, if necessary				
Safety of sensitive groups (children, elders etc.) and others pedestrians in narrow streets	Trench excavation 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; (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 neighbourhood 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 use of fuels, oils,	(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; (iv) Ensure conditions of livability at work camps are maintained at	(i) Complaints from sensitive receptors; (ii) Drinking water and sanitation facilities for employees – (iii) Condition in list of preapproved sites for construction work camps, areas	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
	solvents, and lubricants Unsanitary and poor living conditions for workers	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.	for stockpile, storage and disposal prepared by the Contractor.			
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 equipment 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	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
		mix concrete from batching plant to be used, otherwise the concrete should be prepared away from residential areas and brought to the site (vii) All the noise activity like hammering, cutting, crushing, running of heavy equipment 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 equipment's and				

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		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 works (xvi) Old persons and pregnant women and women having small kids should not work in night time (xvii) All the vehicles and equipment's 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				
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 construction work in such a way that no	Chance find protocol (Appendix C-26)	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
		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/hindrane/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 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&24)	Compliance of COVID-19 protocol and guidelines	Construction contractor	CMSC/ PIU	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 regressed using	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 clean-up is satisfactory.	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
		the 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.				

Table 23: 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
Cleaning of drainage	All work sites- Cleaning of drains may cause traffic disturbances, nuisances, public & worker safety	Remove the silts and other solid waste after cleaning the drains from site and dispose at approved dumping site in scientific manner Ensure traffic management during cleaning of drains and transportation of silt and solid waste	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
Illegal discharge of wastewater and solid waste into drains	Contamination and creating insanitary conditions	Local body to ensure that no wastewater outlets are connected to or discharging into drains Create awareness, and conduct IEC activities on solid waste disposal into drains; display boards carrying the messages of DO's and Don'ts	Visual inspection	Municipal Council Bundi	Municipal Council Bundi	Municipal Council Bundi

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost Source and of Funds
Check the blockages, overflow problem in drains	It may affect the draining system, overflow problem may contaminate land, water and create public health issues	Regular cleaning of drains, specially before start of monsoon to avoid blockages Implementation of regular O&M schedules	Follows regular O & M schedule	Municipal Council Bundi	Municipal Council Bundi	Municipal Council Bundi
Disposal of silt and solid waste	Unsafe disposal of silt and solid waste may cause public nuisance and health issues	Identify the suitable place for disposal of silt and solid waste, away from habitation, in a scientific manner so that it may not cause public nuisance	Disposal site at suitable location	Municipal Council Bundi	Municipal Council Bundi	Municipal Council Bundi
Safety precautions during drainage cleaning	Health and safety risk to workers engaged in drainage cleaning	Ensure all the safety equipment are available during manual cleaning As far as possible, use mechanical cleaning for cleaning of drains	-Training and Awareness campaign for Occupational, Health & Safety to ensure the use of PPE's.	Municipal Council Bundi	Municipal Council Bundi	Municipal Council Bundi

Table 24: 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	Alignment of all five drains	Tree cutting permit taken, Tree cutting done (If 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 batching plants, crusher, hot mix plant. DG sets etc.	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 Contractor
Ambient air quality	12 locations Bundi Bypass-Ice factory nala- 2 nos. Khoja gate-ice factory Nala-2 Nos Gurudwara Devpura – Nanak puliya Nala- 2 nos Jait sagar – devpura nala-2 Nos Agarwal Dharmsala to	PM ₁₀ , PM _{2.5} , NO ₂ , SO ₂ , CO	Quarterly except Monsoon period	Contractor	Contractor

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost Source & of Funds
	highway nallaor-2 Nos				
Ambient noise	12 locations Bundi Byepass- Icefactory nala- 2 nos. Khoja gate-ice factory Nala-2 Nos Gurudwara devpura – Nanak puliya Nala- 2 nos Jait sagar – devpura nala-2 Nos Agarwal Dhamsala to highway nallaor-2 Nos	Day time and night time noise levels	Quarterly	Contractor	Contractor

Table 25: Environmental Monitoring Plan of Anticipated Impacts during Operation

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
Monitoring of drain conditions	Full length of both the drains	Cracks, blockage, leakages etc.	Monthly	Municipal Council Bundi	Municipal Council Bundi
Monitoring of plantations	Plantations locations	Nos. of tree survived	monthly	Municipal Council Bundi	Municipal Council Bundi
Disposal of silt and solid waste after cleaning of drains	Full length of both the drains	Identify suitable site and disposal of silt and solid waste in scientific manner	Monthly/ when required	Municipal Council Bundi	Municipal Council Bundi

B. Institutional Arrangements

219. The Local Self Government Department (LGSD) is the executing agency which is responsible for the overall strategic guidance and ensures 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 Honourable 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.

220. 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.

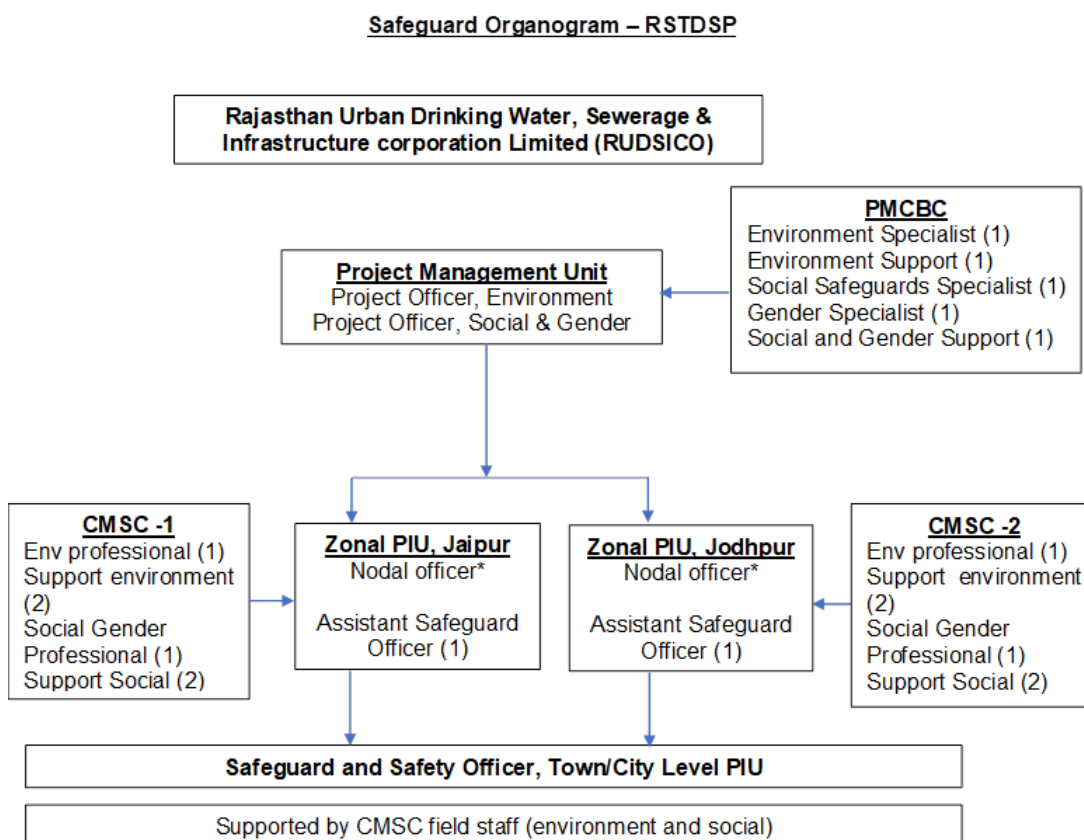
221. The PMU is being supported by the Project Management and Capacity Building Consultants (PMCBC). The PMCBC shall manage preparation/vetting design documents, tendering of contracts, implementation of resettlement, environmental management and gender action plans; setting and managing project performance 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.

222. 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.

223. **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. 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.

224. **Community awareness and public participation consultants (CAPPC)**- CAPC core unit is already established at PMU, Jaipur and at fields in ongoing 6 project towns. CAPC field team and PIU is also established. 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 Bundi.

225. **Figure 19** shows Environmental Safeguards Implementation Arrangements within RUDSICO-EAP and **Table 26** summarize the institutional responsibility of environmental safeguards implementation at all stages of the project.

Figure 19: 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.

226. **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 Bundi, 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 26**.

227. 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.

228. **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.

229. 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 26**.

230. **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 contractor and CMSC. Key responsibilities of the town-level environment specialist are enumerated in **Table 26**.

231. **Contractors.** The contractor will be required to update the IEE and will be responsible for providing final design verification 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 liaison²⁵ consultations with interested/affected people, (iv) field-level grievance redress; and (v) reporting.

232. 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.

233. 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.

234. RUDSICO-EAP will ensure that bidding and contract documents include specific provision requiring Contractors to comply with: (i) all applicable labour laws and core labour standards on

²⁵ 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.

(a) prohibition of child labour 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 labour; and (ii) the requirement to disseminate information on sexually transmitted diseases including HIV/AIDS, to employees and local communities surrounding the project sites.

Table 26: 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 India national, state, and local environmental laws and regulations, (c) core labour 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	(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 (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	Compliance monitoring to review the environmental performance of project component, if required and as specified in EMP

Responsible Agency	Responsibility		
	Pre-Construction Stage	Construction Stage	Post-Construction
	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.		
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 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.	(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 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	(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
Consultant – 1.PMCBC- Environmental Safeguard Specialist – 1 no.	(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 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	(i) Implement EMP. (ii) Implement corrective actions if necessary. (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 labourer 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	(i) Ensure EMP post-construction requirements are satisfactorily complied (ii) Request certification from PIU

Responsible Agency	Responsibility		
	Pre-Construction Stage	Construction Stage	Post-Construction
	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.	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.	

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 27.

Table 27: 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	All staff, ULBs and consultants involved in the project	PMU cost

Sl. No.	Description	Target Participants and Venue	Cost and Source of Funds
	-Government of India and Rajasthan applicable safeguard laws, regulations and policies including but not limited to core labour standards, OH&S, etc. -Incorporation of EMP into the project design and contracts -Monitoring, reporting and corrective action planning	At PMU, Jaipur	
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 labour 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 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 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. Environmental monitoring plan is depicted in **Appendix 6**.

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

Most of the mitigation measures require the contractors to adopt good site practice. 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 28**)

Table 28: Cost Estimates to Implement the EMP

	Particulars	Stages	Unit	Total Number	Rate (INR)	Cost (INR)	Costs Covered By
A.	Mitigation Measures						
1	Compensatory plantation measures*	Construction	per tree	180	4050	729000	Civil works cost
	Subtotal (A)					729000	
B.	Monitoring Measures						
1	Air quality monitoring**	Pre-construction and Construction (quarterly)	per sample	20	4920	98,400	Civil works cost
2	Noise levels monitoring**	Pre-construction and Construction (quarterly)	Per sample	20	1980	39,600	Civil works cost
4.	Ground water Monitoring	Pre-construction and Construction (quarterly)	Per sample	20	6776	134,400	Civil works cost
	Subtotal (B)					272,400	
C.	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 (C)					325,000	
D	Civil Works						
1	Water Sprinkling for dust suppression	Construction	KL	3000	111	333000	Civil works cost
E	Grievance Redressal Mechanism				Lump sum	350000	Civil works cost
	Sub Total (F)					6,83,000	
	Total (A+B+C+D+E+F)				INR	20,09,400	

* In preliminary design about 60 trees may be required to cut. During service improvement Plan contractor will be required to confirm exact number of tree cutting. Tree cutting requirement for proposed drainage works can be decided only after confirmatory survey of full length of alignment by contractor. In this stage higher side of tree cutting numbers are taken as 60 trees. As per RUDSICO-EAP policy; compensatory plantation in the ratio of 1:3 is to be followed during construction works. Therefore 180 numbers of trees are taken as compensatory plantation.

Summary of EMP Cost incurred by Institution:

Contractor Cost	- INR 1734,400/-
PMU Cost	- INR 2,75,000/-
Total	- INR 2,009,400/-

(In Words: Rupees Twenty Lacs Nine Thousand Four Hundred Only)

X. CONCLUSION AND RECOMMENDATION

228. The process described in this document has assessed the environmental impacts of all elements of the Bundi Drainage 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 due to excavation of proposed drains; 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 drains will be constructed. A resettlement plan has been developed in accordance with ADB SPS 2009 and Government of India laws and regulations.

229. To strengthen the existing drainage system of city and to address gaps in the existing system; drainage works is proposed in Bundi city. Under which proposed works Nagar Parishad said that five drains will be rehabilitated, i) Bundi bypass - Rani ji ki Baori - Lanka gate - ICE factory to UIDSMT Nalla: 2.693 km; ii) Khoja gate to ice factory: 0.407 km; iii) Gurudwara Devpura to Nanak Puliya Tiraha: 4.008 km; iv) Jait Sagar to Devpura: 5.900 km; v) Agarwal Dharamshala to highway nalla on Silor road: 1.210 Km; Total length of proposed drainage is 14.118 Km.

230. The subproject is formulated to address gaps in Drainage infrastructure in a holistic and integrated manner. The Project Components include improvements in drainage infrastructures of all Six drains to discharge the storm water into Mangali River and other specific location. to improve the drainage system of the town and to prevent the stagnant water of both the drains.

231. Anticipated impacts of proposed drainage systems during operation and maintenance will be related to check and repair of blocks, overflows and leakages in all five drains. Regular cleaning of drains and safe disposal of removed silt and solid waste from drains are major area of concern during operation phase and mitigation plans are required for same.

232. 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.

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. Total estimated cost for EMP implementation is approx. INR 1,401,400/- (In Words: Rupees Fourteen Lacs One thousand and Four Hundred Only).

233. 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.

234. The project will benefit the general public by contributing to the long-term improvement of Drainage system and community liveability in Bundi. 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.

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

Recommendations.

236. The recommendations to this subproject based on the findings of draft IEE, and updates on the compliance are as follows;

- Include this IEE in bid and contract documents; Complied
- Conduct safeguards induction to the contractor after award of contract; Complied
- Ensure contractor appointed qualified environment, health and safety (EHS) officers prior to start of works; Complied
- Update/revise this IEE based on detailed design and/or if there are unanticipated impacts, change in scope, alignment, or location; Being complied
- Commitment from PMU, PIUs, project consultants, and contractors to protect the environment and the people from any impact during project implementation; Being complied
- Obtain all statutory clearances at the earliest time possible and ensure conditions/provisions are incorporated in the detailed design; Being complied
- Timely disclosure of information and establishment of GRM; Being complied
- Involvement of contractors, including subcontractors, in first level GRM; Complied
- Strictly supervise EMP implementation; Being complied
- Continuous consultations with stakeholders; Being complied
- Urban local body will ensure that no industrial wastewater and sewerage enter in to proposed drains: Will be complied
- Documentation and reporting on a regular basis as indicated in the IEE: Being complied

Appendix 1: REA Check list

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)/Bundi Drainage subproject, Distt. Bundi, Rajasthan
Sector Division: Urban Development

REA Checklist- Urban Development

SCREENING QUESTIONS	Yes	No	REMARKS
A. Project Siting Is the project area...			
Densely populated?	√		Subproject activities are scattered to entire town including the densely populated areas.
Heavy with development activities?	√		Bundi is a developed town with continuous urban expansion, there are several industries and mostly agriculture, business and service are the common occupations
Adjacent to or within any environmentally sensitive areas?		√	There are environmental sensitive areas near the proposed sites. Chambal Gharial Sanctuary is approx. 30 km, Ramgarh Vishdhari 350 m & Jawahar Sagar is almost 27 km from proposed drains components.
Cultural heritage site		√	Bundi town has three state Protected Monuments, Raniji Ki Bawari (step well), 84 Pillared Cenotaph (Shiv temple) and Inscription of Hammir and one ASI monument (Wall Paintings of Hardoti School in the Palace). No project component is located within any cultural heritage site.
Protected Area	√		There are environmental sensitive areas near the proposed sites. Chambal Gharial Sanctuary is approx. 30 km, Ramgarh Vishdhari 350 m & Jawahar Sagar is almost 27 km from proposed drains components.
Wetland		√	
Mangrove		√	
Estuarine		√	
Buffer zone of protected area		√	

SCREENING QUESTIONS	Yes	No	REMARKS
Special area for protecting biodiversity	√		Subproject components are located in Bundi City and in its immediate surroundings which were converted into urban use for many years ago, and there is natural habitat live at few areas and most of the drainages area at distance location from the proposed sites. Nearest protected area is Ramgarh Vishdhari Wildlife Sanctuary is located 350 metres from Bundi on the Bundi-Nainwa road.
Bay		√	
B. Potential Environmental Impacts Will the Project cause...			
Impacts on the sustainability of associated sanitation and solid waste disposal systems and their interactions with other urban services.		√	No such impacts on existing sanitation and solid waste disposal systems
Deterioration of surrounding environmental conditions due to rapid urban population growth, commercial and industrial activity, and increased waste generation to the point that both manmade and natural systems are overloaded and the capacities to manage these systems are overwhelmed?		√	No such impact is anticipated
Degradation of land and ecosystems (e.g. loss of wetlands and wild lands, coastal zones, watersheds and forests)?		√	No impacts on land and ecosystem is anticipated
dislocation or involuntary resettlement of people		√	Project does not involve land acquisition / involuntary resettlement /displacement. During the drain construction, particularly in narrow streets there may be temporary disruption to household and there will also be temporary loss of livelihood to roadside vendors.
Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	No such impact on vulnerable groups
Degradation of cultural property, and loss of cultural heritage and tourism revenues?		√	Subproject components are not proposed within boundary of any cultural heritage monument
Occupation of low-lying lands, floodplains, and steep hillsides by squatters and low-income groups, and their exposure to increased health hazards and risks due to polluting industries?		√	No such impact is anticipated
Water resource problems (e.g. depletion/degradation of available water supply, deterioration for surface and ground water quality, and pollution of receiving waters?		√	No such impact is anticipated rather proposed improvements of both drains will improve the environmental conditions of the city

SCREENING QUESTIONS	Yes	No	REMARKS
Air pollution due to urban emissions?		√	No such impact is anticipated
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 drainage system physical and biological hazards may cause health and safety risks to workers for which mitigation measures will be required
Road blocking and temporary flooding due to land excavation during rainy season?	√		Temporary flooding may occur in excavated trenches during rainy season and mitigation measures will be required to overcome flooding due to construction works
Noise and dust from construction activities?	√		Noise and dust problem may occur during construction activities
Traffic disturbances due to construction material transport and wastes?	√		Traffic disturbances may occur during construction works and traffic management plan will be required
Temporary silt runoff due to construction?	√		Bundi is predominantly dry and rainfall is very limited
Water depletion and/or degradation?		√	No such impact is anticipated
Overpaying of ground water, leading to land subsidence, lowered ground water table, and salinization?		√	No such impact is anticipated
Contamination of surface and ground waters due to sludge disposal on land?	√		Silt and solid waste emerging from cleaning of drains will create such problem if not addressed
Pollution of receiving waters resulting in amenity losses, fisheries and marine resource depletion, and health problems?		√	No such impact is anticipated
Large population influx 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 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 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.

SCREENING QUESTIONS	Yes	No	REMARKS
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, equipment and vehicle operation, construction 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), Bundi Drainage subproject, District - Bundi , Rajasthan

Sector: Urban Development

Subsector: Urban Drainage

Division/Department: SARD/SAUW

Screening Questions		Score	Remarks ²⁶
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 be envisaged in future which likely affect the performance of project output

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1

²⁶ 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.

Very Likely	2
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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 drains and the anticipated environmental impacts are very marginal and the construction activity does not impose any threat to the existing climatic conditions.

Appendix 2: List of ASI and State Protected Monuments in Bundi

A. List of State protected Monuments in Bundi

1.	Raniji Ki Bawari (step well)	Bundi
2.	Shiv Temple	Bundi
3.	Inscription of Hammir	Bundi

B. List of ASI Protected Monuments in Bundi

<u>S.No.</u>	<u>Locality</u>	<u>Name of monument / site</u>
1	Bundi	Wall Paintings of Hardoti School in the Palace

Appendix 3: 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	Will be Complied- Tree cutting will 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 7 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 within the impact area of project components.

	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
Physical Cultural Resources	Should not result in the destruction/damage of or encroachment onto physical cultural resources (PCR) ²⁷ 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.	Being Complied- Wall painting in Palace is about 300 m far in proposed Jait Sagar drain so no prior NOC required from ASI department No other ASI Monuments falls under impact area of any of the component of this project. None of project components falls within the protected areas of any of the state protected monuments. Therefore there will be no adverse impact on any ASI and State protected monuments due to proposed project activity.
Existing Facilities to be rehabilitated or expanded	Conduct environmental audit of existing facilities ³³ per ADB SPS	Not applicable to this sub project
Associated Facilities ²⁸	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,	Avoid handling or removing any ACM. Ensure asbestos concrete (AC) pipes facilities containing asbestos will not be disturbed and left in-situ. Appendix C-20 (of EARF) provides asbestos management plan. RUDSICO shall include AMP in all contracts.	Not applicable to this sub project

²⁷ 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.”

²⁸ 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”

excess pipes stored in PHED campuses, walls, etc.		
	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.	Not applicable to this sub project
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.	Not applicable to this sub project
	Ensure that pipelines ROW do not require land acquisition from individual farmers that is a significant proportion of their total land holding (>10%).	Not applicable to this sub project

Appendix 4: City Level Committee (CLC) meeting and Stakeholder Consultation Conducted During Project Preparation

A. 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-

S. No	Date of Consultation	Name of persons	Location	Topic Discussed	Outcome
1	5 th Jan, 2022	Manish Kumar, Sunil Bhatt, Mohan Lal, Shubhanam, Satnaryan, Suraj Singh, Sonu, Nand Kishor, Jaswant, Manish, Mohit Gujjar, Shubham, Sourabh. M- 12 F- 01	Nawal Sagar; Drainage, Bundi	Status of existing drainage system, Information about project components and feedback about the project, presence of trees at proposed alignment, probable disturbance during construction works, presence of wildlife in drain alignment	All the participants told that prior information of civil works must be shared so that they can shift to the other side of the road. They agreed that this subproject is urgently required for proper drainage in Bundi town. Participants are happy with proposed project. Grievance mechanism and process of loading complaints briefed with participants. There is not any forest, wildlife or any sensitive /unique environmental, component near the project area.
2	5 th Jan, 2022	Madan Lal, Sonu, Kalayaan, Prithviraj, Khaniya, Manav, Mandhir, M- 07 F- 00	Nawal Sagar; Drainage, Bundi	Status of existing drainage system, Information about project components and feedback about the project, presence of trees at proposed alignment, probable disturbance during construction works, presence of wildlife in drain alignment	All the participants told that prior information of civil works must be shared so that they can shift to the other side of the road. They agreed that this subproject is urgently required for proper drainage in Bundi town. Participants are happy with proposed project. Grievance mechanism and process of loading complaints briefed with participants. There is not any forest, wildlife or any sensitive /unique environmental, component near the project area.

S. No	Date of Consultation	Name of persons	Location	Topic Discussed	Outcome
3	5 th Jan, 2022	Dasart, Madhav Prasad, Chintan Nawal, Suresh Nawal, Amit Gautam, Madhanir Garg, Satish, Ramesh, Babu. M- 12 F- 00	Nawal Sagar; Drainage, Bundi	Status of existing drainage system, Information about project components and feedback about the project, presence of trees at proposed alignment, probable disturbance during construction works, presence of wildlife in drain alignment	All the participants told that prior information of civil works must be shared so that they can shift to the other side of the road. They agreed that this subproject is urgently required for proper drainage in Bundi town. Participants are happy with proposed project. Grievance mechanism and process of loading complaints briefed with participants. There is not any forest, wildlife or any sensitive /unique environmental, component near the project area.
4	19 th July, 2022	Ram Pratap, Chetan Rathore, Mathra Lal, Sahid Rahmaan, Mukesh Jain, Nafiz, Hamid. M- 06 F- 0	Jait Sagar Nallah; Bundi	Status of existing drainage system, Information about project components and feedback about the project, presence of trees at proposed alignment, probable disturbance during construction works, presence of wildlife in drain alignment	All the participants told that prior information of civil works must be shared so that they can shift to the other side of the road. They agreed that this subproject is urgently required for proper drainage in Bundi town. Participants are happy with proposed project. Grievance mechanism and process of loading complaints briefed with participants. There is not any forest, wildlife or any sensitive /unique environmental, component near the project area.
5	19 th July, 2022	Abdul Rataif, Skir Hussian, Fajaan, Mohameed Aslam, Eswar, Sor Ansari. M- 6 F- 0	Ward No. 37 & 53; Bundi	Status of existing drainage system, Information about project components and feedback about the project, presence of trees at proposed alignment, probable disturbance during constructionworks, presence of	All the participants told that prior information of civil works must be shared so that they can shift to the other side of the road. They agreed that this subproject is urgently required for proper drainage in Bundi town. Participants are happy with proposed project. Grievance mechanism and process of loading complaints

S. No	Date of Consultation	Name of persons	Location	Topic Discussed	Outcome
				wildlife in drain alignment	briefed with participants. There is not any forest, wildlife or any sensitive /unique environmental, component near the project area.
6	19 th July, 2022	Madan Lal, Kalyaan, Babu Lal, Hira Lal, Ismil Habib, Sonam Goyal, Nand Kishor, Dev ram, Kalesh Sharma, Vimal Bhandari, Jitendar Kumar. M-10 F-01	Khatik Bhwan & Aadarsh Clony; Bundi	Status of existing drainage system, Information about project components and feedback about the project, presence of trees at proposed alignment, probable disturbance during construction works, presence of wildlife in drain alignment	All the participants told that prior information of civil works must be shared so that they can shift to the other side of the road. They agreed that this subproject is urgently required for proper drainage in Bundi town. Participants are happy with proposed project. Grievance mechanism and process of loading complaints briefed with participants. There is not any forest, wildlife or any sensitive /unique environmental, component near the project area.
7	19 th July, 2022	Love Kush, Abdul Salim, Golu, Babu Lal. M-04 F-0	Medical Colny & Chattarpura Village; Bundi.	Status of existing drainage system, Information about project components and feedback about the project, presence of trees at proposed alignment, probable disturbance during construction works, presence of wildlife in drain alignment	All the participants told that prior information of civil works must be shared so that they can shift to the other side of the road. They agreed that this subproject is urgently required for proper drainage in Bundi town. Participants are happy with proposed project. Grievance mechanism and process of loading complaints briefed with participants. There is not any forest, wildlife or any sensitive /unique environmental, component near the project area.
8	20 th July, 2022	Soji Rathore, Ajaad Singh, Jagdish Prashad, Yogesh, Lodesh Partap, Lokesh, Rohit,	Gurudwara to Nanak Puliya; Bundi	Status of existing drainage system, Information about project components and feedback about the project, presence of trees	All the participants told that prior information of civil works must be shared so that they can shift to the other side of the road. They agreed that this subproject is urgently required for

S. No	Date of Consultation	Name of persons	Location	Topic Discussed	Outcome
		Dhurgesh, Nishant Handa, Pooja, Laxsmi Naryana, Moti Ram, Ganesh Lal, Mukesh, Dhararaj Saini, Desh raj Saini, Ram Savroop. M-16 F-0		at proposed alignment, probable disturbance during construction works, presence of wildlife in drain alignment	proper drainage in Bundi town. Participants are happy with proposed project. Grievance mechanism and process of loading complaints briefed with participants. There is not any forest, wildlife or any sensitive /unique environmental, component near the project area.
9	20 th July, 2022	Samile Khan, Aman, Sonu, Fazui, Sonu, Lahin, Sakil Khan. M- 5 F- 2	Gurudwara Devepura; Bundi	Status of existing drainage system, Information about project components and feedback about the project, presence of trees at proposed alignment, probable disturbance during construction works, presence of wildlife in drain alignment	All the participants told that prior information of civil works must be shared so that they can shift to the other side of the road. They agreed that this subproject is urgently required for proper drainage in Bundi town. Participants are happy with proposed project. Grievance mechanism and process of loading complaints briefed with participants. There is not any forest, wildlife or any sensitive /unique environmental, component near the project area.
10	20 th July, 2022	Soji Lal Meena, Nathu Lal, Om Parkash Sharma, Sita RamSharma, Prahlad Meena, Smitra, Golu, Bhupesh, Sunil. M- 7 F- 2	Khoja Gate Ganesh Ji; Bundi	Status of existing drainage system, Information about project components and feedback about the project, presence of trees at proposed alignment, probable disturbance during construction works, presence of wildlife in drain alignment	All the participants told that prior information of civil works must be shared so that they can shift to the other side of the road. They agreed that this subproject is urgently required for proper drainage in Bundi town. Participants are happy with proposed project. Grievance mechanism and process of loading complaints briefed with participants. There is not any forest, wildlife or any sensitive /unique environmental, component near the project area.

S. No	Date of Consultation	Name of persons	Location	Topic Discussed	Outcome
11	20 th July, 2022	Satinder, Mukesh Kumar, Babu Lal, Dev Kumar Rathore, Satyanarayana, Ashok Kumar, Rohit Kumar, Banti, Satyanarayana. M-9 F-0	Near By FCI Godam; Bundi	Status of existing drainage system, Information about project components and feedback about the project, presence of trees at proposed alignment, probable disturbance during construction works, presence of wildlife in drain alignment	All the participants told that prior information of civil works must be shared so that they can shift to the other side of the road. They agreed that this subproject is urgently required for proper drainage in Bundi town. Participants are happy with proposed project. Grievance mechanism and process of loading complaints briefed with participants. There is not any forest, wildlife or any sensitive /unique environmental, component near the project area.

Photographs of Public Consultations



Public Consultation at Medical Colony (Silor road)
drain towards Highway Nallah 200 mtr



Proposed drain from Highway Nallah, Silor road to
Agersen Dharamshala 200 mtr



Public Consultation _ Temple stair near Ambedkar
Circle, Silor road from Agersen Dharamshala



Public Consultation at Devpura for drain.



Public Consultation at Jait Sagar Nallah for drains



Public Consultation at Khoja Ganesh for drain.



Public Consultation FCI Godam Bundi by pass for drains



Public Consultation at Nanakpura for drains



Extended drain length from, Silor road, Agersen Dharamshala to Ambedkar Circle 600 m @ Ambedkar Circle



Public Consultation at Hakimi Masjid for drain



Public Consultation at Khatik Bhawan for drain



Public Consultation at Devpura for drain



Public Consultation at Aadarsh Colony for drain



Public Consultation at Medical Colony for drain



Public Consultation at Chattarpura Village for drain



Public Consultation at ward 37 for drain



Public Consultation at ward 53 for drain



Public Consultation at Gurudwara Devpura for drain

Public Consultation Attendance Sheet

Rajasthan Secondary Town Development Sector Project (RSTDSP-Ph-IV)
Consultations with Stakeholders

Project Town: Bundi Name of Project: Waste water STP
Date: 02/11/22 Place of Consultation: Nawal Singh
Ph

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	Mahesh Kumar		637564354	
2	Sunil Bhat		9376028768	
3	Mohd Lal		9929992002	
4	Siddhant Nodia		8024645478	
5	Satish Patel		9789175307	
6	Sunil Singh		704651120	
7	Nishu Singh		8004346772	
8	Sunil Singh		8203206460	
9	Jaswanth		961042346	
10	Manish		6678853334	
11				

Rajasthan Secondary Town Development Sector Project (RSTDSP-Ph-IV)
Consultations with Stakeholders

Project Town: Bundi Name of Project: Waste water STP
Date: 02/11/22 Place of Consultation: Shilpa
Ph

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	Shilpa			
2	Shilpa			
3	Shilpa		837780692	
4	Shilpa			
5	Shilpa			
6	Shilpa		942401272	
7				
8				
9				

Rajasthan Secondary Town Development Sector Project (RSTDSP- Ph-IV)
Consultations with Stakeholders

Project Town: Bundi Name Of Project: Drainage work
Date: 19/07/22 Place of Consultation: Medical Colony
Chakrapani village to
Ph

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	Shilpa	Shilpa	9107676724	
2	Shilpa (Nodia)	Shilpa	954907942	
3	Shilpa	Shilpa	637786092	
4	Shilpa	Shilpa		
5				

Rajasthan Secondary Town Development Sector Project (RSTDSP- Ph-IV)
Consultations with Stakeholders

Project Town... पुनर्

Name Of Project... उपग्राम

Date... 19/07/22

Place of Consultation... अनूपम अग्र
आदर कीर्ति

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	मदन मीना	मकान		मदन मीना
2	राज कुमार	होटेला		राज कुमार
3	बलराम	मकान	9588201571	बलराम
4	हिरा लाल	मकान	8955967116	हिरा लाल
5	अरुण कुमार	उद्योग	9922231678	अरुण कुमार
6	सोनम सोनम	उद्योग	998540319	सोनम सोनम
7	नरेश कुमार	उद्योग	9024783125	नरेश कुमार
8	देवराज	मकान		देवराज
9	देवराज शर्मा	मकान	995460121	देवराज शर्मा
10	निगम अग्र	मकान		निगम अग्र
11	मिनेश कुमार	मकान	9053535368	मिनेश कुमार

Rajasthan Secondary Town Development Sector Project (RSTDSP- Ph-IV)
Consultations with Stakeholders

Project Town: Ramdev

Name Of Project: Drainage work

Date: 20/07/22

Place of Consultation: Sub-division office

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	सोनी राहुल	डेला	883864656	सोनी राहुल
2	अनवरुद्दीन	शालीक	636798654	अनवरुद्दीन
3	मोहम्मद अली	चालीक	941121735	मोहम्मद अली
4	मोहम्मद	चालीक	968054861	मोहम्मद
5	मोहम्मद अली	E-मोहम्मद	635050823	मोहम्मद
6	मोहम्मद		894908725	मोहम्मद
7	मोहम्मद		7731048928	मोहम्मद
8	मोहम्मद	ड्राफ्ट	972035533	मोहम्मद
9	मोहम्मद अली	ड्राफ्ट	954928854	मोहम्मद अली
10	मोहम्मद	पान	973321464	मोहम्मद
11	मोहम्मद अली	पान	952087538	मोहम्मद अली
12	मोहम्मद अली	पान		मोहम्मद अली
13	मोहम्मद अली	पान	982554414	मोहम्मद अली
14	मोहम्मद	ड्राफ्ट	916791020	मोहम्मद
15	मोहम्मद अली		980324406	मोहम्मद अली
16	मोहम्मद अली		982948054	मोहम्मद अली
17	मोहम्मद अली		99286914	मोहम्मद अली

Rajasthan Secondary Town Development Sector Project (RSTDSP-Ph-IV)
Attendance Sheet of Public Consultation

Project Town: BundiDate: 20/07/2022Name of the project: DousingPlace of consultation: FCI Godan

S.No.	Name and Mobile no.	Occupation and Address	Topics Discussed	Outcome of the consultation	Signature
1	सुनील 93 70506145	शहीद	1. Awareness about the project	Community people in favour of drainage network work.	सुनील
2	सुनील कुमार 93 70506145	शहीद	2. Present status of site/project	" "	सुनील
3	सुनील कुमार 93 20483281	शहीद	3. Status of water supply/ SWM/sewerage in town	" "	सुनील
4	सुनील कुमार 93 20483281	शहीद	4. Requirement of any tree cutting due to project	" "	सुनील
5	सुनील कुमार 93 20483281	शहीद	5. Presence/movement of wild fauna at project town/project sites	" "	सुनील
6	सुनील कुमार 93 20483281	शहीद	6. Whether project is beneficial for citizens and increase citizen's convenience	" "	सुनील
7	सुनील कुमार 93 20483281	शहीद	7. Whether project is causing any livelihood impact to someone	" "	सुनील
8	सुनील कुमार 93 20483281	शहीद	8. Any historical or cultural monuments in town/near project sites	" "	सुनील
9	सुनील कुमार 93 20483281	शहीद	9. Any suggestion about the project	" "	सुनील
10	सुनील कुमार 93 20483281	शहीद	10. Any other relevant information found at site	" "	सुनील

Signature of the person who done consultation: Mani Prasad

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Rajasthan Secondary Town Development Sector Project (RSTDSP-Ph-IV)
Attendance Sheet of Public Consultation

Project Town: BundiDate: 21/07/2022Name of the project: DousingPlace of consultation: Khaga Gate Godanji

S.No.	Name and Mobile no.	Occupation and Address	Topics Discussed	Outcome of the consultation	Signature
1	सुनील कुमार 93 20483281	शहीद	1. Awareness about the project	Community people in favour of the drainage development project.	सुनील
2	सुनील कुमार 93 20483281	शहीद	2. Present status of site/project	" "	सुनील
3	सुनील कुमार 93 20483281	शहीद	3. Status of water supply/ SWM/sewerage in town	" "	सुनील
4	सुनील कुमार 93 20483281	शहीद	4. Requirement of any tree cutting due to project	" "	सुनील
5	सुनील कुमार 93 20483281	शहीद	5. Presence/movement of wild fauna at project town/project sites	" "	सुनील
6	सुनील कुमार 93 20483281	शहीद	6. Whether project is beneficial for citizens and increase citizen's convenience	" "	सुनील
7	सुनील कुमार 93 20483281	शहीद	7. Whether project is causing any livelihood impact to someone	" "	सुनील
8	सुनील कुमार 93 20483281	शहीद	8. Any historical or cultural monuments in town/near project sites	" "	सुनील
9	सुनील कुमार 93 20483281	शहीद	9. Any suggestion about the project	" "	सुनील
10	सुनील कुमार 93 20483281	शहीद	10. Any other relevant information found at site	" "	सुनील

Signature of the person who done consultation: Mani Prasad

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Rajasthan Secondary Town Development Sector Project (RSTDSP-PH-IV)
Attendance Sheet of Public Consultation

Project Town: Bundi

Name of the project: Drainage

Date: 20/07/2022

Place of consultation: Groundwork Deupura

S.No.	Name and Mobile no.	Occupation and Address	Topics Discussed	Outcome of the consultation	Signature
1	2311504 9355446530		1. Awareness about the project	Community Peoples are in favour in drainage development work.	[Signature]
2	उमर 9382347119		2. Present status of site/project		
3	3212121 6250412112		3. Status of water supply/ SWM/sewerage in town	" "	[Signature]
4	श्रीराम		4. Requirement of any tree cutting due to project	" "	[Signature]
5	FA-2W Ramesh 9325353802		5. Presence/movement of wild fauna at project town/project sites	" "	[Signature]
6	1. Akh 9387660666		6. Whether project is beneficial for citizens and increase citizen's convenience	" "	[Signature]
7	Sahil Mishra 9924627091		7. Whether project is causing any livelihood impact to someone	" "	[Signature]
8			8. Any historical or cultural monuments in town/near project sites	" "	[Signature]
9			9. Any suggestion about the project		
10			10. Any other relevant information found at site		

Signature of the person who done consultation: [Signature] Prince

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Rajasthan Secondary Town Development Sector Project (RSTDSP-PH-IV)
Attendance Sheet of Public Consultation

Project Town: Bundi

Name of the project: Drainage

Date: 19/07/2022

Place of consultation: Plot No. 342 Ward 3

S.No.	Name and Mobile no.	Occupation and Address	Topics Discussed	Outcome of the consultation	Signature
1	मनोज कुमार 9376255045	ड्रावर	1. Awareness about the project	Community people are in favour of drainage network development by people.	[Signature]
2	श्रीराम शर्मा 9387779102	ड्रावर	2. Present status of site/project		
3	उमर	ड्रावर	3. Status of water supply/ SWM/sewerage in town	" "	[Signature]
4	मो. अमरेश 9360845102	ड्रावर	4. Requirement of any tree cutting due to project	" "	[Signature]
5	अ. मीर 9355203445	ड्रावर	5. Presence/movement of wild fauna at project town/project sites	" "	[Signature]
6	श्रीराम शर्मा 9312216404	ड्रावर	6. Whether project is beneficial for citizens and increase citizen's convenience	" "	[Signature]
7			7. Whether project is causing any livelihood impact to someone	" "	[Signature]
8			8. Any historical or cultural monuments in town/near project sites		
9			9. Any suggestion about the project		
10			10. Any other relevant information found at site		

Signature of the person who done consultation: [Signature] Prince

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Rajasthan Secondary Town Development Sector Project (RSTDSP-Ph-IV)
Attendance Sheet of Public Consultation

Project Town: Bundi
Date: 11/07/2022

Name of the project: Discharge
Place of consultation: Left Sagar Near by road.

S.No.	Name and Mobile no.	Occupation and Address	Topics Discussed	Outcome of the consultation	Signature
1	<u>2145414</u>	<u>गरीब-गरीब</u>	1. Awareness about the project	<u>POB People care in</u>	<u>Handy</u>
2	<u>गरीब गरीब</u> <u>6376473018</u>	<u>गरीब घर</u>	2. Present status of site/project	<u>Seepage of Sewage</u>	<u>Handy</u>
3	<u>गरीब गरीब</u>	<u>गरीब</u>	3. Status of water supply/ SWM/sewerage in town	<u>Handy</u>	<u>Handy</u>
4	<u>गरीब गरीब</u> <u>9252562350</u>	<u>गरीब</u>	4. Requirement of any tree cutting due to project	<u>Handy</u>	<u>Handy</u>
5	<u>गरीब गरीब</u> <u>9253606972</u>	<u>गरीब</u>	5. Presence/movement of wild fauna at project town/project sites	<u>Handy</u>	<u>Handy</u>
6	<u>गरीब गरीब</u>	<u>गरीब</u>	6. Whether project is beneficial for citizens and increase citizen's convenience	<u>Handy</u>	<u>Handy</u>
7	<u>गरीब गरीब</u> <u>7023231777</u>	<u>गरीब</u>	7. Whether project is causing any livelihood impact to someone	<u>Handy</u>	<u>Handy</u>
8			8. Any historical or cultural monuments in town/near project sites	<u>Handy</u>	<u>Handy</u>
9			9. Any suggestion about the project		
10			10. Any other relevant information found at site		

Signature of the person who done consultation: Handy POB

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B. City Level Committee (CLC) meeting and Stakeholder Consultation Minutes of Meeting:

- 1. City level Stakeholder Committee (CLC) Meeting (dtd. 20.10.2021)-** A town-level City Level Committee (CLC) has been formed in Bundi district by Government orders. City Level Committee meeting was organized during the detailed design stage to which representatives of primary and secondary stakeholders were invited. City Level Stakeholder committee meeting was organized for Bundi in District Head Quarter, Bundi on dtd. 20.10.2021 to discuss the matter of proposed Water supply & Sewerage, Drainage, Road and City Beautification works in Bundi under the chairmanship of District Collector, Bundi. DPR consultants, RUDSICO-EAP officials, PHED officials, Municipal Corporation, Bundi -North and South officials, Bundi Nagar Parishad officials, Water Resource Department, PWD and other invitee members. Proposed scope of works and technology of proposed Water supply & Sewerage, Drainage, Road and City Beautification works in Bundi was discussed in the meeting and approval was given for proposed works by Committee in this meeting. The project was agreed by the committee for further course of action by RUDSICO-EAP. Details of CLC meeting, minutes of meeting are given below-

Municipal Council, Bundi

Date: 20.10.2021

No. 14.6/21/1309

Minutes of City Level Committee Meeting

A City Level Committee meeting held on 20.10.2021 under chairmanship of District Collector, Bundi for finalization of Drainage & other development works in Bundi city under RUIDP Phase-IV

List of Officials, public representative & stock holders, who attended the meeting, is enclosed at Annexure 'A'.

It was initially briefed out that RUIDP will take up Drainage and other development works in Bundi city. It was apprised that the DPRs of proposed works is being prepared by the Consultant M/s Cadcon Consultants, Jaipur engaged by the Municipal Council, Bundi. It will be considered for Phase-IV project. RUIDP has scrutinized the Draft DPRs and suggestions have already been conveyed to consultants for modifications & revision & the estimates are as per RUIDP SOR-2017.

Provisions under the DPR and basic scope of work were briefed to the committee. The tentative cost of DPR is of Rs. 135crs for works proposed under Drainage & other development works. The brief scope of works are as follows:-

1. Augmentation of Bundi RUIDP water supply scheme for demand load of 26 MLD to 34 MLD

Particulars	Proposed works Detail
Upgradation of Intake Well	8.0 MLD
Water Treatment Plant	8.0 MLD
Transmission Main - DI K-9 Pipe Dia ranging from 100mm to 400mm	1.194 Km
Clear Water Reservoir	1 Nos.
OHSR	1 Nos.
Distribution Mains	
HDPE PE -100, PN6, Pipe Dia ranging from 110mm to 400 mm	30.2 Km
House Service Connection (2025)	5038 nos.

2. Development of main roads and Beautification work of crossings in the city area

(A) Works related to developments of CC Roads

S.no.	Road Type	Length (in m)
1.	Category-I (9.0 to upto 15.0 mtr)	1200
2.	Category-II (5.0 to upto 9.0 mtr)	33545
3.	Category-III (3.0 to upto 5.0 mtr)	9110
	Total	43855

Page 1 of 2

- (B) **Works related to Beautification, conservation and bodies**
- Nawalsagar heritage path from Jaipur road Entry Gate to petrol pump Tiraha
 - Development of Petrol Pump Tiraha
 - Development of Ahinsa Circle
 - Construction ENT Gate at Bundi (Jaipur Road)
 - Construction of ENT Gate of Kota Road
 - Conservation of Naru Ki Baori, naagarsagarkund
 - Conservation of City Gates 5 Nos., and provision of Chhatra on circles
3. Remaining work of Sewerage (STP) of capacity 10.5 MLD based on SBR Technology including FSSM
4. Development of NawalSagar Talab and Heritage work.
5. Following drainage work are proposed in town:-

S.no.	Name of Drain	Length(in m)
1	Jaipur Bypass to FCI godam along with Rani ChikiBawadi	2690.00
2	Khoja Gate Ganesh ji to Ice Factory	415.00
3	GurudwaraDevpura to Nanak PuriyaTiraha	2820.00
4	JaitSagarNallah	5800.00
5	Silor Road (Agarwal Dharamshala to highway nalah on Silor road)	610.00
Total		12335.00

Committee decided to approve the detailed project Report the brief of which is mentioned as above.

Meeting ended with vote of thanks to the chair.


Commissioner
Municipal Council, Bundi
No. 145/24/1310 to 1322


District Collector & Chairman CLC
Bundi
Date: 20.10.2021

Copy to the following for information and necessary action:

- PA to MLA, Bundi.
- PA to District Collector & Chairman CLC, Bundi.
- PA to Project Director, RUIDP, Jaipur.
- Chairman, Municipal Council, Bundi.
- Commissioner, Municipal Council, Bundi.
- Additional Project Director, RUIDP, Jaipur.
- Addl. Chief Engineer, RUIDP, Jaipur.
- Addl. Chief Engineer, PWD/PHED, Bundi, Jaipur.
- Senior Town Planner, Town Planning Department, Bundi.
- Principal Medical Officer, Medical and Health Dept. Bundi.
- Superintending Engineer-1, RUIDP, Jaipur.
- Executive Engineer, Municipal Council, Bundi.


Commissioner
Municipal Council, Bundi

Attendance Sheet of CLC Meeting



Office of Additional Chief Engineer, Phase-IV, Jaipur-Zone, Jaipur
 AVS Building, Jawahar Circle, JLN Marg, Jaipur - 302017
 Ph. - 141 2721966 Fax No. 141 2721919
 E-mail: j4.roid@rajasthan.gov.in

ATTENDANCE SHEET of City Level Committee (CLC) meeting, Bundi

Purpose: - Discussion of broad scope of DPR and identification & finalization of Drainage & other development works to be taken up in Bundi under RUIDP Phase IV.

Date of Meeting: - 20th October, 2021 at 5.00 PM

Venue: Meeting Hall, Collectorate, Bundi

S.No.	Name	Designation and Organization	Signature
1.	Shri. Ashok Dogra	Hon'ble MLA, Bundi	
2.	Kumari Renu Jaipal	Collector & District Magistrate, Bundi	
3.	Shri. Madhu Nuwal	Chairman Municipal Council, Bundi	
4.	Sh. Mahaveer Singh	Commissioner, Municipal Council, Bundi	
5.	Sh. Latoor Bhai	Vice-chairman Municipal Council, Bundi	
6.	Shri. Narendra Ajmera	Addl. Chief Engineer, Zone- Jaipur, RUIDP	
7.	VK Jain	SE on behalf of Addl. Chief Engineer, PWD, Bundi	
8.	D.N. Nyan	SE on behalf of Addl. Chief Engineer, PHED, Bundi	
9.		Senior Town Planner, Town Planning Department	
10.		Principal Medical Officer Medical & Health Department	
11.	Anand Singh	2nd Secy. H.E. Bundi	

Stakeholder Consultation and Community Awareness meeting: A Town level Stakeholder Consultation and Community Awareness meeting was held on 24.03.2023 at Collectorate Meeting Hall in Bundi Town, which was attended by District Administration officers, Municipal council officers and elected councillors of the municipal council and other stakeholders. The minutes of meeting are as under.

Rajasthan Secondary Towns Development Sector Project **Community Awareness Program & Stakeholder Consultation**

Title: Stakeholder Consultation on Environment and Social Safeguard.

Venue: Collectorate Meeting hall, Bundi

Date: 24th March 2023

No of Participants: 47 (Male-41, Female-06)

Objectives of Program:

The primary objective of workshop was to create the awareness, through which the people will be sensitized about the benefits of upcoming project in Bundi town along with potential social and environmental impacts and mitigation measures.

Minutes of the Public Awareness & Consultation

Public Awareness Program & Stakeholder Consultation was held on 24.03.2023 at Meeting Hall, Collectorate office, Bundi. Officials of Nagar Palika (Chairman, Councillor), Official of PHED and SDM of Bundi town and local public & Public representative were shown their participation.

Mr. Chiranjilal, Gender Expert of CAPPG, RUIDP, welcomed the distinguished guests and participants.

Mr. Manish Arora, SE, PIU, Bundi in his introductory speech, briefed about the Project Development Objectives (PDO). He explained that newly developed area of Bundi is unable to cater the water demand due to growing population therefore under water supply scheme water treatment plant (WTP), CWR, OHSR, pipeline networks, house service connection etc are considered as per the requirements of the town. He also deliberated that the capacity of existing STP is not enough due to increase of sewer connections, hence additional 6.5 MLD capacity STP is proposed under sewer scheme. SE, PIU also apprised that in low lying areas where the sewerage line is not feasible, Faecal Sludge & Septage Management (FSSM) has been proposed. It was also informed that the project is based on Design Built & Operate (DBO) contract, hence contractor bounded to maintain the created project assets for 10 years.

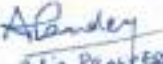
It was also apprised by Mr. Manish Arora, SE, PIU, Bundi that Bundi is an important tourist destination in the state of Rajasthan and there are many tourist sites (Gates, Baoris, Chatirs and Nawal Sagar Kunds).

Therefore, at **Nawal Sagar Lake**- Cleaning of Nawal Sagar Lake intercepting of drain


 (Shrikant Singh)
 Executive Engineer
 E-2025/V/Amra
 RUIDP Ph-IV, Bundi


 Gender Expert
 CAPPG-01 Bundi
 Janta Kalyan


Team Leader
CMSC-01, Ph-IV
RUIDP, Jaipur


G.K. Professional
CMSC-01, Ph-IV

VARDA SRIVASTAVA
ENVIRONMENTAL
SAFEGUARD PROFESSIONAL
CMSC-01 RUIDP-IV JAIPUR

into Nawal Sagar, Enhancing the capacity of Nawal Sagar Lake, Beautification of the two sides of Lake Edge and at **Nawal Sagar Park**- Development of the entrance plaza, Development of the interconnection of three different parks into one, Development of alternate route for the public use, Interconnecting the park and Nawal Sagar lake, redesigning of road between the park and lake into the Promenade, Development of food court, public utilities and parking spaces etc.

The basic objective of this subproject is to improve the economic development by providing the infrastructure and service in the city beautification. The improvement of quality of life and thereby effective contribution of beneficiary people in the economic activity is expected.

Smt. Nishita Arya, Architect, PMCBC briefed about the proposed components through power point presentation to the participants.

Mr. Shrikant Jangir, EE, PIU, apprised that water logging is reported in rainy season in low laying areas of the town due to the lack of proper drainage and discharge resulting rain water comes on the roads and create water logging at various places. Hence for proper drainage and safety discharge of stagnated water and reduce incidences of water logging, improvement of 14.21 Km. existing drain improvement works is proposed for Bundi town under RUIDP project. The drain considered for improvement are: lanka gate - ice factory to UIDSSMT Nallah/drain, From Agarwal Dharamshala to Highway Nallah on Sitor Road, From Khoja Gate to Ice Factory, From Gurudwara Devpura to Nanak bridge circle and from Jait Sagar to Devpura.

Mr. Vardan Srivastava, Environmental Safeguards Professional, CMSC-01, briefed them 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 the 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 location giving information about the duration of closure of works and contractor contact details for grievances, if any.

Mr. Bhupander Kaushik, Social Safeguard Support, PMCBC- RUIDP briefed them about the main features of ADB safeguard policy. He deliberated that works should be undertaken in such a way that impacts should be minimized. If any impacts will be envisaged, specially livelihood, compensation shall be paid as per ADB agreed framework. Grievances mechanism.

Mr. Chiranjit, CAPPC briefed that throughout project, public awareness activities will be carried out to develop the sense of ownership, so project can sustain for a long time through which local residents/people will get benefitted economically, socially


 (Shrikant Jangir)
 Executive Engineer
 BUNDI
 RUIDP PIU - Bundi


 Support Engineer
 CMSC-01 Bundi
 Name: Vardan


 Team Leader
 CMSC-01, Ph-IV
 RUIDP, Jaipur


 S.T. PROFESSIONAL
 CMSC-01, PH-IV

VARDAN SRIVASTAVA
 ENVIRONMENTAL
 SAFEGUARD PROFESSIONAL
 CMSC-01, RUIDP PH-IV

Smt. Madhu Niwai, Chairman of Nagar Parishad stated that it is the responsibility of each participant to facilitate the project implementation team, so works can be executed without any hurdle. Project sustainability depends on the public, so it is also the responsibility of councilors to disseminate information to public in their respective ward to maintain the project assets once the project will be completed.

Mr. Sohan Lal, SDM requested to all the councilors to provide all required support to PIU/CMSC and Contractor for successful completion of proposed work in Bundi town

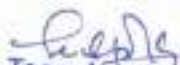
A vote of thanks given by SE, PIU to all the participants for their presence and contribution to an event.


(Shrikant Jangir)
Executive Engineer
CMSC-01, Ph-IV
RUIDP, Bundi


Support Engineer
CMSC-01 Bundi
Jaipur - 302001


VARDAN SRIVASTAVA
ENVIRONMENTAL
SAFEGUARD PROFESSIONAL
CMSC-01, RUIDP-IV, JAIPUR


G+S PROFESSIONAL
CMSC-01, Ph-IV


Team Leader
CMSC-01, Ph-IV
RUIDP, Jaipur

Snapshot



(Signature)
Charvi Singh
Support Engineer
CMSC-01, Ph-IV
RUIDP, Jaipur

(Signature)
Support Engineer
CMSC-01, Bundi
Kota Division

(Signature)
GFS PROFESSIONAL
CMSC-01

(Signature)
VARDAN SRIVASTAVA
ENVIRONMENT
SAFETY & PROTECTION
CMSC-01, Bundi

(Signature)
Team Leader
CMSC-01, Ph-IV
RUIDP, Jaipur

Attendance Sheet



राजस्थान नगरीय आधारभूत विकास परियोजना (RUIDP)

वर्तुथ धरण ट्रेंच -II, PIU, Bundi

दिनांक 24.03.2023

स्थान- जिला कलेक्ट्रेट सभागार, बुन्दी

क्र.सं.	नाम	पद	लिंग (पुरुष/महिला)	संबंधित नम्बर	हस्ताक्षर
1	महेश कुमार	Sub-Engineer	महिला	957774300	महेश कुमार
2	बिजेन्द्र	Sub-Engineer	पुरुष	992867372	बिजेन्द्र
3	SHAMU LAL	SDO Bundi	M	977165798	Se
4	D.N. YAD	SE, PHED	Male	946005690	Se
5	Manish Kishor	SE, RUIDP	M	8003277650	Manish
6	Deepak K. Sharma	SE/ABD Bundi	M	9410052004	Deepak
7	Shrikant Jangir	SE (RUIDP)	M	803868316	Shrikant
8	Nisha Arora	SE (RUIDP)	F	99116222	Nisha Arora
9	Sandeep Singh Negi	Environmental Engineer	M	9876358108	Sandeep
10	Chandrasekhar Singh	Structural Engineer	M	939748460	Chandrasekhar
11	TANISHA MOHANTHAN	PROJECT RECORDS	M	9797833972	TANISHA
12	Sandeep	SE/ABD Bundi	M	961911000	Sandeep

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SRINIVASTAVA
G.S. PROFESSIONAL
CMSC-01, Ph-IV

SRINIVASTAVA
F. ENVIRONMENTAL
G.S. PROFESSIONAL
CMSC-01, Ph-IV



राजस्थान नगरीय आधारभूत विकास परियोजना (RUIDP)

कृषि वन ट्रैव -II, PIU, Bundi

दिनांक 24.05.2023

स्थान- जिला बलेसरुट सभागार, बुन्दी

क्र.सं.	काम	प्रकार	मिटर ट्रैव/मीटर	वेबसाइट नम्बर	हस्ताक्षर
1	Expenditure	Expenditure	10	9522241130	OK
2	Job Order	Job Order	10	9522241130	OK
3	Job Order	Suppl by	10	9522241130	OK
4	Job Order	Suppl by	10	9522241130	OK
5	Job Order	Suppl by	10	9522241130	OK
6	Job Order	Suppl by	10	9522241130	OK
7	Job Order	Suppl by	10	9522241130	OK
8	Job Order	Suppl by	10	9522241130	OK
9	Job Order	Suppl by	10	9522241130	OK
10	Job Order	Suppl by	10	9522241130	OK
11	Job Order	Suppl by	10	9522241130	OK
12	Job Order	Suppl by	10	9522241130	OK
13	Job Order	Suppl by	10	9522241130	OK
14	Job Order	Suppl by	10	9522241130	OK
15	Job Order	Suppl by	10	9522241130	OK
16	Job Order	Suppl by	10	9522241130	OK
17	Job Order	Suppl by	10	9522241130	OK
18	Job Order	Suppl by	10	9522241130	OK
19	Job Order	Suppl by	10	9522241130	OK
20	Job Order	Suppl by	10	9522241130	OK

(Shrikant Jangir)
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Executive Engineer
RUIDP, PIU, Bundi

Executive Engineer
RUIDP, PIU, Bundi
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ABANDER
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VARDAN SRIVASTAVA
ENVIRONMENTAL
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CMSC-01, RUIDP, Jaipur



राजस्थान नगरीय आधारभूत विकास परियोजना (RUIDP)

वर्धन जल ट्रेंड -II, PIU, Bundi

दिनांक 24.03.2023

स्थान- जिला जलकट्टे सभाघर, बुन्दी

क्र.सं.	नाम	पद	लिंग पुरुष/महिला	संघर्षित नम्बर	हस्ताक्षर
1	श्री. राजेश कुमार	सी.ई.ओ.	पुरुष	8440800755	
2	श्री. राजेश कुमार	प्रा.स.प्रा.	पुरुष	8440800755	
3	श्री. राजेश कुमार	प्रा.स.प्रा.	पुरुष	8440800755	
4	श्री. राजेश कुमार	प्रा.स.प्रा.	पुरुष	8440800755	
5	श्री. राजेश कुमार	प्रा.स.प्रा.	पुरुष	8440800755	
6	श्री. राजेश कुमार	प्रा.स.प्रा.	पुरुष	8440800755	
7	श्री. राजेश कुमार	प्रा.स.प्रा.	पुरुष	8440800755	
8	श्री. राजेश कुमार	प्रा.स.प्रा.	पुरुष	8440800755	
9	श्री. राजेश कुमार	प्रा.स.प्रा.	पुरुष	8440800755	
10	श्री. राजेश कुमार	प्रा.स.प्रा.	पुरुष	8440800755	
11	श्री. राजेश कुमार	प्रा.स.प्रा.	पुरुष	8440800755	
12	श्री. राजेश कुमार	प्रा.स.प्रा.	पुरुष	8440800755	
13	श्री. राजेश कुमार	प्रा.स.प्रा.	पुरुष	8440800755	
14	श्री. राजेश कुमार	प्रा.स.प्रा.	पुरुष	8440800755	
15	श्री. राजेश कुमार	प्रा.स.प्रा.	पुरुष	8440800755	
16	श्री. राजेश कुमार	प्रा.स.प्रा.	पुरुष	8440800755	
17	श्री. राजेश कुमार	प्रा.स.प्रा.	पुरुष	8440800755	
18	श्री. राजेश कुमार	प्रा.स.प्रा.	पुरुष	8440800755	
19	श्री. राजेश कुमार	प्रा.स.प्रा.	पुरुष	8440800755	
20	श्री. राजेश कुमार	प्रा.स.प्रा.	पुरुष	8440800755	

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A Pandey
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VARUN SRIVASTAVA
ENVIRONMEN
SAFEGUARD PROF
CMSC-01 RUIDP Ph-IV

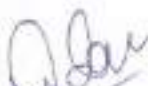
Transcript

Attendance Sheet

Name of participant	Designation
1. Smt. Madhu Nuwal	Chairperson, Municipal Council, Bundi
2. Mr. Mahender	Vice- Chairman, Municipal Council, Bundi
3. Mr. Sohan Lal	Sub-Division Officer
4. Mr. D. N. Vyas	Superintending Engineer, PHED, Bundi
5. Mr. Manish Arora	Superintending Engineer
6. Mr. Shrikant Jangid	Executive Engineer
7. Mr. Dilip Kr. Sharma	Executive Engineer, PHED, Bundi
8. Mr. Manish Kumar Meena	Executive Engineer, PWD, Bundi
9. Smt. Nishita Ariya	Sr. Architect, PMCBC, Jaipur
10. Mr. Surender Singh	Environmental Safeguard Specialist, PMCBC
11. Ms. Bhupander kaushik	Social Safeguard Support, PMCBC
12. Mr. Sandeep Pandey	CAPPC
13. Mr. Anil Kumar Pandey	G & S Prof. CMSC -01
14. Mr. Chinrangi Lal Chandel	CAPPC
15. Ms. Tahir Mir	Project Coordinator
16. Mr. Sameer	Ward Councilor
17. Mr. Rais	Ward Councilor
18. Mr. Hari Shankar Saini	Ward Councilor
19. Mr. Ranjeet Nayak	Ward Councilor
20. Mr. Santosh Kumar	P.R.O.
21. Mr. Sandhya Rawal	Ward Councilor
22. Ms. Mamta Sharma	Ward Councilor
23. Ms. Mahaveer Singh	Ward Councilor
24. Ms. Mohinudeen	Ward Councilor
25. Mr. Pradeep Kumar Jha	Team Leader, CMSC-01, Jaipur
26. Mr. Vardan Shrivastava	Environmental Safeguards Professional, CMSC-01, Jaipur
27. Mr. Mukesh Madhvari	Opposition Leader
28. Mr. Lokesh Dadhich	Shahar Upadhyaksh BJP
29. Mr. Rajendra Kumar Varma	Eng. KIPL
30. Mr. Lal Singh	Site InCh. KIPL
31. Mr. Kapil Soni	Support Eng. CMSC - 01
32. Mr. Manoj Sharma	KIPL
33. Mr. N. K. Trivedi	KIPL
34. Mr. Lalit Trivedi	KIPL
35. Mr. Eshvarya Meena	Eng.
36. Mr. Sandeep Morya	Site Engg.
37. Mr. Bheru Lal	Engg.
38. Mr. Sandeep Mahajan	Trainee.
39. Mr. Ashok Kumar Prajapat	Eng.
40. Mr. Sanchit Agrawal	CA
41. Ms. Mukesh Saini	Ward Councilor
42. Mr. Dashraj Nayak	Ward Councilor
43. Mr. Ramraj Jmera	Ward Councilor


(Shrikant Jangid)
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Team Leader
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RUIDP, Jaipur


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SAFEGUARDS PROFESSIONAL
CMSC-01 Bundi
02.05.2019

Appendix 5: Photographs of Proposed Component Locations

1. Silor Road (Agarwal Dharamshala to Highway Nallah, Silor Road)

Existing Length – 0.6 Km

Extension Proposed – 0.61 Km

Total Length – 1.210 Km

End point Medical Colony to Highway Nallah (300 m)



End point Medical Colony (Silor road) drain from Highway Nallah 300 mtr



End point Medical Colony (Silor road) drain towards Highway Nallah via- Agarwal Dharam Shala) 300 mtr



From Medical Colony (Silor road) drain towards Highway Nallah via Agarwal Dharam Shala) 200 mtr



From Medical Colony (Silor road) drain towards Highway Nallah via Agarwal Dharam Shala) 100 mtr



Public Consultation at Medical Colony (Silor road) drain towards Highway Nallah 200 mtr



Starting point from Highway Nallah to Medical Colony (Silor road) drain

Highway Nallah to Agarwal Dharam Shaala (600 m)



Proposed drain Starting point from Highway Nallah near Medical Colony (Silor road) towards Agarwal Dharam Shala) 000 mtr



Proposed drain from Highway Nallah, Silor road to Agarwal Dharamshala 200 mtr



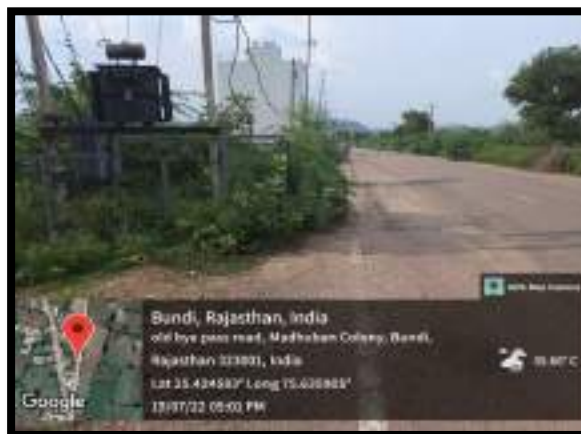
Proposed drain from Highway Nallah, Silor road to Agarwal Dharamshala 200 mtr crossing road



Public Consultation Proposed drain from Highway Nallah, Silor road to Agarwal Dharamshala 200 mtr



Proposed drain from Highway Nallah, Silor road to Agarwal Dharamshala 300 mtr



Proposed drain from Highway Nallah, Silor road to Agarwal Dharamshala 450 mtr



Proposed drain from Highway Nallah, Silor road to Agarwal Dharamshala 450 mtr-



Proposed drain from Highway Nallah, Silor road to Agarwal Dharamshala 500 mtr



Proposed drain from Highway Nallah, Silor road to Agersen Dharamshala 600 mtr at Agarwal Dharamshala



Proposed drain from Highway Nallah, Silor road to Agarwal Dharamshala 600 mtr @ Agarwal Dharamshala-

Agarwal Dharamshala to Ambedkar Circle (600 m) – Extension Proposed



Extended drain length from, Silor road, Agersen Dharamshala to Ambedkar Circle 100 m



Extended drain length from, Silor road, Agersen Dharamshala to Ambedkar Circle 200 m



Extended drain length from, Silor road, Agersen Dharamshala to Ambedkar Circle 400 m



Extended drain length from, Silor road, Agersen Dharamshala to Ambedkar Circle 500 m



Temple stair near Ambedkar Circle, Silor road from Agersen Dharamshala



Temple stair near Ambedkar Circle, Silor road from Agersen Dharamshala



Public Consultation _ Temple stair near Ambedkar Circle, Silor road from Agersen Dharamshala



Extended drain length from, Silor road, Agersen Dharamshala to Ambedkar Circle 500 m-

2. Gurudwara Devpura to Nanak Puliya Tiraha Drain

Existing Length – 2.0 Km
 Extension Proposed – 2.08 Km
Total Length – 4.008 Km

Starting point from Circuit House to Gurudwara – 700 m



Starting point from Circuit House (V.K. Jain House) to Gurudwara 0.000 mtr out of 700 m.



Starting point from Circuit House to Gurudwara 100.000 mtr out of 700 m



Starting point from Circuit House to Gurudwara 300.000 mtr out of 700 m



Starting point from Circuit House to Gurudwara 400.000 mtr out of 700 m



Starting point from Circuit House to Gurudwara 600.000 mtr out of 700 m @ Government college



Starting point from Circuit House to Gurudwara 600.000 mtr out of 700 m @ Government college-



Starting point from Circuit House to Gurudwara
650.000 mtr out of 700 m existing brick drain
started from here



End point from Circuit House to Gurudwara 700
mtr out of 700 m @ Gurudwara

Starting point from Gurudwara to Nanakpura Tiraha @ Gurudwara – 2 Km.



Starting point from Gurudwara to Nanakpura
Tiraha 000 mtr @ Gurudwara



Starting from Gurudwara to Nanak Tiraha 100 m
away



Starting from Gurudwara to Nanak Tiraha 200 m
away

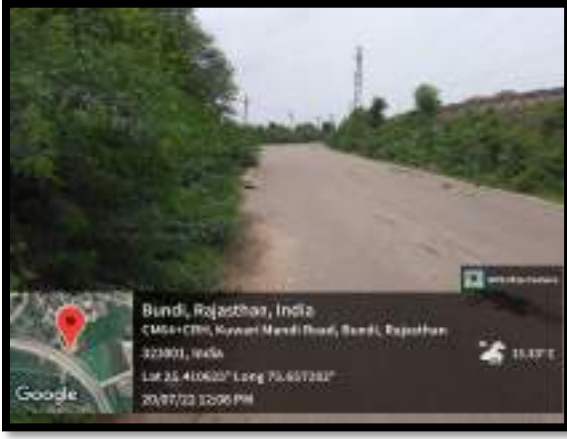


Starting from Gurudwara to Nanak Tiraha 250 m
away

	
Starting from Gurudwara to Nanak Tiraha 300 m away	Starting from Gurudwara to Nanak Tiraha 500 m away
	
Starting from Gurudwara to Nanak Tiraha 600 m away	Starting from Gurudwara to Nanak Tiraha 800 m away
	
Starting from Gurudwara to Nanak Tiraha 900 m away	Starting from Gurudwara to Nanak Tiraha 1100 m away

 Bundi, Rajasthan, India CM93+PCC, Bundi, Rajasthan 323001, India Lat 25.419026° Long 75.65579° 20/07/22 11:27 AM	 Bundi, Rajasthan, India CM93+3Q7, Bundi Rd, Deopara, Bundi, Rajasthan 323001, India Lat 25.41702° Long 75.655642° 20/07/22 11:29 AM
Starting from Gurudwara to Nanak Tiraha 1300 m away	Starting from Gurudwara to Nanak Tiraha 1500 m away (Brick drain finished)
 Bundi, Rajasthan, India CM84+P2M, Bundi, Rajasthan 323001, India Lat 25.410027° Long 75.655109° 20/07/22 11:32 AM	 Bundi, Rajasthan, India Reta Road, Deopara, CM84+557, Bundi, Rajasthan 323001, India Lat 25.41409° Long 75.655481° 20/07/22 11:35 AM
Starting from Gurudwara to Nanak Tiraha 1700 m away	Starting from Gurudwara to Nanak Tiraha 1800 m away
 Bundi, Rajasthan, India CM84+Q75, Bundi Rd, Deopara, Bundi, Rajasthan 323001, India Lat 25.414594° Long 75.655460° 20/07/22 11:40 AM	 Bundi, Rajasthan, India RAJAWAR STATION TIRAHA, Bundi, Rajasthan 323001, India Lat 25.413331° Long 75.655806° 20/07/22 11:44 AM
Starting from Gurudwara to Nanak Tiraha 1900 m away	End point from Gurudwara to Nanak Tiraha 2000 m away @ Nanak Tiraha

Starting from Nanak Tiraha to Nanakpura village - 1.5 Km. Extended

	
Starting from Nanak Tiraha 000 m out of 1.5 Km. Extended part ending at Nanakpura village	Starting from Nanak Tiraha 100 m away out of 1.5 Km. Extended part ending at Nanakpura village
	
Starting from Nanak Tiraha 300 m away out of 1.5 Km. Extended part ending at Nanakpura village-	Starting from Nanak Tiraha 300 m away out of 1.5 Km. Extended part ending at Nanakpura village
	
Starting from Nanak Tiraha 500 m away out of 1.5 Km. Extended part ending at Nanakpura village	Starting from Nanak Tiraha 700 m away out of 1.5 Km. Extended part ending at Nanakpura village

	
Starting from Nanak Tiraha 950 m away out of 1.5 Km. Extended part ending at Nanakpura village	Starting from Nanak Tiraha 1300 m away out of 1.5 Km. Extended part ending at Nanakpura village
	
End point @ Nanakpura village from Nanak Tiraha 1500 m out of 1.5 Km. Extended part ending at Nanakpura village	Public Consultation at Devpura for drains/ road.
	
Public Consultation at Devpura for drains/ road.	Public Consultation at Devpura for drains/ road.

	
Public Consultation at Devpura for drains/ road.	Public Consultation at Nanakpura for drains/ road.

3. Jait Sagar Nallah (Jait Sagar to Devpura Drain)

Existing Length - 3.5 Km.
 Extension Proposed - 2.4 Km.
Total Length - 5.9 Km.

	
Jait Sagar to Devpura Drain Ending at Devpura	Extended drain from Devpura to Nanakpura village 2.5 Km



Extended drain from Devpura to Nankpura village about 2.5 km. Ending point at Nanakpura village



Jait Sagar Drain _ Coming from Jait Sagar Talab



Jait Sagar Drain _ going towards Devpura to Nanakpulia @ Mahaveer Colony

4. Bundi Bypass to FCI Godam along with Rani Ji Ki Bawadi (Total Length- 2.69 Km)



Ice Factory to Khoja Gate, Rani Ji Ki Bawdi, Bundi- Starting point



Ice Factory to Khoja Gate, Rani Ji Ki Bawdi, Bundi -@ 100 m



Ice Factory to Khoja Gate, Rani Ji Ki Bawdi, Bundi- @200m



Ice Factory to Khoja Gate, Rani Ji Ki Bawdi, Bundi-@300m



Ice Factory to Khoja Gate, Rani Ji Ki Bawdi, Bundi- @ UIDSMT End Point

5. Khoja Gate Ganesh Ji to Ice Factory (Total Length- 0.40 Km)



Ice Factory to Khoja Gate, Rani Ji Ki Bawdi, Bundi- Starting Point



Ice Factory to Khoja Gate, Rani Ji Ki Bawdi, Bundi- @ 100 m



Ice Factory to Khoja Gate, Rani Ji Ki Bawdi, Bundi- @ 200 m



Ice Factory to Khoja Gate, Rani Ji Ki Bawdi, Bundi- @ UIDSMT End Point

Appendix 6: Environmental Monitoring Plan - Ambient Air, Noise, Water and Soil

1. Under RSTDSP works Environmental Monitoring will be done for ambient air, noise, and Ground water quality with following parameters-

- A. Ambient Air Quality-** Particulate Matters PM_{10} , Particulate Matter $PM_{2.5}$, SO_x , NO_x , Carbon Monoxide (CO) as per methods and norms approved by CPCB
- B. Ambient Noise Quality-** L_{day} and L_{night} (in Leq dBA) 24 hrs basis as per methods and norms approved by CPCB

2. During pre-construction stage monitoring is required to establish baseline at following sites-

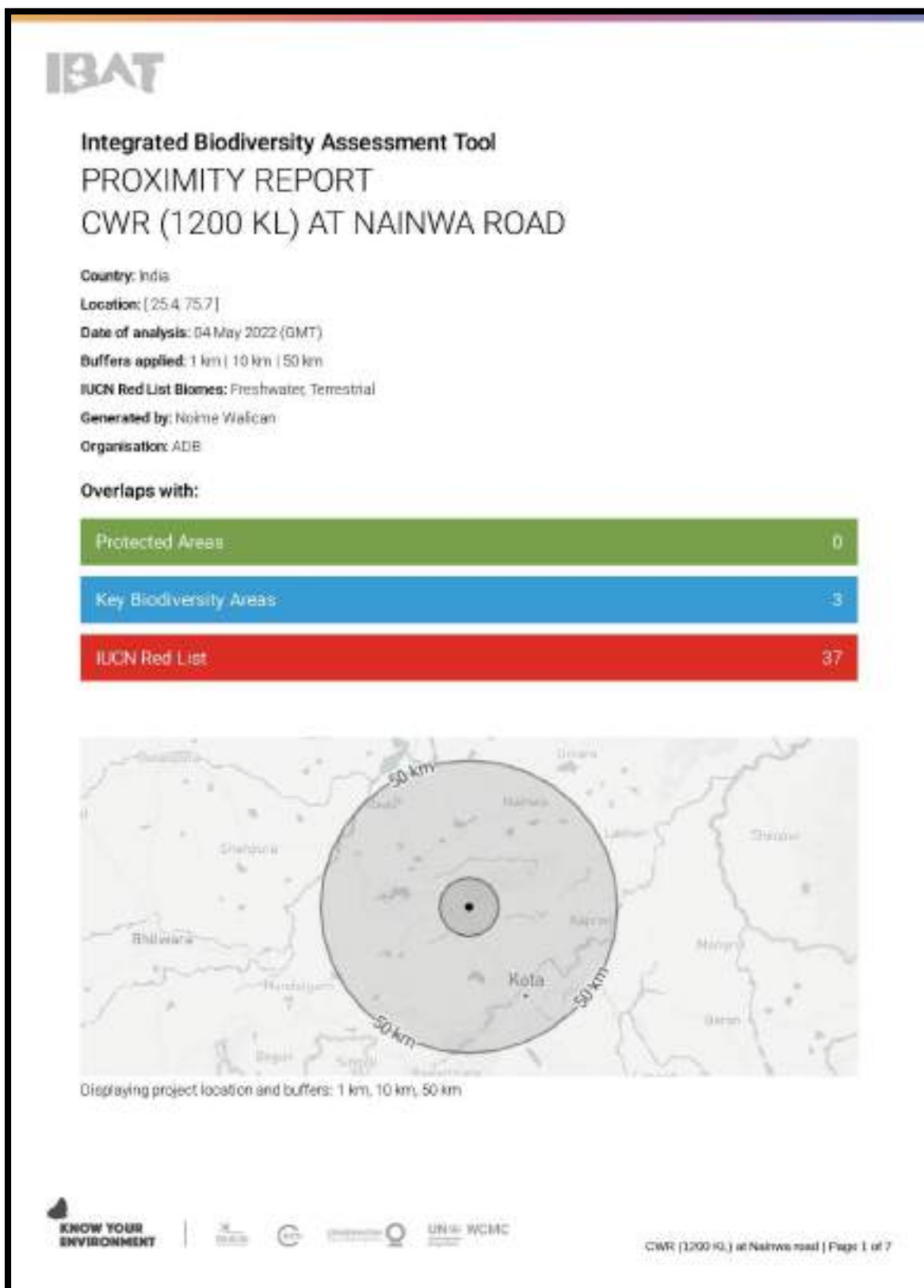
Environmental Monitoring Locations and required samples

S.N.	Type of monitoring	Location of monitoring and no. of samples	Total No. of samples
1	Ambient Air Monitoring	Bundi Bypass Nala, Jait Sagar nala	20
2.	Ambient Noise monitoring	Bundi Bypass, Jait Sagar nala	20
3	Ground Water Monitoring	Bundi Bypass, Jait Sagar nala	20

Note -

- i. All the tests should be done by labs approved by CPCB and/or RSPCB and should be accredited by NABL
 - ii. All the tests should be done as per the norms and methods approved by CPCB/RSPCB
 - iii. All the meteorological data like weather, wind, location, nearby features etc. should be recorded during sampling and indicated in the report for ambient air quality
 - iv. For air quality monitoring, if any two sites are within the distance of 2 km from each other, only one sampling can be done at any site
- * Sensitive receptors are hospitals, schools, any major religious place etc

Appendix 7: Integrated Biodiversity Assessment Report (IBAT analysis) for CWR (1200 KL) at Nainwa road in Bundi





About this report

This report presents the results of [6274-30211] proximity analysis to identify the biodiversity features and species which are located within the following buffers: 1 km, 10 km, 50 km.

This report is one part of a package generated by IBAT on 04 May 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 - May 2022.
- BirdLife International (on behalf of the KBA Partnership), 2022. Key Biodiversity Areas - April 2022.
- IUCN, 2021. IUCN Red List of Threatened Species - December 2021.
- 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., Iribarren, 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>



Protected Areas

The following protected areas are found within 1 km, 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 1 km, 10 km, 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Distance
Bardha Dam	50 km
Jawahar Sagar Sanctuary	50 km
Ramsagar Lake	50 km

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
<i>Ardeotis nigriceps</i>	Great Indian Bustard	AVES	CR	Decreasing	Terrestrial
<i>Sypheotides indicus</i>	Lesser Frigatebird	AVES	CR	Decreasing	Terrestrial
<i>Vanellus gregarius</i>	Sociable Lapwing	AVES	CR	Decreasing	Terrestrial
<i>Gyps bengalensis</i>	White-rumped Vulture	AVES	CR	Decreasing	Terrestrial



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Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
<i>Sarcogyps calvus</i>	Red-headed Vulture	AVES	CR	Decreasing	Terrestrial
<i>Gyps indicus</i>	Indian Vulture	AVES	CR	Decreasing	Terrestrial
<i>Nilssonis gangetica</i>	Indian Softshell Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
<i>Platanista gangetica</i>	South Asian River Dolphin	MAMMALIA	EN	Unknown	Freshwater
<i>Rynchops albicollis</i>	Indian Skimmer	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Sterna acuticauda</i>	Black-bellied Tern	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Haliaeetus leucoryphus</i>	Pallas's Fish-eagle	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Neophron percnopterus</i>	Egyptian Vulture	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Falco cherrug</i>	Saker Falcon	AVES	EN	Decreasing	Terrestrial, Marine, Freshwater
<i>Leptoptilos dubius</i>	Greater Adjutant	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Manis crassicaudata</i>	Indian Pangolin	MAMMALIA	EN	Decreasing	Terrestrial
<i>Varanus flavescens</i>	Yellow Monitor	REPTILIA	EN	Decreasing	Terrestrial
<i>Aquila nipalensis</i>	Steppe Eagle	AVES	EN	Decreasing	Terrestrial



Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
<i>Crocodylus palustris</i>	Mugger	REPTILIA	VU	Stable	Terrestrial, Freshwater
<i>Lutrogale perspicillata</i>	Smooth-coated Otter	MAMMALIA	VU	Decreasing	Terrestrial, Marine, Freshwater
<i>Wallago attu</i>		ACTINOPTERYGII	VU	Decreasing	Freshwater
<i>Bagarius yarrelli</i>		ACTINOPTERYGII	VU	Decreasing	Freshwater
<i>Aythya fennia</i>	Common Pochard	AVES	VU	Decreasing	Terrestrial, Marine, Freshwater
<i>Columba eversmanni</i>	Yellow-eyed Pigeon	AVES	VU	Decreasing	Terrestrial, Freshwater
<i>Grus antigone</i>	Sarus Crane	AVES	VU	Decreasing	Terrestrial, Freshwater
<i>Sterna aurantia</i>	River Tern	AVES	VU	Decreasing	Terrestrial, Marine, Freshwater
<i>Clanga clanga</i>	Greater Spotted Eagle	AVES	VU	Decreasing	Terrestrial, Freshwater
<i>Aquila rapax</i>	Tawny Eagle	AVES	VU	Decreasing	Terrestrial, Freshwater
<i>Issemys punctata</i>	Indian Flapshell Turtle	REPTILIA	VU	Decreasing	Terrestrial, Freshwater
<i>Xenochrophis cereasogaster</i>	Painted Keelback	REPTILIA	VU	Decreasing	Freshwater
<i>Melursus ursinus</i>	Sloth Bear	MAMMALIA	VU	Decreasing	Terrestrial



Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
<i>Panthera pardus</i>	Leopard	MAMMALIA	VU	Decreasing	Terrestrial
<i>Tetracerus quadricornis</i>	Four-horned Antelope	MAMMALIA	VU	Decreasing	Terrestrial
<i>Geochelone elegans</i>	Indian Star Tortoise	REPTILIA	VU	Decreasing	Terrestrial
<i>Rusa unicolor</i>	Sambar	MAMMALIA	VU	Decreasing	Terrestrial
<i>Saara hardwickii</i>	Indian Spiny-tailed Lizard	REPTILIA	VU	Decreasing	Terrestrial
<i>Saxicola macrotynchus</i>	White-browed Bushchat	AVES	VU	Decreasing	Terrestrial
<i>Oryza malampuzhaensis</i>		LILIOPSIDA	VU	Decreasing	Terrestrial



Recommended citation

IBAT Proximity Report. Generated under licence 6274-30211 from the Integrated Biodiversity Assessment Tool on 04 May 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.





Integrated Biodiversity Assessment Tool

World Bank Group Biodiversity Risk Screen

CWR (1200 KL) AT NAINWA ROAD

- **Country:** India
- **Location:** [25.4, 75.7]
- **IUCN Red List Biomes:** Freshwater Terrestrial
- **Created by:** Noime Walican

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: 3	3
Alliance for Zero Extinction (AZE)	1 km: 0	10 km: 0	50 km: 0	0
IUCN Red List	17			
Critical Habitat	Likely			



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



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





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.

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 known or 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
<i>Nilssonia gangetica</i>	Indian Softshell Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
<i>Platanista gangetica</i>	South Asian River Dolphin	MAMMALIA	EN	Unknown	Freshwater
<i>Rynchops albicollis</i>	Indian Skimmer	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Sterna acuticauda</i>	Black-bellied Tern	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Haliaeetus leucoryphus</i>	Pallas's Fish-eagle	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Neophron percnopterus</i>	Egyptian Vulture	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Falco cherrug</i>	Saker Falcon	AVES	EN	Decreasing	Terrestrial, Marine, Freshwater
<i>Leptoptilos dubius</i>	Greater Adjutant	AVES	EN	Decreasing	Terrestrial, Freshwater



Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
<i>Ardeotis nigriceps</i>	Great Indian Bustard	AVES	CR	Decreasing	Terrestrial
<i>Sypheotides indicus</i>	Lesser Florican	AVES	CR	Decreasing	Terrestrial
<i>Vanellus gregarius</i>	Sociable Lapwing	AVES	CR	Decreasing	Terrestrial
<i>Gyps bengalensis</i>	White-rumped Vulture	AVES	CR	Decreasing	Terrestrial
<i>Sarcogyps calvus</i>	Red-headed Vulture	AVES	CR	Decreasing	Terrestrial
<i>Gyps indicus</i>	Indian Vulture	AVES	CR	Decreasing	Terrestrial
<i>Manis crassicaudata</i>	Indian Pangolin	MAMMALIA	EN	Decreasing	Terrestrial
<i>Varanus flavescens</i>	Yellow Monitor	REPTILIA	EN	Decreasing	Terrestrial
<i>Aquila nipalensis</i>	Steppe Eagle	AVES	EN	Decreasing	Terrestrial

Restricted Range Species

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





Biodiversity features which are likely to trigger Critical Habitat

Protected Areas

There are no protected areas to show for this report.

Key Biodiversity Areas

The following key biodiversity areas are found within 1 km and 10 km and 50 km of the area of interest. For further details please refer to the associated csv file in the report folder.

Area name	Distance	IBA	AZE	Recommendation
Bardha Dam	50 km	Yes	No	 Assess for critical habitat
Jawahar Sagar Sanctuary	50 km	Yes	No	 Assess for critical habitat
Ramsagar Lake	50 km	Yes	No	 Assess for critical habitat

Species with potential to occur

Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
REPTILIA	52	7	0	2	5	3	41	1
MANIMALIA	62	7	0	2	5	4	51	0
AVES	308	20	6	7	7	14	274	0
ACTINOPTERYGII	34	2	0	0	2	2	29	1
AMPHIBIA	9	0	0	0	0	0	9	0
INSECTA	50	0	0	0	0	0	48	2



Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
GASTROPODA	23	0	0	0	0	0	22	1
POLYPODIOPSIDA	2	0	0	0	0	0	2	0
MAGNOLIOPSIDA	38	0	0	0	0	0	37	1
LILIOPSIDA	48	1	0	0	1	0	45	2
BIVALVIA	10	0	0	0	0	0	10	0
MALACOSTRACA	5	0	0	0	0	0	5	0
ARACHNIDA	1	0	0	0	0	0	1	0



Recommended citation

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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 8: Environmental Monitoring Report; Pre-construction Phase

Pre-construction environmental monitoring has been conducted by contractor at different working site locations and submitted their environmental monitoring report on dated 04.05.2023. All environmental monitoring parameters meet out CPCB&CC guideline and come under environmental standard permissible limit. Following are the environmental monitoring reports:-

1. Ambient Air Samples Test Report

SKS Test Labs Private Limited		HSE & CC Recognised ISO 9001 ISO 14001 ISO 45001		TC 4052	
Test Report					
Sample Number: SKS/001		Report No: SKS/A/2304240006/A			
Name & Address of the Party: M/s RQI - RBPL JV 175, Raja Chakrasarm Colony, Chulapur, Bundi (Rajasthan)		Format No: 7.8 F-01			
		Party Reference No: Nil			
		Report Date: 04/05/2023			
		Period of Analysis: 24/04/2023-04/05/2023			
		Receipt Date: 24/04/2023			
Sample Description: Ambient Air					
General Information					
Sampling Location		: Rotching Plant Near Meera Road			
Sample Collected by		: SKS Team (Mr. Ramesh katarja)			
Sampling Equipment used		: ADS999B			
Instrument Code		: SKS/ADS999B/0303			
Instrument Calibration Status		: Calibrated			
Latitude		: 25°25'37"			
Longitude		: 75°32'4"			
Meteorological condition during monitoring		: Clear Sky			
Date of Monitoring		: 23/04/2023 To 24/04/2023			
Time of Monitoring		: 11:40 Hrs to 11:40 Hrs			
Ambient Temperature (°C)		: Min. 34°C, Max. 40°C			
Surrounding Activity		: Human, Vehicular & Other Activities			
Scope of Monitoring		: Regulatory Required			
Sampling & Analysis Protocol		: SKS-STP/AA/01			
Sampling Duration		: 24 Hrs.			
Parameter Required		: As Per Work Order			
S. No.	Parameters	Test Method	Results	Units	NAQS 2009
1	Particulate Matter (as PM -10)	IS: 5182 (P-23) : 2006	98.98	µg/m ³	100
2	Particulate Matter (as PM 2.5)	IS: 5182 (P-24) : 2019	37.43	µg/m ³	60
3	Nitrogen Dioxide (as NO ₂)	IS: 5182 (P-3) : 2009	14.99	µg/m ³	80
4	Sulphur Dioxide (as SO ₂)	IS: 5182 (P-6) : 2006	8.26	µg/m ³	80
End of Report					
					
					
Page No. 1/1					
Plot No. 25, Block-B, Narayan Vihar, Jalpur - 362020, Rajasthan Tel: 0141-2948452, 9810355569, 9953147268 E-mail: lab@skstestlabs.com					
www.skstestlabs.com					


SKS Test Labs Private Limited

MeEF & CC Recognized | ISO 9001 | ISO 14001 | ISO 45001



Test Report

Sample Number : SKS/A/05

Name & Address of the Party : M/s RCI - RBPL JV

 176, Rajya Chaitanyam Colony, Chhatrapur, Bundi,
(Rajasthan)

Report No. : SKS/A/2304240006-B

Format No. : 7.8 F-01

Party Reference No. : NIL

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sample Description : Ambient Air

General Information

Sampling Location

: Nainwa Road Magistrate Colony

Sample Collected by

: SKS Team (Mr. Ramesh Katariya)

Sampling Equipment used

: RDS/FPS

Instrument Code

: SKS/RDS-FPS/06/06

Instrument Calibration Status

: Calibrated

Latitude

: 23°25'18"

Longitude

: 75°38'7"

Meteorological condition during monitoring

: Clear Sky

Date of Monitoring

: 21/04/2023 To 22/04/2023

Time of Monitoring

: 11:20 Hrs to 11:20 Hrs

Ambient Temperature (°C)

: Min. 24°C, Max. 40°C

Surrounding Activity

: Human, Vehicular & Other Activities

Scope of Monitoring

: Regulatory Required

Sampling & Analysis Protocol

: SKS/STP/AA/01

Sampling Duration

: 24 Hrs

Parameter Required

: As Per Work Order

S.No.	Parameters	Test Method	Results	Units	NAAQS 2008
1	Carbon Monoxide (as CO)	By Analyzer	0.52	mg/m3	4.0

End of Report



Page No. 1/1

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TC-4652

Test Report

Sample Number : SKS/A/05

Name & Address of the Party : Mrs RGI - RBPL JV

 176, Raja Chakrasarm Colony, Chudarpur, Bundi
(Rajasthan)

Report No. : SKS/A/235424005/A

Format No. : 7.8 F-01

Party Reference No. : NIL

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sample Description : Ambient Air

General Information

Sampling Location : Narwa Road Magistrate Colony
 Sample Collected by : SKS Team (Mr. ramesh katariya)
 Sampling Equipment used : RDS/FPS
 Instrument Code : SKS/RDS/FPS/05/06
 Instrument Calibration Status : Calibrated
 Latitude : 25°26'18"
 Longitude : 75°39'37"
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 21/04/2023 To 22/04/2023
 Time of Monitoring : 11:20 Hrs to 11:20 Hrs.
 Ambient Temperature (°C) : Min. 24°C, Max. 40°C
 Surrounding Activity : Human, Vehicular & Other Activities
 Scope of Monitoring : Regulatory Required
 Sampling & Analysis Protocol : SKS/STP/AA/01
 Sampling Duration : 24 Hrs.
 Parameter Required : As Per Work Order

S.No.	Parameters	Test Method	Results	Units	NAAQS 2009
1	Particulate Matter (as PM -10)	IS : 5182 (P-23) : 2006	69.07	µg/m ³	100
2	Particulate Matter (as PM 2.5)	IS : 5182 (P-24) : 2015	38.18	µg/m ³	60
3	Nitrogen Dioxide (as NO ₂)	IS : 5182 (P-2) : 2001	15.45	µg/m ³	80
4	Sulphur Dioxide (as SO ₂)	IS : 5182 (P-4) : 2006	7.00	µg/m ³	80

End of Report



Page No. 1/1

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Test Report

Sample Number : SKS/A/24

Name & Address of the Party : M/s RGL - RBPL JV

 176, Raya Chikidewarni Colony, Chhatrapur, Bundi,
(Rajasthan)

Report No. : SKS/A/2504340004/B

Format No : 7.8 F-01

Party Reference No : N/L

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sample Description : Ambient Air

General Information

Sampling Location :

Bharat Petrol Pump (Deepura)

Sample Collected by :

SKS Team (Mr. Ramesh kataria)

Sampling Equipment used :

RDS/FPS

Instrument Code :

SKS/RDS/FPS/02/02

Instrument Calibration Status :

Calibrated

Latitude :

25°25'24"

Longitude :

75°39'41"

Meteorological condition during monitoring :

Clear Sky

Date of Monitoring :

21/04/2023 To 22/04/2023

Time of Monitoring :

10:55 Hrs to 10:55 Hrs.

Ambient Temperature (°C) :

Min. 24°C, Max. 40°C

Surrounding Activity :

Human, Vehicular & Other Activities

Scope of Monitoring :

Regulatory Required

Sampling & Analysis Protocol :

SKS/STPAA/01

Sampling Duration :

24 Hrs

Parameter Required :

As Per Work Order

S.No.	Parameters	Test Method	Results	Units	NAAQS 2009
1	Carbon Monoxide (as CO)	By Analyser	0.64	mg/m ³	4.0

"End of Report"



Page No. 1/1

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TC-0852

Test Report

Sample Number : SKS/A/04

Name & Address of the Party : M/s ROI - RBPL JV

 176, Rajya Chakreskarni Colony, Chaturpur, Bundi,
(Rajasthan)

Report No. : SKS/A/2304240004/A

Format No : 7.8 F-01

Party Reference No : Nil

Report Date : 04/06/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sample Description : Ambient Air

General Information

Sampling Location

: Bharat Patel Putra (Deepura)

Sample Collected by

: SKS Team (Mr. Ramesh kataria)

Sampling Equipment used

: RDS/FPS

Instrument Code

: SKS/RDS/FPS/02/03

Instrument Calibration Status

: Calibrated

Latitude

: 25°25'34"

Longitude

: 75°39'41"

Meteorological condition during monitoring

: Clear Sky

Date of Monitoring

: 21/04/2023 To 22/04/2023

Time of Monitoring

: 10:55 Hrs to 10:55 Hrs

Ambient Temperature (°C)

: Min. 24°C, Max. 40°C

Surrounding Activity

: Human, Vehicular & Other Activities

Scope of Monitoring

: Regulatory Required

Sampling & Analysis Protocol

: SKS/STP/AA/01

Sampling Duration

: 24 Hrs

Parameter Required

: As Per Work Order

S.No.	Parameters	Test Method	Results	Units	MAAQs 2009
1	Particulate Matter (as PM -10)	IS : 5182 (P-23) : 2006	65.66	µg/m ³	100
2	Particulate Matter (as PM 2.5)	IS : 5182 (P-24) : 2019	45.36	µg/m ³	60
3	Nitrogen Dioxide (as NO2)	IS : 5182 (P-2) : 2001	17.07	µg/m ³	80
4	Sulphur Dioxide (as SO2)	IS : 5182 (P-8) : 2006	10.46	µg/m ³	80

End of Report



Page No. 1/1

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Test Report

Sample Number : SKS/A03

Name & Address of the Party : M/s RGI - RGSPL JV

 176, Raja Chakrasarm Colony, Chaturpur, Bundi,
(Rajasthan)

Report No. : SKS/A/2304240203/01

Format No : 7.8 F-01

Party Reference No : NIL

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sample Description : Ambient Air

General Information

Sampling Location

: City Kotwali Police Thana Bundi

Sample Collected by

: SKS Team (Mr. Ramesh Katariya)

Sampling Equipment used

: RDS/FPS

Instrument Code

: SKS/RDS/FPS/05/05

Instrument Calibration Status

: Calibrated

Latitude

: 25°25'5"

Longitude

: 75°38'53"

Meteorological condition during monitoring

: Clear Sky

Date of Monitoring

: 21/04/2023 To 22/04/2023

Time of Monitoring

: 10:25 Hrs to 10:25 Hrs

Ambient Temperature (°C)

: Min. 24°C, Max. 40°C

Surrounding Activity

: Human, Vehicular & Other Activities

Scope of Monitoring

: Regulatory Required

Sampling & Analysis Protocol

: SKS/STP/AA/01

Sampling Duration

: 24 Hrs.

Parameter Required

: As Per Work order

S.No.	Parameters	Test Method	Results	Units	NAAQS 2009
1	Carbon Monoxide (as CO)	By Analyzer	0.57	mg/m3	4.0

End of Report



Page No. 1/1

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TC-0052

Test Report

Sample Number : SKSIA/03

Name & Address of the Party : M/s RGI - RBPL JV

 176, Rajya Chakrasakami Colony, Chaturpur, Bundi,
(Rajasthan)

Report No. : SKSIA/2304240003/A

Format No : T & F-01

Party Reference No : NIL

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sample Description : Ambient Air

General Information

Sampling Location

: City Kotwali Police Thana Bundi

Sample Collected by

: SKS Team (Mr. Ramesh Katariya)

Sampling Equipment used

: RDS/FPS

Instrument Code

: SKS/RDS/FPS/05/05

Instrument Calibration Status

: Calibrated

Latitude

: 25°28'N

Longitude

: 76°36'13"E

Meteorological condition during monitoring

: Clear Sky

Date of Monitoring

: 21/04/2023 To 22/04/2023

Time of Monitoring

: 10:25 Hrs to 10:25 Hrs

Ambient Temperature (°C)

: Min. 24°C, Max. 40°C

Surrounding Activity

: Human, Vehicular & Other Activities

Scope of Monitoring

: Regulatory Required

Sampling & Analysis Protocol

: SKS/STP/AA/01

Sampling Duration

: 24 Hrs

Parameter Required

: As Per Work order

S.No.	Parameters	Test Method	Results	Units	NAAQS 2009
1	Particulate Matter (as PM -10)	IS : 5182 (P-23) : 2006	82.59	µg/m ³	100
2	Particulate Matter (as PM 2.5)	IS : 5182 (P-24) : 2019	82.98	µg/m ³	60
3	Nitrogen Dioxide (as NO ₂)	IS : 5182 (P-2) : 2001	16.18	µg/m ³	80
4	Sulphur Dioxide (as SO ₂)	IS : 5182 (P-6) : 2006	9.34	µg/m ³	80

End of Report



Page No. 1/1

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Test Report

Sample Number : SKS/A/02
 Name & Address of the Party : M/s RGI - REIPL JV
 176, Rajya Chakrasarmy Colony, Chhatrapur, Band,
 (Rajasthan)
 Report No. : SKS/A/230424000218
 Format No : 7.5 F-01
 Party Reference No : Nil
 Report Date : 04/05/2023
 Period of Analysis : 24/04/2023-04/05/2023
 Receipt Date : 24/04/2023

Sample Description : Ambient Air

General Information
 Sampling Location : Jait Sagar Nalla Near Meera Bagh Chok
 Sample Collected by : SKS Team (Mr. Ramesh kataria)
 Sampling Equipment used : HDS/FPS
 Instrument Code : SKS/RO5/FP504/04
 Instrument Calibration Status : Calibrated
 Latitude : 25°20'47"
 Longitude : 75°38'46"
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 21/04/2023 To 22/04/2023
 Time of Monitoring : 09:30 Hrs to 09:30 Hrs.
 Ambient Temperature (°C) : Min. 24°C, Max. 40°C
 Surrounding Activity : Human, Vehicular & Other Activities
 Scope of Monitoring : Regulatory Required
 Sampling & Analysis Protocol : SKS/STRAA/01
 Sampling Duration : 24 Hrs.
 Parameter Required : As Per Work Order

S.No.	Parameters	Test Method	Results	Units	NAAQS 2009
1	Carbon Monoxide (as CO)	By Analyzer	0.63	mg/m3	4.0

End of Report



Page No. 1/1


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TC-8652

Test Report

Sample Number : SKS/A/02

Name & Address of the Party : Mrs RGI - RBFL JV

 176, Rajya Chitlaakarmi Colony, Chhatrapur, Bundi,
(Rajasthan)

Report No. : SKS/A/2304240002/A

Format No : 7.8 F-01

Party Reference No : NIL

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sample Description : Ambient Air

General Information

Sampling Location : Jati Sagar Nalla Near Meera Bagh Chok
 Sample Collected by : SKS Team (Mr. Ramesh katariya)
 Sampling Equipment used : RDSFRS
 Instrument Code : SKSRDS/FP9/04/04
 Instrument Calibration Status : Calibrated
 Latitude : 20°29'47"
 Longitude : 75°38'44"
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 21/04/2023 To 22/04/2023
 Time of Monitoring : 09:30 Hrs to 09:30 Hrs.
 Ambient Temperature (°C) : Min. 24°C, Max. 40°C
 Surrounding Activity : Human, Vehicular & Other Activities
 Scope of Monitoring : Regulatory Required
 Sampling & Analysis Protocol : SKS-STPAA/01
 Sampling Duration : 24 Hrs.
 Parameter Required : As Per Work Order

S.No.	Parameters	Test Method	Results	Units	NAQS 2025
1	Particulate Matter (as PM -10)	IS : 5152 (P-23) : 2006	59.59	µgm3	100
2	Particulate Matter (as PM 2.5)	IS : 5152 (P-24) : 2019	39.64	µgm3	80
3	Nitrogen Dioxides (as NO2)	IS : 5182 (P-3) : 2001	15.28	µgm3	80
4	Sulphur Dioxide (as SO2)	IS : 5152 (P-6) : 2006	7.79	µgm3	80

End of Report



Page No. 1/1

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Test Report

Sample Number : SKS/AQ1
 Name & Address of the Party : M/s RCF - RDPL JV
 175, Raja Chhatrakami Colony, Chhatrapur, Bundi,
 (Rajasthan)
 Sample Description : Ambient Air

Report No. : SKS/A/230424001/B
 Format No : 7.8 F-01
 Party Reference No : Nil
 Report Date : 04/05/2023
 Period of Analysis : 24/04/2023-04/05/2023
 Receipt Date : 24/04/2023

General Information
 Sampling Location : Jait Sagar Nala Near Anwali Marriage Garden
 Sample Collected by : SKS Team (Mr. Ramesh katariya)
 Sampling Equipment used : RDSFPS
 Instrument Code : SKS/RDSFPS/01/01
 Instrument Calibration Status : Calibrated
 Latitude : 23°21'11"
 Longitude : 75°38'38"
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 21/04/2023 To 22/04/2023
 Time of Monitoring : 09:00 Hrs to 09:00 Hrs.
 Ambient Temperature (°C) : Min. 24°C, Max. 40°C
 Surrounding Activity : Human, Vehicular & Other Activities
 Scope of Monitoring : Regulatory Required
 Sampling & Analysis Protocol : SKS/S1PVA/01
 Sampling Duration : 24 Hrs.
 Parameter Required : As Per Work Order

S.No.	Parameters	Test Method	Results	Units	NABL 2003
1	Carbon Monoxide (as CO)	By Analyser	0.55	mg/m ³	4.0

End of Report



Page No. 1/1

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TC-6632

Test Report

Sample Number : SKSIA/01

Name & Address of the Party : Mrs RGI - RDBPL JV

 176, Rajya Chikitsakarmi Colony, Chaturpur, Bundi,
(Rajasthan)

Report No. : SKSIA/2304240001/A

Format No : 7.8 F-01

Party Reference No : NIL

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sample Description : Ambient Air

General Information

Sampling Location	: Jai Sagar Nello Neel Anjali Marriage Garden
Sample Collected by	: SKS Team (Mr. Ramesh katariya)
Sampling Equipment used	: RDB/FPS
Instrument Code	: SKS-RDB-FPS/01/01
Instrument Calibration Status	: Calibrated
Latitude	: 25°27'1"
Longitude	: 75°38'35"
Metereological condition during monitoring	: Clear Sky
Date of Monitoring	: 21/04/2023 To 22/04/2023
Time of Monitoring	: 09:00 Hrs to 09:30 Hrs
Ambient Temperature (°C)	: Min. 24°C, Max. 40°C
Surrounding Activity	: Human, Vehicular & Other Activities
Scope of Monitoring	: Regulatory Required
Sampling & Analysis Protocol	: SKS-STP/IAAQ/1
Sampling Duration	: 24 Hrs.
Parameter Required	: As Per Work Order

S.No.	Parameters	Test Method	Results	Units	NAAQS 2009
1	Particulate Matter (as PM -10)	IS : 5182 (P-23) : 2018	65.88	µg/m ³	100
2	Particulate Matter (as PM 2.5)	IS: 5182 (P-24): 2019	44.84	µg/m ³	90
3	Nitrogen Dioxide (as NO ₂)	IS: 5182 (P-2) :2001	16.19	µg/m ³	80
4	Sulphur Dioxide (as SO ₂)	IS: 5182 (P-6): 2006	8.22	µg/m ³	80

End of Report



Page No. 1/1

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Test Report

Sample Number : SKS/A06

Name & Address of the Party : M/s RG - RBP, JV

 176, Raja Chittakarni Colony, Chaturpur, Bundi,
(Rajasthan)

Report No. : SKS/A/2004040006B

Format No : T.S.F-01

Party Reference No : NIL

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sample Description : Ambient Air

General Information

Sampling Location

: Batching Plant Near Meera Road

Sample Collected by

: SKS Team (Mr. Ramesh Kumar)

Sampling Equipment used

: RDS/PPS

Instrument Code

: SKS/RDS/PPS/03/03

Instrument Calibration Status

: Calibrated

Latitude

: 25°25'37"

Longitude

: 75°37'4"

Meteorological condition during monitoring

: Clear Sky

Date of Monitoring

: 21/04/2023 To 22/04/2023

Time of Monitoring

: 11:40 Hrs to 11:40 Hrs.

Ambient Temperature (°C)

: Min. 24°C, Max. 40°C

Surrounding Activity

: Human, Vehicular & Other Activities

Scope of Monitoring

: Regulatory Required

Sampling & Analysis Protocol

: SKS/STR/AA/01

Sampling Duration

: 24 Hrs.

Parameter Required

: As Per Work Order

S.No.	Parameters	Test Method	Results	Units	NAAQs 2008
1	Carbon Monoxide (as CO)	By Analyzer	0.00	mg/m ³	4.0

---End of Report---



Page No. 1/1

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2. Ambient Noise Samples Test Report

 SKS Test Labs Private Limited MeEF & CC Recognized ISO 9001 ISO 14001 ISO 45001		 		
Test Report				
Sample Number : SKS/AN/05 Name & Address of the Party : Mrs RGI - RBPL JV 176, Raja Chakrabarti Colony, Chatarpur, Bonth (Rajasthan)		Report No. : SKS/N/2304240005/A Format No : 7.8 F-01 Party Reference No : NIL Report Date : 04/05/2023 Receipt Date : 24/04/2023 Sampling Duration : 24 hrs Sample Collected by : SKS Team (Mr. Ramesh Kataria) Instrument : Calibrated Calibration Status :		
Sample Description : Ambient Noise Scope of Monitoring : Regulatory Requirement Protocol Used : IS 9899, IS 9878 Instrument Used : SLM				
General Information Sampling Location : Namwa Road Magistrate Colony Instrument Code : SKS/SLM/00 Meteorological condition during monitoring : Clear Sky Date of Monitoring : 21/04/2023 To 22/04/2023 Time of Monitoring : 06:00 AM TO 06:00 AM Ambient Temperature (°C) : Min. 24°C Max. 40°C Surrounding Activity : Human, Vehicular & Other Activities Parameter Required : As Per Work Order				
S.No.	Test Parameters	Test Method	Test Result dB (A)	
			Day Time	Night Time
1	L max	IS: 9899-1981, IS 9878: 1981	75.3	54.4
2	L min	IS: 9899-1981, IS 9878: 1981	62.5	33.3
3	Leq	IS: 9899-1981, IS 9878: 1981	61.24	44.60
Category of Zones		Leq in dB(A)		
		Day	Night	
Industrial		75	70	
Commercial		65	55	
Residential		55	45	
Silence Zone		50	40	
1. Day Time is from 6:00 AM to 10:00 PM. 2. Night Time is reckoned between 10:00 PM. to 6:00 AM 3. Silence Zone is defined as an area up to 100m around premises of Hospitals, Educational Institutions and Courts. Use of vehicle horn, loudspeaker and bursting of crackers is banned in these zones. Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply				
End of Report				
				
		Page No. 1/1		
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TC-6652

Test Report

Sample Number : SKS/AM/04
 Name & Address of the Party : M/s RGI - RRIPL JV
 176, Raja Chakrasarm Colony, Chaturpur, Bundi,
 (Rajasthan)
 Sample Description : Ambient Noise
 Scope of Monitoring : Regulatory Requirement
 Protocol Used : IS 9589, IS 9575
 Instrument Used : SLM
 Report No. : SKS/N/2304240004/A
 Format No : T & F-01
 Party Reference No : NR
 Report Date : 04/05/2023
 Receipt Date : 24/04/2023
 Sampling Duration : 24 Hrs
 Sample Collected by : SKS Team (Mr. Ramesh Katariya)
 Instrument : Calibrated
 Calibration Status :

General Information
 Sampling Location : Bharat Petrol Pump (Daxura)
 Instrument Code : SKS/SLM/01
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 21/04/2023 To 22/04/2023
 Time of Monitoring : 05:00 AM TO 06:00 AM
 Ambient Temperature (°C) : Min. 34°C Max. 40°C
 Surrounding Activity : Human, Vehicle & Other Activities
 Parameter Required : As Per Work Order

S.No.	Test Parameters	Test Method	Test Result dB (A)	
			Day Time	Night Time
1	L _{max}	IS: 9589-1981, IS 9575: 1981	79.5	62.1
2	L _{min}	IS: 9589-1981, IS 9575: 1981	56.3	47.0
3	Leq	IS: 9589-1981, IS 9575: 1981	65.44	52.63

Category of Zones	Leq in dB(A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6:00 AM to 10:00 PM.
 2. Night Time is reckoned between 10:00 PM to 6:00 AM.
 3. Silence Zone is defined as an area up to 100m around premises of Hospitals, Educational Institutions and Courts. Use of vehicle horn, loudspeaker and bursting of crackers is banned in these zones.
 Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.

End of Report



Page No. 1/1

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Test Report

Sample Number : SKS/AN/03
 Name & Address of the Party : Mrs RGI - RBPL JV
 178, Raja Chikisakarn Colony, Chatspur, Bundi
 (Rajasthan)

Report No. : SKS/N/2304240003/A
 Format No. : 7.8 F-01
 Party Reference No. : NIL
 Report Date : 04/05/2023
 Receipt Date : 24/04/2023
 Sampling Duration : 24 Hrs
 Sample Collected by : SKS Team (Mr. Ramesh Katariya)
 Instrument : Calibrated
 Calibration Status :

Sample Description : Ambient Noise
 Scope of Monitoring : Regulatory Requirement
 Protocol Used : IS 9889: IS 9878
 Instrument Used : SLM

General Information
 Sampling Location : City Kowal Police Thana Bundi
 Instrument Code : SKS/SLM02
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 21/04/2023 To 22/04/2023
 Time of Monitoring : 06:00 AM TO 06:00 AM
 Ambient Temperature (°C) : Min. 24°C Max. 40°C
 Surrounding Activity : Human, Vehicular & Other Activities
 Parameter Required : As Per Work Order

S.No.	Test Parameters	Test Method	Test Result dB (A)	
			Day Time	Night Time
1	L max	IS: 9889-1981, IS 9878: 1981	78.3	69.8
2	L min	IS: 9889-1981, IS 9878: 1981	65.8	44.7
3	Leq	IS: 9889-1981, IS 9878: 1981	64.24	50.33

Category of Zones	Leq in dB(A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 06:00 AM to 10:00 PM.
 2. Night Time is reckoned between 10:00 PM to 06:00 AM.
 3. Silence Zone is defined as an area up to 100m around premises of Hospitals, Educational Institutions and Courts. Use of vehicle horn, loudspeaker and bursting of crackers is banned in these zones.
 Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.

End of Report



Page No. 1/1

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TC-6603

Test Report

Sample Number : SKS/IN/03
 Name & Address of the Party : Mr. RGT - RBPL JV
 175, Raja Chhatraseni Colony, Chhatrapur, Bundi,
 (Rajasthan)

Sample Description : Ambient Noise
 Scope of Monitoring : Regulatory Requirement
 Protocol Used : IS 9889, IS 9876
 Instrument Used : SLM

Report No. : SKS/IN/2304240002/A
 Format No : 7.8 F-01
 Party Reference No : NIL
 Report Date : 04/05/2023
 Receipt Date : 24/04/2023
 Sampling Duration : 24 Hrs
 Sample Collected by : SKS Team (Mr. Ramesh kataria)
 Instrument : Calibrated
 Calibration Status :

General Information
 Sampling Location : Jait Sagar Nalla Near Meera Bagh Chokri
 Instrument Code : SKS/SLM/04
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 21/04/2023 To 22/04/2023
 Time of Monitoring : 05:00 AM TO 05:00 AM
 Ambient Temperature (°C) : Min. 24°C Max. 40°C
 Surrounding Activity : Human, Vehicular & Other Activities
 Parameter Required : As Per Work Order

S.No.	Test Parameters	Test Method	Test Result dB (A)	
			Day Time	Night Time
1	L max	IS: 9889-1981, IS 9876: 1981	79.3	68.9
2	L min	IS: 9889-1981, IS 9876: 1981	55.6	43.8
3	Leq	IS: 9889-1981, IS 9876: 1981	65.24	49.43

Category of Zones	Leq in dB(A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 5:00 AM to 10:00 PM.
 2. Night Time is reported between 10:00 PM to 5:00 AM.
 3. Silence Zone is defined as an area up to 100m around premises of hospitals, Educational institutions and Courts. Use of vehicle horn, loudspeaker and burning of crackers is banned in these zones.
 Note: Mixed categories of areas to be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.

End of Report



Page No. 1/1

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Test Report

Sample Number : SKS/ANOT
 Name & Address of the Party : M/s RGI - RSPL JV
 176, Raja Chitsakanni Colony, Chitorpur, Bundi,
 (Rajasthan)

Report No. : SRSh62304240001/A
 Format No : 7.8 F-01
 Party Reference No : NIL
 Report Date : 04/05/2023
 Receipt Date : 24/04/2023
 Sampling Duration : 24 hrs
 Sample Collected by : SKS Team (Mr. Ramesh kumar)

Sample Description : Ambient Noise
 Scope of Monitoring : Regulatory Requirement
 Protocol Used : IS 9889, IS 9876
 Instrument Used : SLM

General Information
 Sampling Location : Jait Sagar Nalla Near Amwal marriage Garden
 Instrument Code : SKS-SLM01
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 21/04/2023 To 22/04/2023
 Time of Monitoring : 09:00 AM TO 08:00 AM
 Ambient Temperature (°C) : Min. 24°C Max. 42°C
 Surrounding Activity : Human, Vehicular & Other Activities
 Parameter Required : As Per Work Order

S. No.	Test Parameters	Test Method	Test Result dB (A)	
			Day Time	Night Time
1	L max	IS: 9889-1981, IS 9876: 1981	77.7	66.8
2	L min	IS: 9889-1981, IS 9876: 1981	55.0	45.7
3	Leq	IS: 9889-1981, IS 9876: 1981	63.64	61.33

Category of Zones	Leq in dB(A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6:00 AM to 10:00 PM.
 2. Night Time is reckoned between 10:00 PM to 5:00 AM.
 3. Silence Zone is defined as an area up to 100m around premises of Hospitals, Educational Institutions and Courts. Use of vehicle horn, loudspeaker and bursting of crackers is banned in these zones.
 Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.

End of Report



(Authorized Signatory)



Page No. 1/1

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Test Report

Sample Number : SKS/AN08
 Name & Address of the Party : M/s ROL - RBHPL JV
 176, Raja Chiklaakam Colony, Chhatapur, Bundi
 (Rajasthan)
 Sample Description : Ambient Noise
 Scope of Monitoring : Regulatory Requirement
 Protocol Used : IS 9969, IS 9876
 Instrument Used : SLM

Report No. : SKS/N2304240006/A
 Format No : 7.8 F-01
 Party Reference No : NIL
 Report Date : 04/05/2023
 Receipt Date : 04/04/2023
 Sampling Duration : 24 Hrs.
 Sample Collected by : SKS Team (Mr. Ramesh Katariya)
 Instrument :
 Calibration Status : Calibrated

General Information

Sampling Location : Batching Plant Near Meers Road
 Instrument Code : SKS-SLM405
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 21/04/2023 To 22/04/2023
 Time of Monitoring : 06:00 AM TO 06:00 AM
 Ambient Temperature (°C) : Min: 24°C Max: 40°C
 Surrounding Activity : Human, Vehicular & Other Activities
 Parameter Required : As Per Work Order

S.No.	Test Parameters	Test Method	Test Result dB (A)	
			Day Time	Night Time
1	L max	IS: 9969-1981, IS 9876: 1981	75.7	58.2
2	L min	IS: 9969-1981, IS 9876: 1981	53.0	43.1
3	Leq	IS: 9969-1981, IS 9876: 1981	51.54	48.73

Category of Zones	Leq in dB(A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6:00 AM to 10:00 PM.

2. Night Time is reckoned between 10:00 PM to 6:00 AM

3. Silence Zone is defined as an area up to 100m around premises of Hospitals, Educational Institutions and Courts. Use of vehicle horn, loudspeaker and bursting of crackers is banned in these zones.

Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.

End of Report



Page No. 1/1

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3. Ground & Surface Water Samples Test Report



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Test Report

Sample Number : SKS/GW/05

Name & Address of the Party : M/s RGI - RBPL JV
175, Raja Chakrasarm Colony, Chudarpur, Bundi,
(Rajasthan)

Sample Description : Water Sample (Ground Water)

Location : Batching plant Near Meera Road

Sample Collected by : SKS Team (Mr. Ramesh Kataria)

Preservation : Suitable Preservation

Sampling and Analysis Protocol : SKS/STPAW/1

Report No. : SKSAW/2306240006/B

Format No : 7.3 F-01

Party Reference No : Nil

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sampling Date : 21/04/2023

Sampling Quantity : 2 Ltr

Sampling Type : Grab

Longitude : -

Latitude : -

S.No.	Test Parameters	Test Method	Result	Unit	Limit as Per IS: 10500-2012	
					Acceptable Limit	Permissible Limit
1	Phosphate (as PO ₄)	APHA 4500PO	2.98	mg/L	NA	NA
2	Hexavalent Chromium (as Cr+6)	IS 3025 (P-38), 1589 RA 2817	<BLQ[*]LOQ -0.02	mg/L	0.1	2.0
3	Dissolved Oxygen	IS 3025(P-38): 1989	6.6	mg/L	-	-

*Below Limit Of Quantification, **LOQ - Limit Of Quantification.

End of Report




Page No. 1/1



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Test Report

Sample Number : SKS/GW/05
 Name & Address of the Party : M/s RGI - RSIPL JV
 178, Rajya Chakrasakam Colony, Chhatrapur, Bundi,
 (Rajasthan)
 Sample Description : Water Sample (Ground Water)
 Location : Batching plant Near Meers Road
 Sample Collected by : SKS Team (Mr. Ramesh Kataria)
 Preservation : Suitable Preservation
 Sampling and Analysis Protocol : SKS/STP/W/1

ULR No. : TC6522300000067F
 Report No. : SKS/W/2304240006/A
 Format No. : T & F-01
 Party Reference No. : NIL
 Report Date : 04/05/2023
 Period of Analysis : 24/04/2023-04/05/2023
 Receipt Date : 24/04/2023
 Sampling Date : 21/04/2023
 Sampling Quantity : 2 Lit.
 Sampling Type : Grab
 Longitude : -
 Latitude : -

S.No.	Test Parameters	Test Method	Result	Unit	Limit as Per IS: 10500-2012	
					Acceptable Limit	Permissible Limit
1	pH	IS: 3025 (P-11) : 2022	8.07	-	5.5 to 8.5	No Relaxation
2	Chloride (as Cl)	IS: 3025 (P-32) : 1988	988.86	mg/L	250	1000
3	Fluoride (as F)	APHA (23rd Edition) 4500F0: 2017	0.45	mg/L	1.0	1.5
4	Nitrate (as NO ₃)	IS 3025 (P-34) (Chromotropic Method) : 1988	1.78	mg/L	45.0	No Relaxation
5	Phenolic Compounds (as C ₆ H ₅ OH)	(APHA 23rd Edition) 8820C: 2017	*BLQ/*LOQ -0.10	mg/L	0.001	0.002
6	Sulphate (as SO ₄)	IS 3025 (P-24)/Sec-1: 2021	164.20	mg/L	200	400
7	Total Alkalinity (as CaCO ₃)	IS 3025 (P-23) : 1986	65.96	mg/L	200	600
8	Total Dissolved Solids	IS 3025 (P-16) : 1984	1545.0	mg/L	500	2000
9	Total Hardness (CaCO ₃)	IS 3025 (P-21) : 2009	405.84	mg/L	200	600
10	Cadmium (as Cd)	APHA (23rd Edition) 3030D, 3113B: 2017	*BLQ/*LOQ -0.05	mg/L	0.003	No Relaxation
11	Copper (as Cu)	APHA (23rd Edition) Method No. 3111B: 2017	*BLQ/*LOQ -0.05	mg/L	0.05	1.5
12	Iron (as Fe)	IS 3025 (P-63) : 2003	0.40	mg/L	1.0	No Relaxation
13	Lead (as Pb)	APHA (23rd Edition) 3030D, 3113B: 2017	*BLQ/*LOQ -0.05	mg/L	0.01	No Relaxation
14	Manganese (as Mn)	APHA (23rd Edition) 3030D, 3111 B: 2017	*BLQ/*LOQ -0.05	mg/L	0.1	5.0
15	Mercury (as Hg)	APHA (23rd Edition) 3114C: 2017	*BLQ/*LOQ -0.001	mg/L	0.01	No Relaxation
16	Zinc (as Zn)	APHA (23rd Edition), 3030D, 3113B: 2017	*BLQ/*LOQ - 0.20	mg/L	5.0	15.0
17	Arsenic	APHA (23rd Edition) 3114C: 2017	*BLQ/*LOQ -0.005	mg/L	-	-



Page No. 1/2

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Test Report

Sample Number : SKS/GW/05

Name & Address of the Party : M/s RGT - RBPL JV

 17B, Rajya Chakrasakmi Colony, Chutepur, Bundi,
(Rajasthan)

Report No. : SKS/W/2304240005/B

Format No. : 7.8 F-01

Party Reference No. : NIL

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sampling Date : 21/04/2023

Sampling Quantity : 2 Ltr.

Sampling Type : Grab

Longitude : -

Latitude : -

Sample Description : Water Sample (Ground Water)

Location : Carter Word Sr. Sec. School Nainwa Road

Sample Collected by : SKS Team (Mr. Ramesh Katariya)

Preservation : Suitable Preservation

Sampling and Analysis Protocol : SKS/STP/W/1

S.No.	Test Parameters	Test Method	Result	Unit	Limit as Per IS: 10500-2012	
					Acceptable Limit	Permissible Limit
1	Phosphate (as PO ₄)	APHA 4500PD	2.05	mg/L	NA	NA
2	Hexavalent Chromium (as Cr+6)	IS 3025 (P-38), 1999 RA 2017	*BLQ(**LQ -0.02)	mg/L	0.1	2.0
3	Dissolved Oxygen	IS 3025(P-38): 1999	0.1	mg/L	-	-

*BLQ - Below Limit Of Quantification, **LQ - Limit Of Quantification

End of Report



Page No: 1/1

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TC 652

Test Report

Sample Number : SKS/QW/05

Name & Address of the Party : M/s RQI - RSPL JV

 175, Raja Chhatrakarni Colony, Chaturpur, Bundi,
(Rajasthan)

ULR No. : TC6522360000068F

Report No. : SKS/W/2304240055A

Format No. : 7.8 F-01

Party Reference No. : NIL

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sampling Date : 21/04/2023

Sampling Quantity : 2 Lit

Sampling Type : Grab

Longitude : -

Latitude : -

Sample Description : Water Sample (Ground Water)

Location : Career Ward Br. Sec. School Nahwa Road

Sample Collected by : SKS Team (Mr. Ramesh Katariya)

Preservation : Suitable Preservation

Sampling and Analysis Protocol : SKS/STPW/1

S.No.	Test Parameters	Test Method	Result	Unit	Limit as Per IS: 10500-2012	
					Acceptable Limit	Permissible Limit
1	pH	IS: 3025 (P-11) : 2022	7.38	-	8.5 to 8.5	No Relaxation
2	Chloride (as Cl)	IS 3025 (P-32) : 1988	238.81	mg/L	250	1000
3	Fluoride (as F)	APHA (23rd Edition) 4500FD: 2017	0.33	mg/L	1.0	1.5
4	Nitrate (as NO ₃)	IS 3025 (P-34) (Chromotropic Method) : 1988	1.08	mg/L	45.0	No Relaxation
5	Phenolic Compounds (as C ₆ H ₅ OH)	(APHA 23rd Edition) 8530C: 2017	*BLQ**LOQ -0.10	mg/L	0.001	0.002
6	Sulphate (as SO ₄)	IS 3025 (P-24)/Sec-1: 2021	159.92	mg/L	250	400
7	Total Alkalinity (as CaCO ₃)	IS 3025 (P-23) : 1988	124.16	mg/L	200	600
8	Total Dissolved Solids	IS 3025 (P-16) : 1984	1034.0	mg/L	500	2000
9	Total Hardness (CaCO ₃)	IS 3025 (P-21) : 2009	867.28	mg/L	200	600
10	Cadmium (as Cd)	APHA (23rd Edition) 3030D, 3113B: 2017	*BLQ**LOQ - 0.05	mg/L	0.003	No Relaxation
11	Copper (as Cu)	APHA (23rd Edition) Method No. 3111B: 2017	*BLQ**LOQ -0.05	mg/L	0.05	1.5
12	Iron (as Fe)	IS 3025 (P-63) : 2003	0.21	mg/L	1.0	No Relaxation
13	Lead (as Pb)	APHA (23rd Edition) 3030D, 3113B: 2017	*BLQ**LOQ -0.05	mg/L	0.01	No Relaxation
14	Manganese (as Mn)	APHA (23rd Edition) 3030D, 3111 B: 2017	*BLQ**LOQ -0.05	mg/L	0.1	0.3
15	Mercury (as Hg)	APHA (23rd Edition) 3114C: 2017	*BLQ**LOQ - 0.001	mg/L	0.01	No Relaxation
16	Zinc (as Zn)	APHA (23rd Edition), 3030D, 3113B: 2017	*BLQ**LOQ -0.20	mg/L	5.0	15.0
17	Arsenic	APHA (23rd Edition) 3114C: 2017	*BLQ**LOQ -0.005	mg/L	-	-


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Test Report

Sample Number : SKS/GW/04

Name & Address of the Party : M/s. RCI - RBPL JV

 176, Raja Chhatrakarmi Colony, Chuzapur, Bundi,
(Rajasthan)

Report No. : SKS/W/2304240004/B

Format No. : 7.8 F-01

Party Reference No : Nil

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sampling Date : 21/04/2023

Sampling Quantity : 2 Ltr

Sampling Type : Grab

Longitude : -

Latitude : -

Sample Description : Water Sample (Ground Water)

Location : Bharal Petrol Pump (Deepura)

Sample Collected by : SKS Team (Mr. Ramesh Katariya)

Preservation : Suitable Preservation

 Sampling and Analysis
Protocol : SKS/STPWW

S.No.	Test Parameters	Test Method	Result	Unit	Limit as Per IS: 10500-2012	
					Acceptable Limit	Permissible Limit
1	Phosphate (as PO ₄)	APHA 4500PO	3.81	mg/L	NA	NA
2	Hexavalent Chromium (as Cr+6)	IS 3025 (P-38), 1989 RA 2017	*BLQ (**LOQ -0.02)	mg/L	0.1	2.0
3	Dissolved Oxygen	IS 3025(P-38): 1989	4.2	mg/L	-	-

*BLQ - Below Limit Of Quantification, **LOQ - Limit Of Quantification.

End of Report



Page No. 1/1

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Test Report

Sample Number : SKS/QW04

 Name & Address of the Party : Mr RGI - RBPL JV
170, Rajya Chakrasakami Colony, Chaturpur, Bundi,
(Rajasthan)

 Sample Description : Water Sample (Ground Water)
Location : Bharat Petrol Pump (Despur)
Sample Collected by : SKS Team (Mr. Ramesh Katariya)
Preservation : Suitable Preservation
Sampling and Analysis Protocol : SKS/STR/W1

 ULR No. : TC685223000000065F
Report No. : SKS/W/2304240004/A
Format No : 7.8 F-01
Party Reference No : NIL
Report Date : 04/05/2023
Period of Analyte : 04/04/2023-04/05/2023
Receipt Date : 24/04/2023
Sampling Date : 21/04/2023
Sampling Quantity : 2 Ltr.
Sampling Type : Grab
Longitude : -
Latitude : -

S.No.	Test Parameters	Test Method	Result	Unit	Limit as Per IS: 10300-2012	
					Acceptable Limit	Permissible Limit
1	pH	IS: 3025 (P-11) : 2022	7.54	-	6.5 to 8.5	No Relaxation
2	Chloride (as Cl)	IS 3025 (P-32) : 1989	175.71	mg/L	250	1000
3	Fluoride (as F)	APHA (23rd Edition) 4500FD: 2017	0.40	mg/L	1.0	1.5
4	Nitrate (as NO ₃)	IS 3025 (P-34) (Chromotropic Method I) : 1988	2.08	mg/L	45.0	No Relaxation
5	Phenolic Compounds (as C ₆ H ₅ OH)	(APHA 23rd Edition) 5530C: 2017	*BLQ(*LOQ -0.18)	mg/L	0.001	0.002
6	Sulphate (as SO ₄)	IS 3025 (P-24)(Sec-1) : 2021	271.50	mg/L	250	400
7	Total Alkalinity (as CaCO ₃)	IS 3025 (P-23) : 1988	353.08	mg/L	200	600
8	Total Dissolved Solids	IS 3025 (P-16) : 1984	1478.0	mg/L	500	2000
9	Total Hardness (CaCO ₃)	IS 3025 (P-21) : 2009	768.08	mg/L	200	600
10	Cadmium (as Cd)	APHA (23rd Edition) 3030D, 3113B: 2017	*BLQ(*LOQ -0.05)	mg/L	0.003	No Relaxation
11	Copper (as Cu)	APHA (23rd Edition) Method No. 3111B: 2017	*BLQ(*LOQ -0.05)	mg/L	0.05	1.5
12	Iron (as Fe)	IS 3025 (P-53) : 2003	0.36	mg/L	1.0	No Relaxation
13	Lead (as Pb)	APHA (23rd Edition) 3030D, 3113B: 2017	*BLQ(*LOQ -0.05)	mg/L	0.01	No Relaxation
14	Manganese (as Mn)	APHA (23rd Edition) 3030D, 3111 B: 2017	*BLQ(*LOQ -0.05)	mg/L	0.1	0.3
15	Mercury (as Hg)	APHA (23rd Edition) 3114C: 2017	*BLQ(*LOQ -0.001)	mg/L	0.01	No Relaxation
16	Zinc (as Zn)	APHA (23rd Edition), 3030D, 3113B: 2017	*BLQ(*LOQ -0.20)	mg/L	5.0	15.0
17	Arsenic	APHA (23rd Edition) 3114C: 2017	*BLQ(*LOQ -0.005)	mg/L	-	-


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Test Report

Sample Number :

Name & Address of the Party : M/s RCI - RBPL JV

 175, Raja Chakrasami Colony, Chhatrapur, Bundi,
(Rajasthan)

Report No. : SKS/W/2304240003/B

Format No : F-01

Party Reference No : Nil

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sampling Date : 21/04/2023

Sampling Quantity : 2 Ltr

Sampling Type : Grab

Longitude :

Latitude :

Sample Description :

Water Sample (Ground water)

Location :

City Kotwal Police Thana Bundi

Sample Collected by :

SKS Team (Mr. Ramesh Kalanyal)

Preservation :

Suitable Preservation

 Sampling and Analysis
Protocol :

SKS/STP/W/1

S.No.	Test Parameters	Test Method	Result	Unit	Limit as Per IS: 10500-2012	
					Acceptable Limit	Permissible Limit
1	Phosphate (as PO ₄)	APHA 4500PO	0.48	mg/L	NA	NA
2	Hexavalent Chromium (as Cr+6)	IS 5025 (P-38), 1989 RA 2017	BLQ (**LOQ -0.02)	mg/L	0.1	2.0
3	Dissolved Oxygen	IS 5025(P-38): 1989	5.2	mg/L	—	—

*BLQ - Below Limit Of Quantification; **LOQ - Limit Of Quantification.

End of Report



Page No. 1/1

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Test Report

Sample Number: SKS/GW03

Name & Address of the Party : M/s RGT - RBPL JV
17B, Rajya Chaitrakami Colony, Chaturpur, Bundi,
(Rajasthan)

Sample Description : Water Sample (Ground water)
Location : City Koriwal Police Thana Bundi
Sample Collected by : SKS Team (Mr Ramesh Katariya)
Preservation : Suitable Preservation
Sampling and Analysis Protocol : SKS/STPW01

ULR No. : TC/8422300000004F
Report No. : SKS/W/2304240003/A
Format No. : 7.8 F-01
Party Reference No. : NIL
Report Date : 04/05/2023
Period of Analysis : 24/04/2023-04/05/2023
Receipt Date : 24/04/2023
Sampling Date : 21/04/2023
Sampling Quantity : 2 Ltr.
Sampling Type : Grab
Longitude : -
Latitude : -

S.No.	Test Parameters	Test Method	Result	Unit	Limit as Per IS: 10500-2012	
					Acceptable Limit	Permissible Limit
1	pH	IS: 3025 (P-11): 2022	6.99	-	6.5 to 8.5	No Relaxation
2	Chloride (as Cl)	IS 3025 (P-32): 1988	121.10	mg/L	250	1000
3	Fluoride (as F)	APHA (23rd Edition) 4500FD: 2017	0.36	mg/L	1.0	1.5
4	Nitrate (as NO ₃)	IS 3025 (P-34) (Chromotropic Method J): 1988	1.88	mg/L	45.0	No Relaxation
5	Phenolic Compounds (as C ₆ H ₅ OH)	(APHA 23rd Edition) 8530C: 2017	"BLQ"/"LOQ -0.10"	mg/L	0.001	0.002
6	Sulphate (as SO ₄)	IS 3025 (P-24)/Sec-1: 2021	160.50	mg/L	200	400
7	Total Alkalinity (as CaCO ₃)	IS 3025 (P-33): 1988	151.32	mg/L	200	600
8	Total Dissolved Solids	IS 3025 (P-16): 1984	825.10	mg/L	600	2000
9	Total Hardness (CaCO ₃)	IS 3025 (P-21): 2000	883.68	mg/L	200	600
10	Cadmium (as Cd)	APHA (23rd Edition) 3030D, 3113B: 2017	"BLQ"/"LOQ -0.08"	mg/L	0.003	No Relaxation
11	Copper (as Cu)	APHA (23rd Edition) Method No. 3111B: 2017	"BLQ"/"LOQ -0.08"	mg/L	0.05	1.5
12	Iron (as Fe)	IS 3025 (P-63): 2003	0.21	mg/L	1.0	No Relaxation
13	Lead (as Pb)	APHA (23rd Edition) 3030D, 3113B: 2017	"BLQ"/"LOQ -0.08"	mg/L	0.01	No Relaxation
14	Manganese (as Mn)	APHA (23rd Edition) 3030D, 3111 B: 2017	"BLQ"/"LOQ -0.05"	mg/L	0.1	0.3
15	Mercury (as Hg)	APHA (23rd Edition) 3114C: 2017	"BLQ"/"LOQ -0.00"	mg/L	0.01	No Relaxation
16	Zinc (as Zn)	APHA (23rd Edition), 3030D, 3113B: 2017	"BLQ"/"LOQ -0.29"	mg/L	5.0	15.0
17	Arsenic	APHA (23rd Edition) 3114C: 2017	"BLQ"/"LOQ -0.05"	mg/L	-	-



Page No. 1/2

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Test Report

Sample Number : SKS/GW02

Name & Address of the Party : M/s RGI - RSPL JV

 170, Rajya Chaitakami Colony, Chotaagpur, Bunkil,
(Rajasthan)

Report No. : SKS/W/2304240002/B

Format No. : 7.8 F-01

Party Reference No. : NIL

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sampling Date : 24/04/2023

Sampling Quantity : 2 Lit

Sampling Type : Grab

Longitude : --

Latitude : --

Sample Description : Water Sample (Ground Water)

Location : Jait Sagar Nalla Near Meera Bagh Chokli

Sample Collected by : SKS Team (Mr. Ramesh katariya)

Preservation : Suitable Preservation

Sampling and Analysis Protocol : SKS/STP/W/1

S.No.	Test Parameters	Test Method	Result	Unit	Limit as Per IS: 10500-2012	
					Acceptable Limit	Permissible Limit
1	Phosphate (as PO ₄)	APHA 4500PD	0.28	mg/L	NA	NA
2	Hexavalent Chromium (as Cr+6)	IS 3025 (P-36), 1989 RA 2017	*BLQ(**LOQ -0.02)	mg/L	0.1	2.0
3	Dissolved Oxygen	IS 3025(P-39): 1989	5.8	mg/L	--	--

*BLQ - Below Limit Of Quantification, **LOQ - Limit Of Quantification.

End of Report



Page No. 1/1

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Test Report

Sample Number : SKS/GW/02

Name & Address of the Party : M/s RGI - REPL JV
17B, Rajya Chittakarni Colony, Chulapuri, Bundi,
(Rajasthan)

Sample Description : Water Sample (Ground Water)
Location : Jait Sagar Nala Near Meera Bagh Chokri
Sample Collected by : SKS Team (Mr. Ramesh katariya)
Preservation : Suitable Preservation
Sampling and Analysis Protocol : SKS/STP/W/1

ULR No. : TC655221000000063F
Report No. : SKS/W/2304240020W
Format No : 7.8 F-01
Party Reference No : Nil
Report Date : 04/05/2023
Period of Analysis : 24/04/2023-04/05/2023
Receipt Date : 24/04/2023
Sampling Date : 24/04/2023
Sampling Quantity : 2 Ltr
Sampling Type : Grab
Longitude : --
Latitude : --

S.No.	Test Parameters	Test Method	Result	Unit	Limit as Per IS: 10500-2012	
					Acceptable Limit	Permissible Limit
1	pH	IS: 3025 (P-11) : 2022	7.49	--	6.5 to 8.5	No Relaxation
2	Chloride (as Cl)	IS 3025 (P-32) : 1988	22.80	mg/L	250	1000
3	Fluoride (as F)	APHA (23rd Edition) 4500F0: 2017	0.32	mg/L	1.0	1.5
4	Nitrate (as NO3)	IS 3025 (P-34) (Chromotropic Method) : 1988	1.07	mg/L	45.0	No Relaxation
5	Phenolic Compounds (as C6H5OH)	(APHA 23rd Edition) 5530C: 2017	*BLQ(*LOQ -0.10)	mg/L	0.001	0.002
6	Sulphate (as SO4)	IS 3025 (P-24) Sec-1: 2021	31.97	mg/L	200	400
7	Total Alkalinity (as CaCO3)	IS 3025 (P-23) : 1995	155.20	mg/L	200	600
8	Total Dissolved Solids	IS 3025 (P-16): 1984	238.0	mg/L	500	2000
9	Total Hardness (CaCO3)	IS 3025 (P-21): 2009	214.32	mg/L	200	600
10	Cadmium (as Cd)	APHA (23rd Edition) 3030D, 3113B: 2017	*BLQ(*LOQ -0.05)	mg/L	0.003	No Relaxation
11	Copper (as Cu)	APHA (23rd Edition) Method No. 3111B: 2017	*BLQ(*LOQ -0.05)	mg/L	0.05	1.5
12	Iron (as Fe)	IS 3025 (P-63): 2003	0.20	mg/L	1.0	No Relaxation
13	Lead (as Pb)	APHA (23rd Edition) 3030D, 3113B: 2017	*BLQ(*LOQ -0.05)	mg/L	0.01	No Relaxation
14	Manganese (as Mn)	APHA (23rd Edition) 3030D, 3111 B: 2017	*BLQ(*LOQ -0.05)	mg/L	0.1	0.3
15	Mercury (as Hg)	APHA (23rd Edition) 3114C: 2017	*BLQ(*LOQ -0.001)	mg/L	0.01	No Relaxation
16	Zinc (as Zn)	APHA (23rd Edition), 3030D, 3113B: 2017	*BLQ(*LOQ -0.20)	mg/L	5.0	15.0
17	Arsenic	APHA (23rd Edition) 3114C: 2017	*BLQ(*LOQ -0.005)	mg/L	--	--



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Test Report

Sample Number : SKS/GW/01

Name & Address of the Party : M/s RQI - RBPL JV

 176, Raja Chittakarni Colony, Chaturpur, Bundi,
(Rajasthan)

Report No. : SKS/WQ304240001/B

Format No : T.6 F-01

Party Reference No : NIL

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sampling Date : 21/04/2023

Sampling Quantity : 2 Lit

Sampling Type : Grab

Longitude : -

Latitude : -

Sample Description : Water Sample (Ground Water)

Location : Jak Sagar Nalis Near Amwal Mangro Garden

Sample Collected by : SKS Team (Mr. Ramesh Kateriya)

Preservation : Suitable Preservation

Sampling and Analysis Protocol : SKS/STP/WIT

S.No.	Test Parameters	Test Method	Result	Unit	Limit as Per IS: 10500-2012	
					Acceptable Limit	Permissible Limit
1	Phosphate (as PO ₄)	APHA 4500PD	0.25	mg/L	NA	NA
2	Hexavalent Chromium (as Cr+6)	IS 3025 (P-38), 1989 RA 2017	***BLQ(***LOQ - 0.02)	mg/L	0.1	2.0
3	Dissolved Oxygen	IS 3025(P-38): 1988	5.8	mg/L		-

***BLQ - Below Limit Of Quantification, ***LOQ - Limit Of Quantification

End of Report



Page No. 1/1

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Test Report

Sample Number : SKS/QW/01
Name & Address of the Party : Mrs RGI - RBPL JV
176, Raja Chhatrasen Colony, Chhatrapur, Bunk,
(Rajasthan)

Sample Description : Water Sample (Ground Water)
Location : Jait Sagar Nala Near Arniwal Marriage Garden
Sample Collected by : SKS Team (Mr. Ramesh Katariya)
Preservation : Sublime Preservation
Sampling and Analysis Protocol : SKS/STP/W1

ULR No. : TC66622300000062F
Report No. : SKS/N/2304240001/A
Format No : 7.8 F-01
Party Reference No : NIL
Report Date : 04/05/2023
Period of Analysis : 24/04/2023-04/05/2023
Receipt Date : 24/04/2023
Sampling Date : 21/04/2023
Sampling Quantity : 2 Ltr
Sampling Type : Grab
Longitude : -
Latitude : -

S.No.	Test Parameters	Test Method	Result	Unit	Limit as Per IS: 10500-2012	
					Acceptable Limit	Permissible Limit
1	pH	IS: 3025 (P-11) : 2022	7.71	-	6.5 to 8.5	No Relaxation
2	Chloride (as Cl)	IS 3025 (P-32) : 1988	82.60	mg/L	250	1000
3	Fluoride (as F)	APHA (23rd Edition) 4500FD : 2017	0.26	mg/L	1.0	1.5
4	Nitrate (as NO ₃)	IS 3025 (P-34) (Chromotropic Method) : 1988	0.97	mg/L	45.0	No Relaxation
5	Phenolic Compounds (as C ₆ H ₅ OH)	(APHA 23rd Edition) 5530C : 2017	*BLQ(*LOQ-0.1)	mg/L	0.001	0.002
6	Sulphate (as SO ₄)	IS 3025 (P-24) Sec-1: 2021	153.47	mg/L	200	400
7	Total Alkalinity (as CaCO ₃)	IS 3025 (P-23) : 1988	221.16	mg/L	200	600
8	Total Dissolved Solids	IS 3025 (P-16) : 1984	824.0	mg/L	500	2000
9	Total Hardness (CaCO ₃)	IS 3025 (P-21) : 2008	287.28	mg/L	200	600
10	Cadmium (as Cd)	APHA (23rd Edition) 3030D, 3113B : 2017	*BLQ(*LOQ-0.05)	mg/L	0.05	No Relaxation
11	Copper (as Cu)	APHA (23rd Edition) Method No. 3111B : 2017	*BLQ(*LOQ-0.05)	mg/L	0.05	1.5
12	Iron (as Fe)	IS 3025 (P-53) : 2003	0.15	mg/L	1.0	No Relaxation
13	Lead (as Pb)	APHA (23rd Edition) 3030D, 3113B : 2017	*BLQ(*LOQ-0.05)	mg/L	0.01	No Relaxation
14	Manganese (as Mn)	APHA (23rd Edition) 3030D, 3111 B : 2017	*BLQ(*LOQ-0.05)	mg/L	0.1	0.3
15	Mercury (as Hg)	APHA (23rd Edition) 3114C : 2017	*BLQ(*LOQ-0.001)	mg/L	0.01	No Relaxation
16	Zinc (as Zn)	APHA (23rd Edition), 3030D, 3113B : 2017	*BLQ(*LOQ-0.2)	mg/L	5.0	15.0
17	Arsenic	APHA (23rd Edition) 3114C : 2017	*BLQ(*LOQ-0.035)	mg/L	-	-



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TC-8882

Test Report

Sample Number : SKS/SW/01

Name & Address of the Party : Mrs RGI - RBPL JV

 176, Rajya Chhatrakarni Colony, Chhatrapur, Bundi
(Rajasthan)

Report No. : SKS/W/2304240007A

Format No. : 7.8 F-01

Party Reference No. : NA

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sampling Date : 21/04/2023

Sampling Quantity : 2 Lit

Sampling Type : Grab

Packing Status : Temp. Sealed

ULR No. : TC66522300000356F

Sample Description : SURFACE WATER

Location : Jai Sagar Lake

Sample Collected by : SKS Team (Mr. Ramesh Kataria)

Parameter Required : As Per Work Order

Sampling and Analysis Protocol : IS 2296

S.No.	Test Parameters	Test Method	Results	Units
1	pH value	IS 3025 (P-11): 1983 Reaff. 2017	7.67	—
2	Turbidity	IS 3025 (Part 16): 1984, Reaff. 2017, (Nephelometric Method)	3.39	NTU
3	Total Dissolved Solids	IS 3025 (P-16): 1984 Reaff. 2017	208.0	mg/l
4	Chloride (as Cl)	IS: 3025 (Part 32): 1988, Reaff. 2019	33.30	mg/l
5	Sulphate as (SO4)	IS: 3025 (Part 24): 1988, Reaff. 2019 Turbidity Method	30.43	mg/l
6	Total Suspended Solids	IS: 3025 (Part 17): 1984, Reaff. 2017	13.0	mg/l
7	Total Hardness (CaCO3)	IS: 3025 (Part 21): 2009, Reaff. 2019	164.16	mg/l
8	Calcium (as Ca)	IS: 3025 (Part 40): 1981 Reaff. 2019 (EDTA method)	29.66	mg/l
9	Magnesium	IS: 3025 (Part 46): 1994, Reaff. 2019 (EDTA method)	24.38	mg/l
10	Fluoride (as F)	APHA 23rd Edition 2017, 4500FD	0.36	mg/l
11	Nitrate (as NO3)	IS: 3025 (Part 34): 1988, Reaff. 2019 (Chromotropic Method)	1.07	mg/l
12	Dissolved oxygen	IS : 3025 (Part-38) : 1989, Ref. 2019	6.3	mg/l
13	Biochemical Oxygen Demand (BOD) (3 days at 27°C)	IS: 3025 (Part-44): 1993, Ref. 2019	40.50	mg/l
14	Chemical Oxygen Demand (COD)	IS : 3025 (Part 50) : 2009/af: 2017	204.40	mg/l
15	Iron	IS:3025(P-53):2003,RA,2019-2003	1.80	mg/l
16	Zinc as (Zn)	APHA (23rd edition), 3330D, 3113B	"BLQ"/"LOQ - 0.20	mg/l
17	Copper (Cu)	APHA (23rd edition), 3111B	"BLQ"/"LOQ - 0.06	mg/l
18	Manganese as Mn	APHA3111B	"BLQ"/"LOQ -0.05	mg/l



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Test Report

Sample Number : SKS-SW/01

Name & Address of the Party : M/s RGI - RBPL JV

 176, Raja Chokkaskami Colony, Chutapur, Bundi,
(Rajasthan)

Report No. : SKS/W/2304240007/B

Format No : 7.8 F-01

Party Reference No : NIL

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sampling Date : 21/04/2023

Sampling Quantity : 2 Lit

Sampling Type : Grab

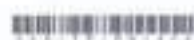
Packing Status : Temp. Sealed

 Sample Description : SURFACE WATER
 Location : Jait Sagar Lake
 Sample Collected by : SKS Team (Mr. Ramesh Katariya)
 Parameter Required : As Per Work Order
 Sampling and Analysis Protocol : IS 2296

S.No.	Test Parameters	Test Method	Results	Units
1	Sodium	IS-3025(P-45):1993, RA 2019:1993	19.89	mg/l
2	Potassium	IS-3025(P-45):1993, RA 2019:1993	2.41	mg/l
3	Residual Free Chlorine	IS:3025(P-26):1985, RA:2019:1986	*BLQ(**LOQ -2.0)	mg/l
4	Cyanide as CN	APHA 4500 CN -G	*BLQ(**LOQ -0.02)	mg/l
5	Aluminium as Al	IS 3025 (P-58) 2002, RA 2019	*BLQ(**LOQ -0.03)	mg/l

*BLQ - Below Limit Of Quantification, **LOQ - Limit Of Quantification

End of Report



Page No. 1/1

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Test Report

Sample Number : SKS/GW/01

Report No. : SKS/VV/2304240007/A

S.No.	Test Parameters	Test Method	Results	Units
19	Lead as Pb	APHA (23rd edition), 3030D, 3113B, 2017	*BLQ(**LOQ -0.05)	mg/l
20	Arsenic as As	APHA (23rd edition), 3030D, 3114C, 2017	*BLQ(**LOQ -0.005)	mg/l
21	Boron	APHA (23rd edition) 4660B, 2017	*BLQ(**LOQ -0.2)	mg/l
22	Cadmium as Cd	APHA (23rd edition), 3030D, 3113B, 2017	*BLQ(**LOQ -0.05)	mg/l
23	Selenium as Se	APHA (23rd edition), 3114C, 2017	*BLQ(**LOQ -0.005)	mg/l
24	Mercury as Hg	APHA (23rd edition), 3114C, 2017	*BLQ(**LOQ -0.001)	mg/l

*BLQ - Below Limit Of Quantification **LOQ - Limit Of Quantification

End of Report



Page No. 2/2

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4. Soil Samples Test Report



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Test Report

Sample Number :	SKS/SO06	Report No. :	SKS/SO/2304240006B
Name & Address of the Party :	M/s RDI - RDPL JV 175, Rajya Chikitsakarmi Colony, Chulapur, Bundi, (Rajasthan)	Format No. :	T.3 F-01
		Party Reference No. :	NL
Sample Description :	Soil Sample	Report Date :	04/05/2023
Location :	Batching Plant Near Meera Road	Period of Analysis :	24/04/2023-04/05/2023
Sample Collected by :	SKS Team (Mr. Ramesh Kalariya)	Receipt Date :	24/04/2023
Parameter Required :	As Per Work Order	Sampling Date :	21/04/2023
Sampling and Analysis Protocol :	SKSSTRGSS01	Sampling Quantity :	2 kg
		Sampling Type :	Composite
		Packing Status :	Temp. Sealed

S.No.	Parameters	Test method	Results	Units
1	Soil Texture	IS: 2720 (P-4) RA: 2005	Clay Loam	—
2	Permeability	IS: 2720(Part 17): 1986	0.0005	Cm/sec
3	Oil & Grease	EPA 9071 B	*BLQ/**LOQ - 0.5	mg/kg
4	Phosphate	IS 10613-1982 Reaffirmed 2003	21.86	kg/ha

*BLQ - Below Limit Of Quantification, **LOQ - Limit Of Quantification.

End of Report



Page No. 1/1

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Test Report

Sample Number : SKS/SO26

 Name & Address of the Party : M/s RGI - RBPL JV
 17B, Rajya Chikitsakarmi Colony, Chhatrapur, Bundi,
 (Rajasthan)

Report No. : SKS/SO2304140006A

Format No. : 7.3 F-01

Party Reference No. : NIL

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sampling Date : 21/04/2023

Sampling Quantity : 2 Kg

Sampling Type : Composite

Packing Status : Temp. Sealed

 Sample Description : Soil Sample
 Location : Batching Plant Near Meera Road
 Sample Collected by : SKS Team (Mr. Ramesh Kalariya)
 Parameter Required : As Per Work Order
 Sampling and Analysis Protocol : SKS/STPISO/SS/01

S No.	Parameters	Test method	Results	Units
1	pH	IS 2720 (P-26) : 1987	7.81	-
2	Available Nitrogen	IS 14684: 1999	340.70	kg/ha
3	Potassium (as K)	SKS/STPISO/01, Issue Date 01.07.2022: 2022	241.82	kg/ha
4	Electrical Conductivity	IS 14767: 2000	0.195	mS/cm
4	Calcium (as Ca)	SKS/STPISO/02, Issue No. 01, Issue Date 01.07.2022: 2022	18.37	mg/kg
5	Magnesium (as Mg)	SKS/STPISO/03, Issue No. 01, Issue Date 01.07.2022: 2022	7.21	mg/kg
7	Organic Matter	IS 2720 (P-22): 1973	0.37	%
8	Soil Moisture	SKS/STPISO/04, Issue No. 01, Issue Date 01.07.2022: 2022	1.54	%
9	Sodium (as Na)	USDA-1996 Method 12A (Page-06): 2010	86.91	mg/kg

*BLQ - Below Limit Of Quantification, **LOQ - Limit Of Quantification.

End of Report



Page No. 1/1

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Test Report

Sample Number :	SKS-S006	Report No. :	SKS/SO/2304240005/B
Name & Address of the Party :	M/s RGI - RBPL JV 17B, Raja Chhatrakarni Colony, Chhatrapur, (Bundi), (Rajasthan)	Format No :	7 & F-01
		Party Reference No :	Nil
		Report Date :	04/05/2023
Sample Description :	Soil Sample	Period of Analysis :	24/04/2023-04/05/2023
Location :	Narwa Road Magistrate Colony	Receipt Date :	24/04/2023
Sample Collected by :	SKS Team (Mr. Ramesh Katariya)	Sampling Date :	21/04/2023
Parameter Required :	As Per Work Order	Sampling Quantity :	1.2 Kg
Sampling and Analysis Protocol :	SKS/STR/SO/SS/01	Sampling Type :	Composite
		Packing Status :	Temp. Sealed

S. No.	Parameters	Test method	Results	Units
1	Soil Texture	IS: 2720 (P-4) RA: 2008	Clay Loam	—
2	Permeability	IS: 2720(Part 17): 1986	0.0008	Cm/sec
3	Oil & Grease	EPA 9071 B	"BLQ,""LOQ - 0.5"	mg/kg
4	Phosphorus	IS 15518-1982 Reaffirmed 2003	17.53	kg/ha

"BLQ" - Below Limit Of Quantification, "LOQ" - Limit Of Quantification

End of Report



Page No. 1/1

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YC-8652

Test Report

Sample Number : SKS/S005

 Name & Address of the Party : Mrs RGI - RBPL JV
 175, Raja Chakravarti Colony, Chhatrapur, Bunkh,
 (Rajasthan)

Sample Description : Soil Sample

Location : Nainwa Road Magistrate Colony

Sample Collected by : SKS Team (Mr. Ramesh Kataria)

Parameter Required : As Per Work Order

Sampling and Analysis Protocol : SKS/STP/S001

Report No. : SKS/S023042400050A

Format No. : T.S F-01

Party Reference No. : NIL

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sampling Date : 21/04/2023

Sampling Quantity : 2 Kg

Sampling Type : Composite

Packing Status : Temp. Sealed

S. No.	Parameters	Test method	Results	Units
1	pH	IS 2720 (P-28) : 1987	7.31	-
2	Available Nitrogen	IS 14854: 1999	318.36	kg/ha
3	Potassium (as K)	SKS/STP/S001, Issue Date 01.07.2022: 2022	214.85	kg/ha
4	Electrical Conductivity	IS 14797: 2000	0.225	ms/cm
5	Calcium (as Ca)	SKS/STP/S002, Issue No. 01, Issue Date 01.07.2022: 2022	45.88	mg/kg
6	Magnesium (as Mg)	SKS/STP/S003, Issue No. 01, Issue Date 01.07.2022: 2022	6.10	mg/kg
7	Organic Matter	IS 2720 (P-22): 1972	0.38	%
8	Soil Moisture	SKS/STP/S004, Issue No. 01, Issue Date 01.07.2022: 2022	1.39	%
9	Sodium (as Na)	USDA:1954 Method 10A (Page-96): 2010	85.33	mg/kg

*BLQ - Below Limit Of Quantification, **LOQ - Limit Of Quantification

End of Report



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Test Report

Sample Number : SKS/SG/04

Name & Address of the Party : M/s RGI - RBPL JV

 176, Raja Chakrasarm Colony, Chhatpur, Bandi,
(Rajasthan)

Report No. : SKS/SG/2204240004/B

Format No : 7.8 F-01

Party Reference No : Nil

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sampling Date : 21/04/2023

Sampling Quantity : 2 Kg.

Sampling Type : Composite

Packing Status : Temp. Sealed

Sample Description : Soil Sample

Location : Bharat Petrol Pump (Devpura)

Sample Collected by : SKS Team (Mr. Ramesh Katariya)

Parameter Required : As Per Work Order

 Sampling and Analysis
Protocol : SKS/STP/SG/SG/01

S.No.	Parameters	Test method	Results	Units
1	Soil Texture	IS: 2720 (P-4) RA: 2006	Clay Loam	—
2	Permeability	IS: 2720(Part 17): 1986	0.0007	Cm/sec
3	Oil & Grease	EPA 8071 B	*BLQ**LOQ - 9.5	mg/kg
4	Phosphate	IS 10518-1982 Reaffirmed 2003	20.23	kg/he

*BLQ - Below Limit Of Quantification, **LOQ - Limit Of Quantification.

End of Report



Page No. 1/1

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TC-0052

Test Report

Sample Number : SKS/ISO/04

Name & Address of the Party : M/s RGI - RBPL JV

 17B, Rajya Chikitsakami Colony, Chaturpur, Bundi,
(Rajasthan)

Report No. : SKS/ISO/23042402004A

Format No : 7.3 F-01

Party Reference No : Nil

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sampling Date : 21/04/2023

Sampling Quantity : 2 Kg

Sampling Type : Composite

Packing Status : Term: Sealed

Sample Description : Soil Sample

Location : Bharat Petrol Pump (Deopura)

Sample Collected by : SKS Team (Mr. Ramesh Kataria)

Parameter Required : As Per Work Order

 Sampling and Analysis
Protocol : SKS/STP/ISO/SS/01

S.No.	Parameters	Test method	Results	Units
1	pH	IS 2720 (P-28) : 1987	6.91	-
2	Available Nitrogen	IS 14884: 1999	328.48	kg/ha
3	Potassium (as K)	SKS/STP/ISO/01, Issue Date 01.07.2022: 2022	230.51	kg/ha
4	Electrical Conductivity	IS 14767: 2008	0.210	ms/cm
5	Calcium (as Ca)	SKS/STP/ISO/02, Issue No. 01, Issue Date 01.07.2022: 2022	27.41	mg/kg
6	Magnesium (as Mg)	SKS/STP/ISO/03, Issue No. 01, Issue Date 01.07.2022: 2022	7.76	mg/kg
7	Organic Matter	IS 2720 (P-22): 1972	0.37	%
8	Soil Moisture	SKS/STP/ISO/04, Issue No. 01, Issue Date 01.07.2022: 2022	1.74	%
9	Sodium (as Na)	USDA:1954 Method 10A (Page-96): 2018	94.91	mg/kg

*BLQ - Below Limit Of Quantification, **LOQ - Limit Of Quantification

End of Report



Page No. 1/1

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Test Report

Sample Number : SKS/SO/03

Name & Address of the Party : M/s RGI - RISP, JV

 176, Rajya Chikitsakami Colony, Chhatrapur, Bundi
(Rajasthan)

Report No. : SKS/SO/2024/0005/B

Format No : T-8 F-01

Party Reference No : NIL

Report Date : 04/03/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sampling Date : 21/04/2023

Sampling Quantity : 2 Kg

Sampling Type : Composite

Packing Status : Temp. Sealed

 Sample Description : Soil Sample
 Location : City Road Police Thana Bundi
 Sample Collected by : SKS Team (Mr. Ramesh Katariya)
 Parameter Required : As Per Work Order
 Sampling and Analysis Protocol : SKS/STR/SO/SS/01

S.No.	Parameters	Test method	Results	Units
1	Soil Texture	IS: 2720 (P-4) RA: 2806	Clay Loam	-
2	Permeability	IS: 2720(Part 17): 1988	0.0006	Cm/sec
3	Oil & Grease	EPA 8071 B	*BLQ**LOQ - 0.5	mg/kg
4	Phosphate	IS 10058-1982 Reaffirmed 2003	19.10	kg/ha

*BLQ - Below Limit Of Quantification,**LOQ - Limit Of Quantification

End of Report



Page No. 1/1

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Test Report

Sample Number : SKS/50/03

Name & Address of the Party : M/s RQI - RBPL JV

 17B, Raju Chaitrakarni Colony, Chhatrapur, Banti,
(Rajasthan)

Sample Description : Soil Sample

Location : City Kotwali Potta Thana Bandi

Sample Collected by : SKS Team (Mr. Ramesh Kataria)

Parameter Required : As Per Work Order

Sampling and Analysis Protocol : SKS/STP/ISO/ISS/01

Report No. : SKS/50/2304240003/A

Format No : 7.3 F-01

Party Reference No : NIL

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sampling Date : 21/04/2023

Sampling Quantity : 2 Kg.

Sampling Type : Composite

Packing Status : Temp. Sealed

S.No.	Parameters	Test method	Results	Units
1	pH	IS 2720 (P-26) : 1987	7.41	-
2	Available Nitrogen	IS 14584: 1995	310.22	kg/ha
3	Potassium (as K)	SKS/STP/ISO/01, Issue Date 01.07.2022: 2022	101.39	kg/ha
4	Electrical Conductivity	IS 14767: 2000	0.190	mS/cm
5	Calcium (as Ca)	SKS/STP/ISO/02, Issue No. 01, Issue Date 01.07.2022: 2022	27.41	mg/kg
6	Magnesium (as Mg)	SKS/STP/ISO/03, Issue No. 01, Issue Date 01.07.2022: 2022	4.99	mg/kg
7	Organic Matter	IS 2720 (P-22): 1972	0.48	%
8	Soil Moisture	SKS/STP/ISO/04, Issue No. 01, Issue Date 01.07.2022: 2022	1.45	%
9	Sodium (as Na)	USDA:1954 Method 10A (Page-06): 2010	91.56	mg/kg

*BLQ - Below Limit Of Quantification, **LOQ - Limit Of Quantification

End of Report



Page No. 1/1

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Test Report

Sample Number : SKS/SG/02

Name & Address of the Party : M/s RGI - RBIPL JV

 176, Raja Chikisakam Colony, Chhatrapur, Sundi,
(Rajasthan)

Sample Description : Soil Sample

Location : Jait Sagar Nalla Near Meera Bagh Chokri

Sample Collected by : SKS Team (Mr. Ramesh Katariya)

Parameter Required : As Per Work Order

Sampling and Analysis Protocol : SKS/STP/SG/SS/01

Report No. : SKS/SG/0304240002/B

Format No : 7.8 F-01

Party Reference No : NIL

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sampling Date : 21/04/2023

Sampling Quantity : 2 Kg

Sampling Type : Composite

Packing Status : Temp. Sealed

S.No.	Parameters	Test method	Results	Units
1	Soil Texture	IS: 2720 (P-4) RA: 2006	Clay Loam	—
2	Permeability	IS: 2720(Part 17): 1986	0.0008	Cm/sec
3	Oil & Grease	EPA 9071 B	*BLQ**LOQ - 0.6	mg/kg
4	Phosphat	IS 10516:1982 Reaffirmed 2003	20.11	kg/ha

*BLQ - Below Limit Of Quantification, **LOQ - Limit Of Quantification

End of Report



Page No. 1/1

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Test Report

Sample Number : SKS/SD/02

 Name & Address of the Party : M/s RQI - RBPL JV
 176, Rajya Chhaskarmi Colony, Chhatrapur, Bundi
 (Rajasthan)

Sample Description : Soil Sample

Location : Jait Sagar Nalla Near Meera Bagh Chokli

Sample Collected by : SKS Team (Mr. Ramesh Katariya)

Parameter Required : As Per Work Order

Sampling and Analysis Protocol : SKS/STP/ISO/SS/01

Report No. : SKS/SD/2023/04/002/A

Format No : 7.8 F-01

Party Reference No : NIL

Report Date : 04/05/2023

Period of Analysis : 04/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sampling Date : 21/04/2023

Sampling Quantity : 2 Kg

Sampling Type : Composite

Packing Status : Temp. Sealed

S.No.	Parameters	Test method	Results	Units
1	pH	IS 3720 (P-26) : 1987	7.21	-
2	Available Nitrogen	IS 14884 : 1999	315.53	kg/ha
3	Potassium (as K)	SKS/STP/ISO/01, Issue Date 01.07.2022: 2022	178.44	kg/ha
4	Electrical Conductivity	IS 14767 : 2000	0.185	mS/cm
5	Calcium (as Ca)	SKS/STP/ISO/02, Issue No. 01, Issue Date 01.07.2022: 2022	9.13	mg/kg
6	Magnesium (as Mg)	SKS/STP/ISO/03, Issue No. 01, Issue Date 01.07.2022: 2022	6.65	mg/kg
7	Organic Matter	IS 3720 (P-32) : 1972	0.28	%
8	Soil Moisture	SKS/STP/ISO/04, Issue No. 01, Issue Date 01.07.2022: 2022	1.43	%
9	Sodium (as Na)	USDA:1954 Method 10A (Page-96): 2010	80.98	mg/kg

*BLO - Below Limit Of Quantification, **LOQ - Limit Of Quantification

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Page No. 1/1

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Test Report

Sample Number : SKS/SO/01
 Name & Address of the Party : M/s RGI - RBPL JV
 179, Rajya Chikitsakans Colony, Chhatrapur, Bardi,
 (Rajasthan)
 Sample Description : Soil Sample
 Location : Jail Sagar Nalla Near Arrival Marriage Garden
 Sample Collected by : SKS Team (Mr. Himesh Kataria)
 Parameter Required : As Per Work Order
 Sampling and Analysis Protocol : SKS/STP/SO/SO/01

Report No. : SKS/SG/2304240001/B
 Format No : 7.8 F-01
 Party Reference No : Nil
 Report Date : 04/05/2023
 Period of Analysis : 24/04/2023-04/05/2023
 Receipt Date : 24/04/2023
 Sampling Date : 21/04/2023
 Sampling Quantity : 2 Kg
 Sampling Type : Composite
 Packing Status : Temp. Sealed

S.No.	Parameters	Test method	Results	Units
1	Soil Texture	IS: 2720 (P-4) RA: 2008	Clay Loam	-
2	Permeability	IS: 2720(Part 17): 1986	3.0084	Cm/sec
3	Oil & Grease	EPA 8071 B	*BLQ/**LOQ - 0.6	mg/kg
4	Phosphorus	IS 16618-1982 Reaffirmed 2003	15.75	kg/ha

*BLQ - Below Limit Of Quantification. **LOQ - Limit Of Quantification.

End of Report



Page No. 1/1

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Test Report

Sample Number : SKS/SD/01

Name & Address of the Party :

 M/s RGI - RSPL JV
 175, Raja Chittasakarni Colony, Chaturpur, Bund,
 (Rajasthan)

Report No. : SKS/SD/35424001/A

Format No : 7.8 F-01

Party Reference No : NIL

Report Date : 04/05/2023

Period of Analysis : 24/04/2023-04/05/2023

Receipt Date : 24/04/2023

Sampling Date : 21/04/2023

Sampling Quantity : 2 Kg.

Sampling Type : Composite

Packing Status : Temp-Sealed

Sample Description : Soil Sample

Location : Jai Sagar Nalla near Anwal Marriage Garden

Sample Collected by : SKS Team (Mr. Ramesh Katariya)

Parameter Required : As Per Work Order

Sampling and Analysis Protocol : SKS/STP/SD/SS/01

S.No.	Parameters	Test method	Results	Units
1	pH	IS 2720 (P-28) : 1987	7.91	-
2	Available Nitrogen	IS 14884: 1999	502.54	kg/ha
3	Potassium (as K)	SKS/STP/SD/01, Issue Date 01.07.2022: 2022	180.39	kg/ha
4	Electrical Conductivity	IS 14767: 2008	0.190	mS/cm
5	Calcium (as Ca)	SKS/STP/SD/02, Issue No. 01, Issue Date 01.07.2022: 2022	15.28	mg/kg
6	Magnesium (as Mg)	SKS/STP/SD/03, Issue No. 01, Issue Date 01.07.2022: 2022	3.88	mg/kg
7	Organic Matter	IS 2720 (P-22): 1972	0.31	%
8	Soil Moisture	SKS/STP/SD/04, Issue No. 01, Issue Date 01.07.2022: 2022	1.03	%
9	Sodium (as Na)	USDA:1994 Method 10A (Page-96): 2010	110.55	mg/kg

*BLO - Below Limit Of Quantification, **LOQ - Limit Of Quantification

End of Report



Page No. 1/1

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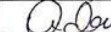
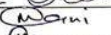
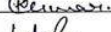
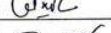
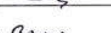
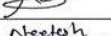
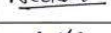
Appendix 9: Induction cum Orientation Safety Training Programme for Contactors & Technical personals

Induction cum Orientation Safety Training Programme for Contactors & Technical personals was organised on 05.06.2023 for various EMP provision, employment, Health and Safety standards and compliances. Training was imparted by Environmental Safeguards Personnel of CMSC-01, Jaipur and was attended by contractor's employees as well as technical staff of PIU. Various provision, requirements and compliances regarding Environment Health and Safety were discussed in detail. Photographs and attendance of training are attached below:



Attendance Sheet

Rajasthan Secondary Town Development Sector Project (RSTDSP-Ph-IV)
Attendance Sheet of Environment Safeguard Training

S.No.	Date/Time	Location	Name	Designation	Signature
1.	05.06.23	S.T.P; Bundi	Dileep kr sharma	GE	
2	05-06-23	STP; Bundi	Vandana Srivastava	Environmental Safety and Health Safeguard Support (Env. & Safety)	
3.	05.06.2023	STP; Bundi	Mani Kumar.	(Env. & Safety)	
4.	05.06.2023	STP; Bundi	LAL SINGH	Planning Engineer	
5.	05.06.2023	RUIDP office	Saurav Sharma	SOT	
06.	05.06.2023	Ruidp office	Ashutosh Kumar	EMS KPL	
07.	05.06.2023	Ruidp office	Anoop Kumar	Site Eng.	
08	05.06.2023	Ruidp office	BHERU LAL	Support Engineer	
09.	05.06.2023	RUIDP OFFICE, BUNDI	Manish Barashah	Support Engineer	
10.	05/06/2023	RUIDP office, Bundi	Neelkesh Dwivedi	Support Eng.	
11	5/06/2023	RUIDP office-Bundi	Vijay Pareek	Support Eng.	
12	5/06/2023	STP; Bundi	Laxmi meena	SOT	
13	5/6/2023	STP; Bundi	babeesa Jangid	SOT	

Rajasthan Secondary Town Development Sector Project (RSTDSP-Ph-IV)
Attendance Sheet of Environment Safeguard Training

[illegible]

Initial Environmental Examination

PUBLIC

Document Stage: Updated
Project Number: 42267-034
January 2024

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

Bundi Storm Water Drainage

Prepared by Rajasthan Urban Infrastructure Development Project, Government of Rajasthan for the Asian Development Bank (ADB). This is an updated version of the draft originally posted in March 2023 available on <https://www.adb.org/projects/documents/ind-42267-034-iee-8>

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APPENDICES:

Appendix C-1: Drinking Water Standards	1
Appendix C-2: Ambient Air Quality Standards	2
Appendix C-3: Emission limits for New DG sets up to 800 KW	4
Appendix C-4: Stack Height Requirement of DG set	5
Appendix C-5: Vehicle Exhaust Emission Norms	6
Appendix C-6: Ambient Noise Quality Standards	7
Appendix C-7: Noise Limits for DG Set	8
Appendix C-8: Effluent Discharge Standards for Sewage Treatment Plant	10
Appendix C-9: Pages from Rajasthan State Sewerage and Waste Water Policy for reuse of treated effluent and sludge	11
Appendix C-10: Guidelines for Reuse of Treated Effluent and Sludge from STP for Beneficial Purposes	15
Appendix C-11: Guidelines for compensatory tree plantation in RUIDP works	19
Appendix C-12: Salient Features of Laws applicable to Construction Works including Labor Laws	21
Appendix C-13: Sample Outline Spoil Management Plan	25
Appendix C-14: Sample Outline Traffic Management Plan	26
Appendix C-15: Sample Six Monthly Reporting Format	36
Appendix C-16: Sample Environmental Site Inspection Report	39
Appendix C-17: Sample Grievance Registration Form	41
Appendix C-18: Management Plan for Night works at Project Sites	42
Appendix C-19: Guidelines for Safety during Monsoon/Heavy rainfall	44
Appendix C-20: Sample ACM Management Plan	46
Appendix C-21: Guidelines for Workers Camps	72
Appendix C-22: Guidelines for Safety in Chlorine Usage	74
Appendix C-23: Guidelines for Prevention and Control of COVID-19	81
Appendix C-24: RUDSICO-EAP Guidelines for implementation of Prevention and Control Measures for COVID-19	87
Appendix C-25: Management of Work Plan during Festivals and Melas	100

Appendix C-1: Drinking Water Standards

Group	National Standards for Drinking Water ^a			WHO Guidelines for Drinking-Water Quality, 4 th 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 ($\mu\text{g}/\text{m}^3$)	WHO Air Quality Guidelines ($\mu\text{g}/\text{m}^3$)		Applicable Per ADB SPS ^e ($\mu\text{g}/\text{m}^3$)
			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 (µg/m ³)	WHO Air Quality Guidelines (µg/m ³)		Applicable Per ADB SPS ^e (µg/m ³)
			Global Update ^c 2005	Second Edition 2000	
	Sensitive Area	100 (Annual) 400 (24-hr)			100 (Annual) 400 (24-hr)
Benzene (C ₆ H 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 :

$$H = h + 0.2 \times \text{KVA}$$

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

STATE SEWERAGE AND WASTE WATER POLICY- 2016

- 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 requirements 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 ailments 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 helminthiasis 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 floors 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 superfluous 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 fixed 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 first 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: 3.04.2018

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.

Circular 10

 1

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.

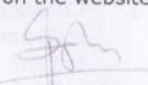

(Dr. Preetam B Yashvant)
Project Director

No. F3 (201)(57)/RUIDP/PMU/Ph-III/CMS/ 557-91

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 bury 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 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

(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 as an 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

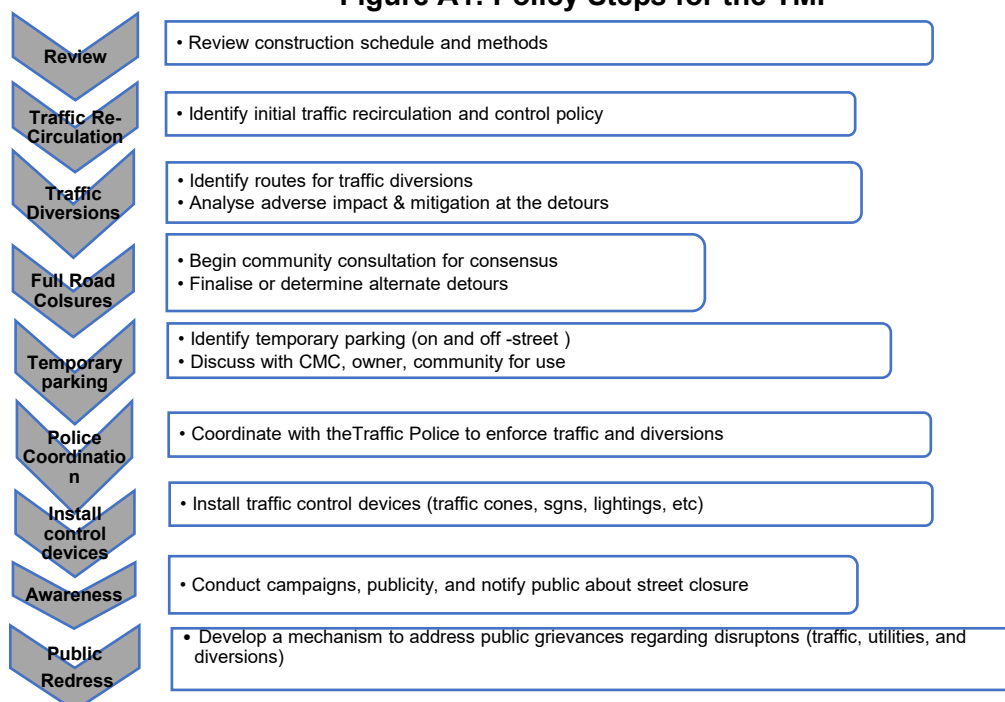
4. Apart from the capacity analysis, a final decision to close a particular street and divert the traffic should involve the following steps:

- 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. Flaggers/ 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

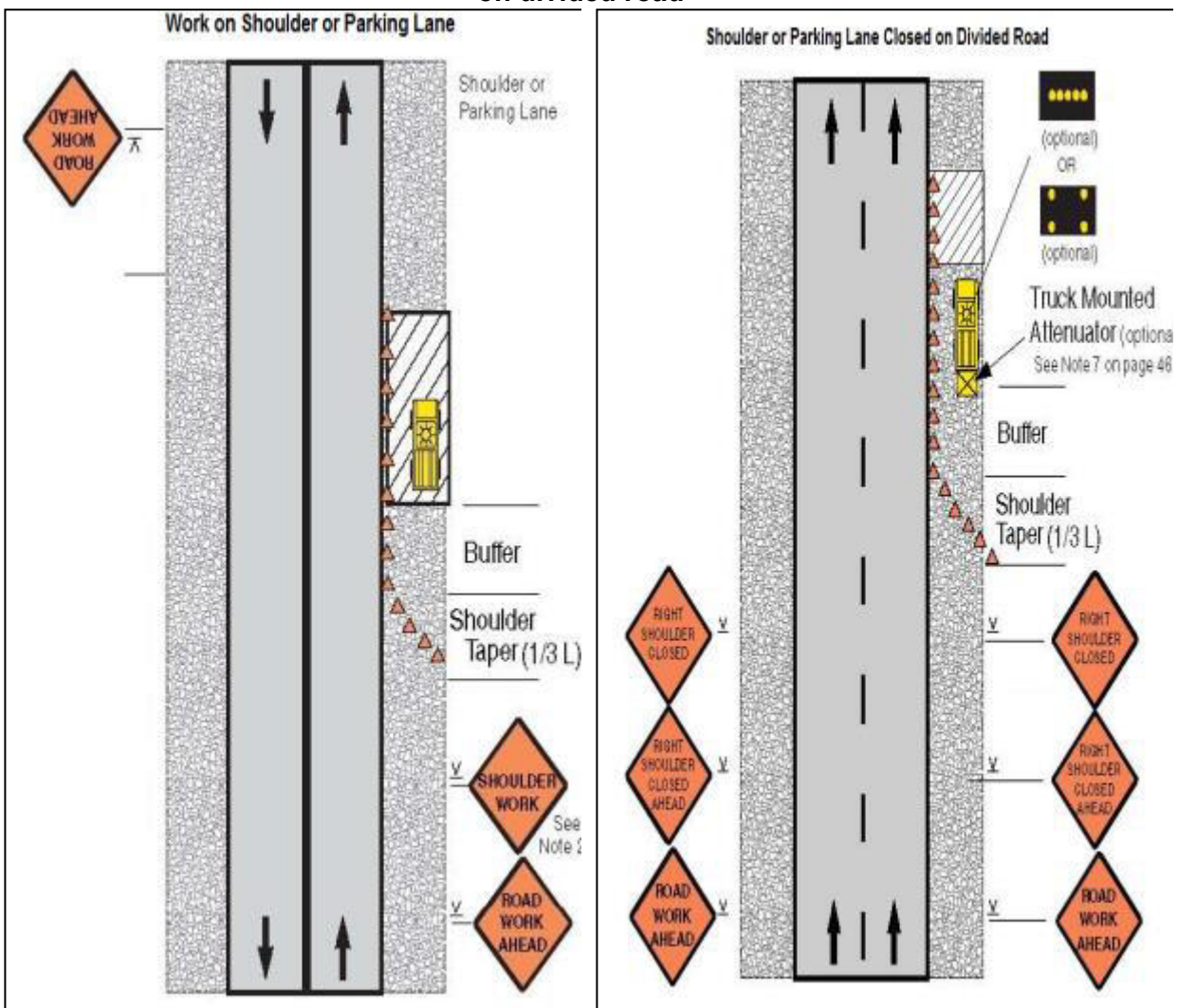


Figure A4 & A5: Work in Travel Lane & Lane closure on road with low volume

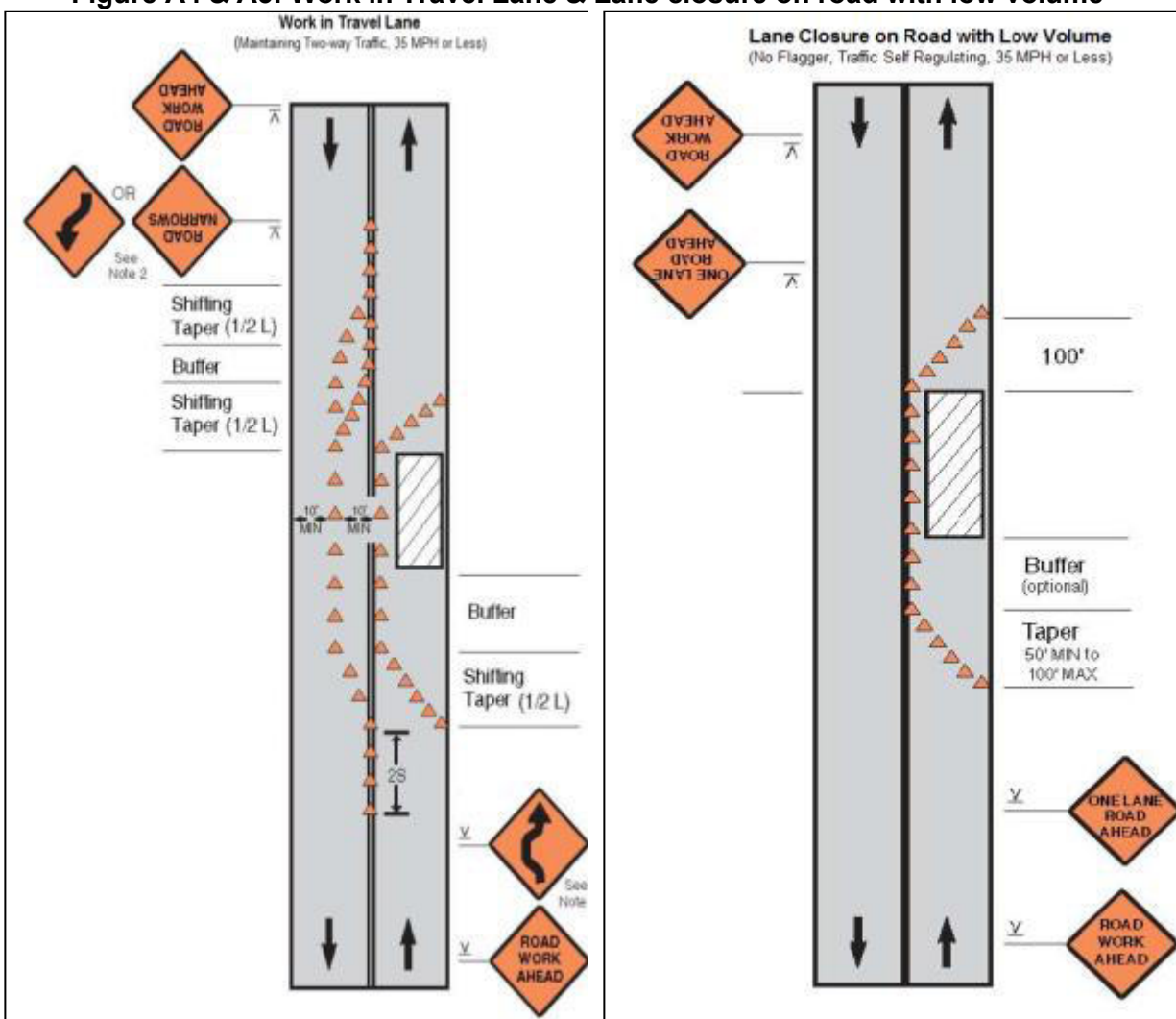


Figure A6 & A7: Lane closure on a two-line road with low volume (with yield sign) & Lane closure on a two-line road with low volume (one flagger operation)

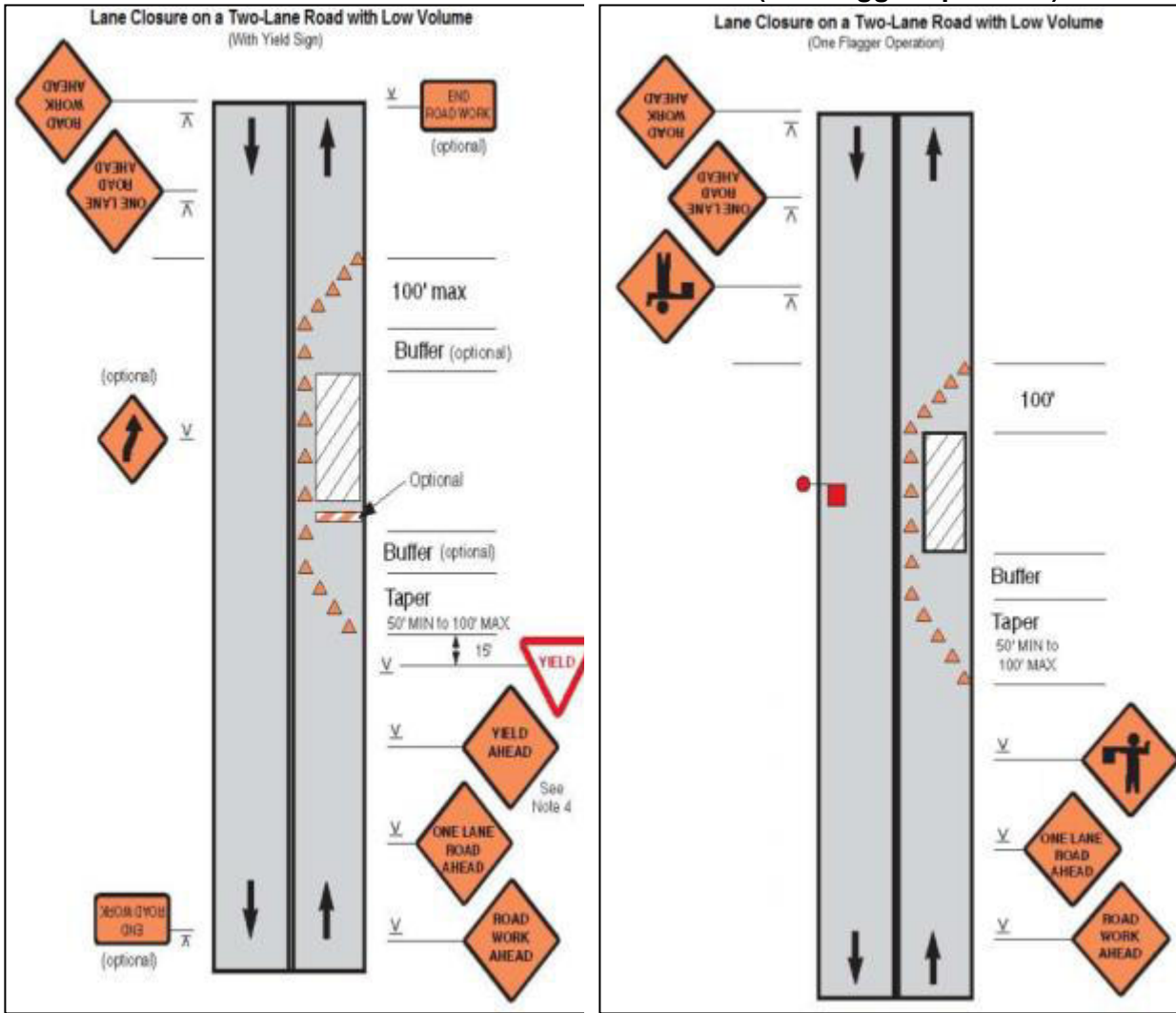


Figure A8 & A9: Lane Closure on a Two-Lane Road (Two Flagger Operation) & Lane Closure on a Four-Lane Undivided Road

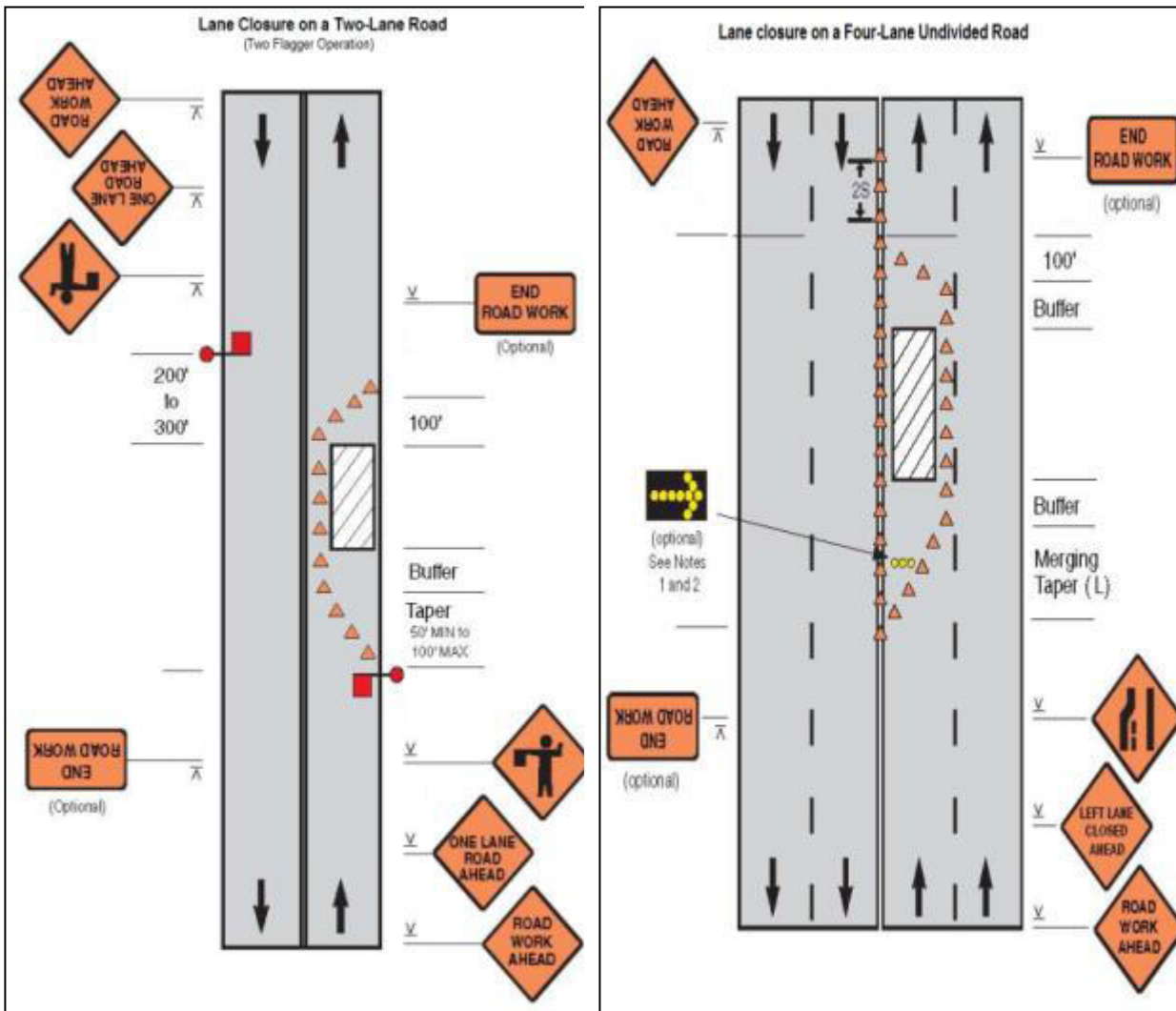


Figure A10 & A11: Lane Closure On Divided Roadway & Half Road Closure On Multi-Lane Roadway

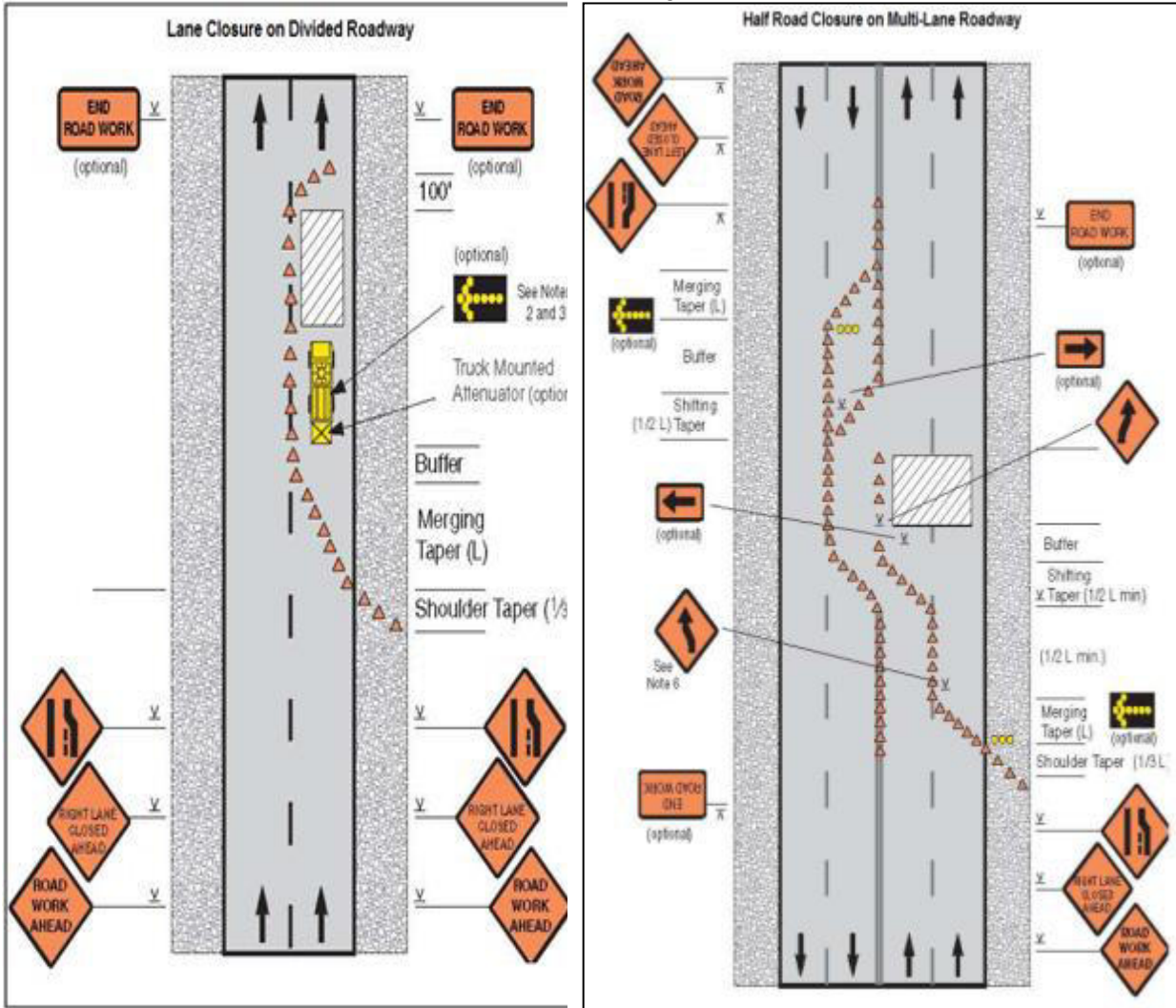
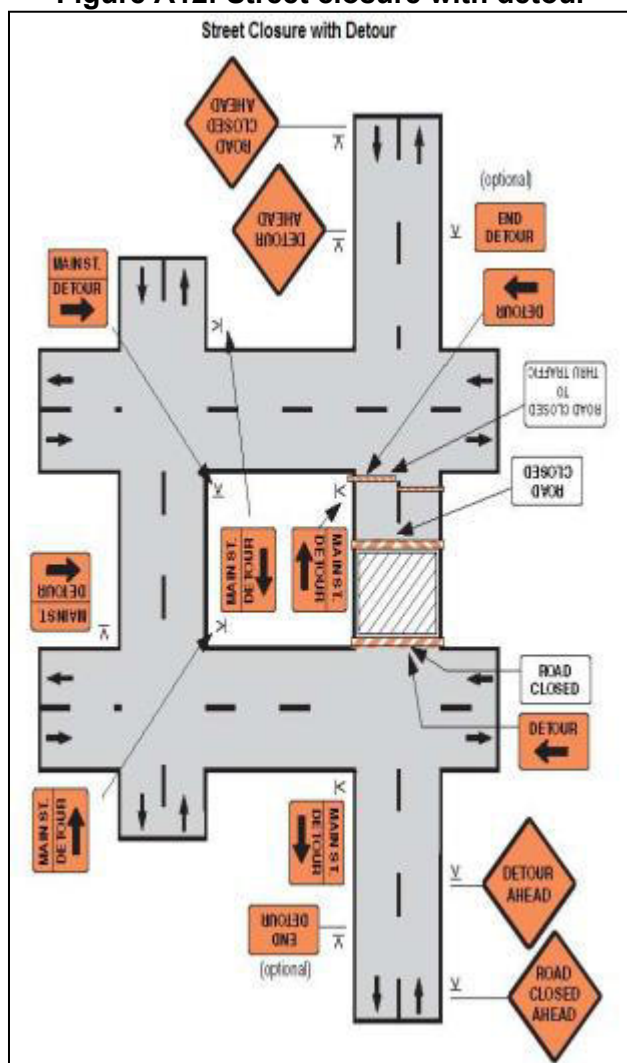


Figure A12: Street closure with detour

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.	Sub-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	Statutory 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	Standards (Government Standards)			
			PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³

Water Quality Results

Site No.	Date of Sampling	Site Location	Parameters(Government Standards)					
			pH	Conductivity μS/cm	BODm g/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 /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 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.

	 Full-face positive-pressure airline respirator (includes eye protection)* Disposable overalls with hood Gloves with wrists taped Wear large size overalls for a roomy fit Non-laced safety footwear with disposable slippers over
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

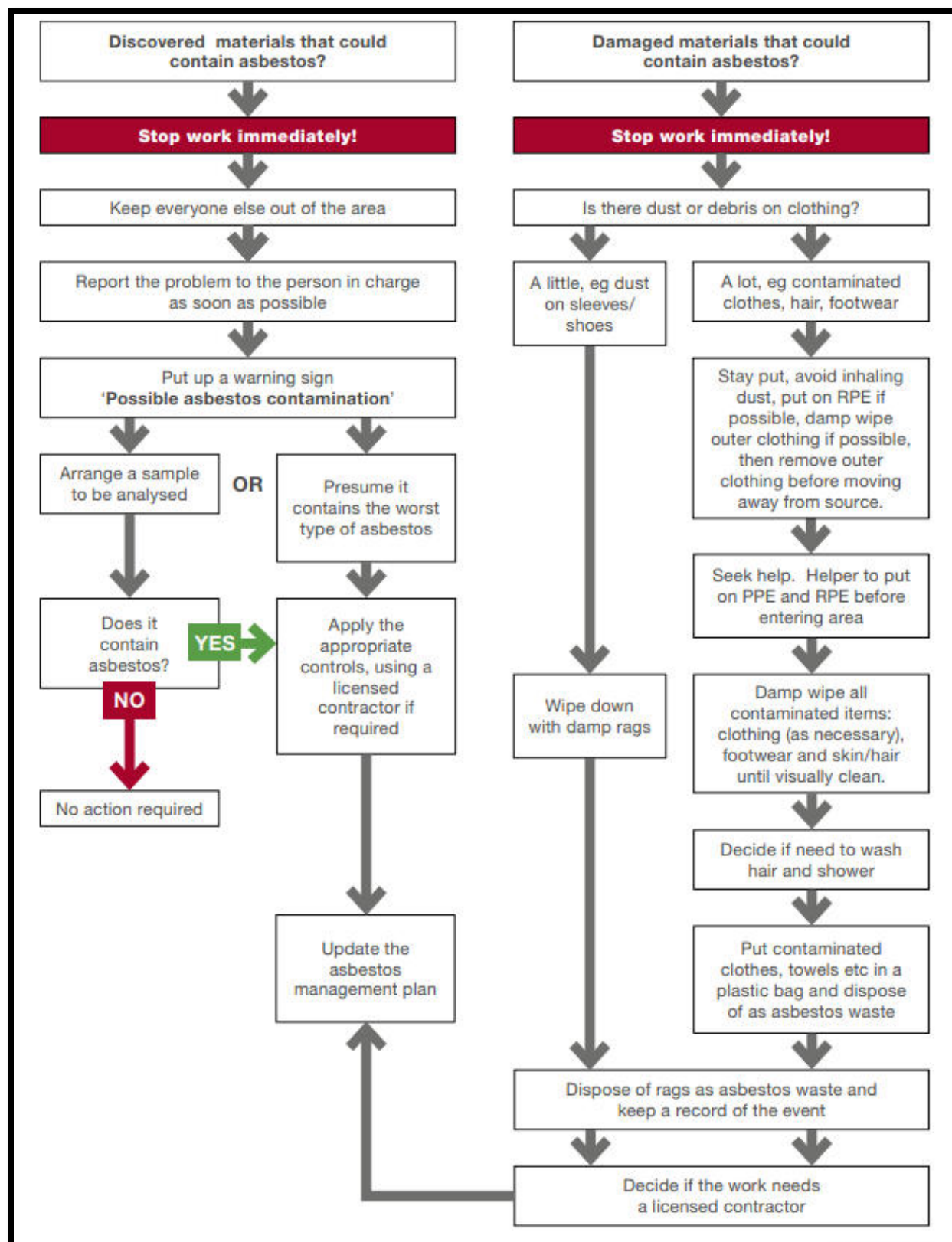


Fig.No.1-Showing Flow chart of ERP

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

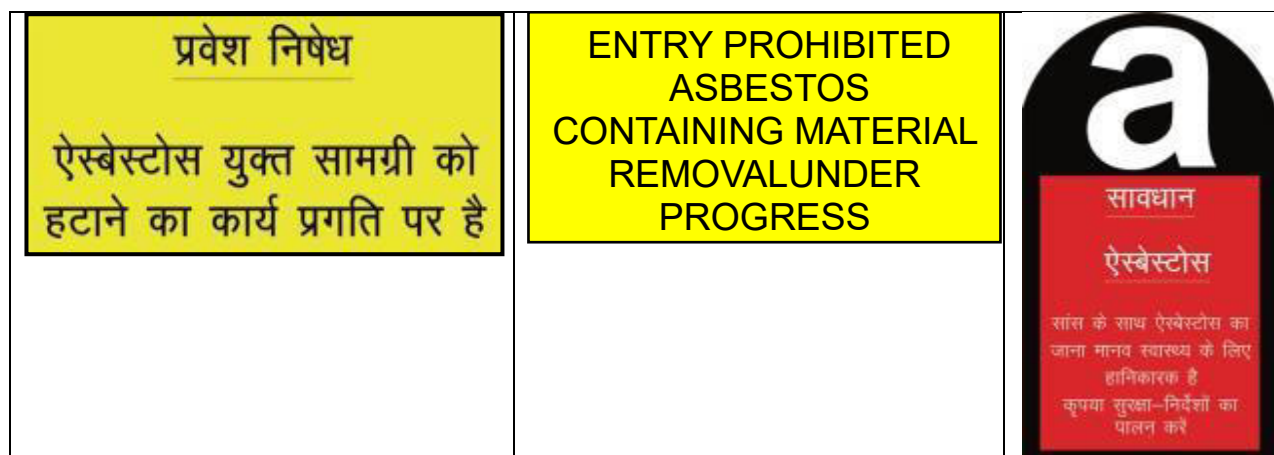


Fig. 2 Asbestos warning signage

- 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:

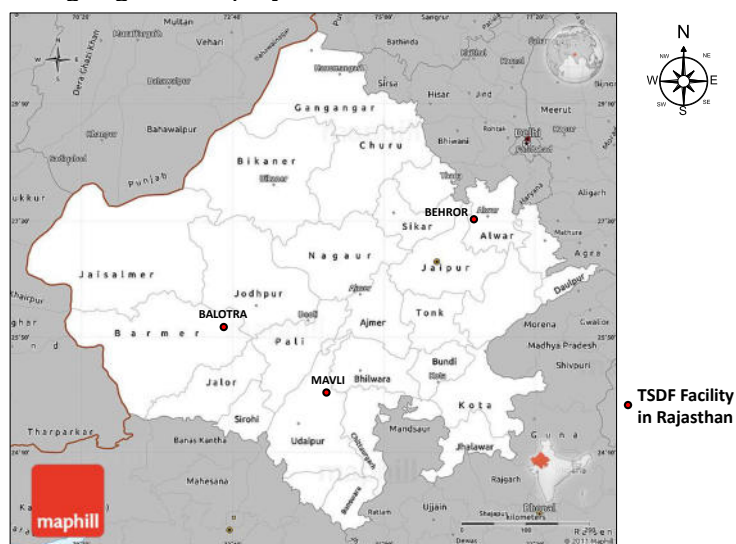


Fig 4: Map of the locations of approved TSDF in Rajasthan.

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.

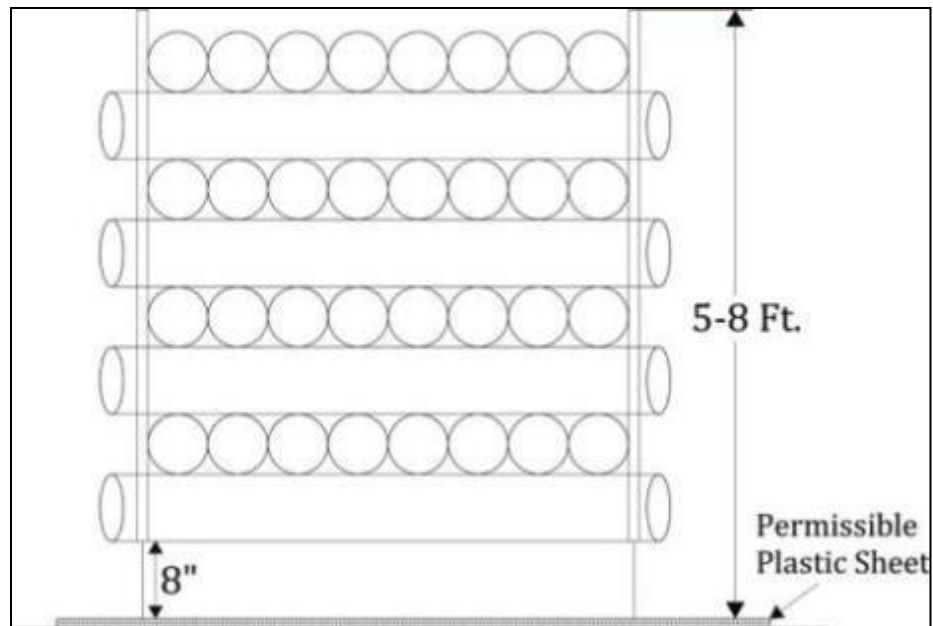


Fig. 5: Schematic diagram showing ACM Pipes stacking

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.

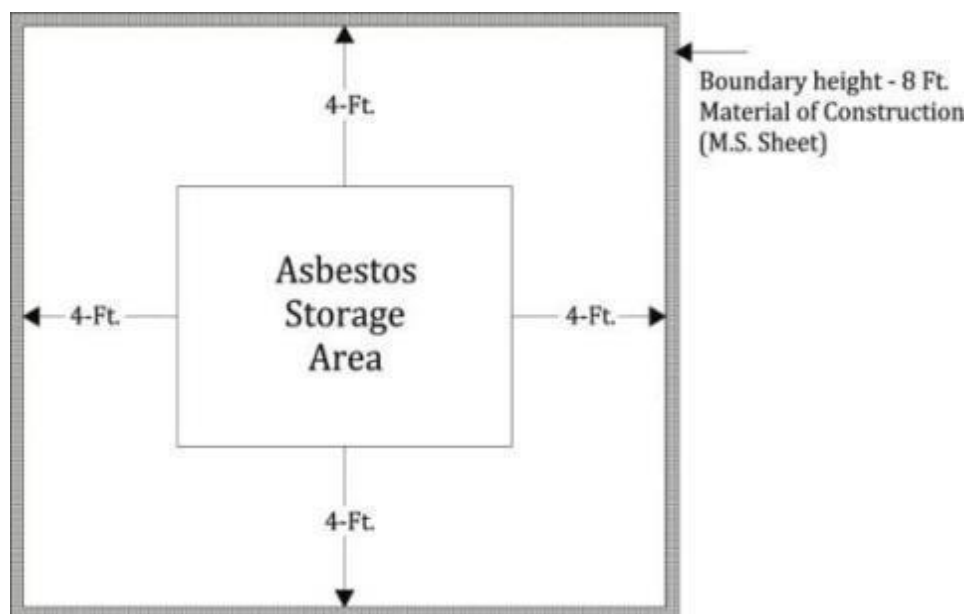


Fig. 6: Schematic diagram showing ACM Pipes storage area

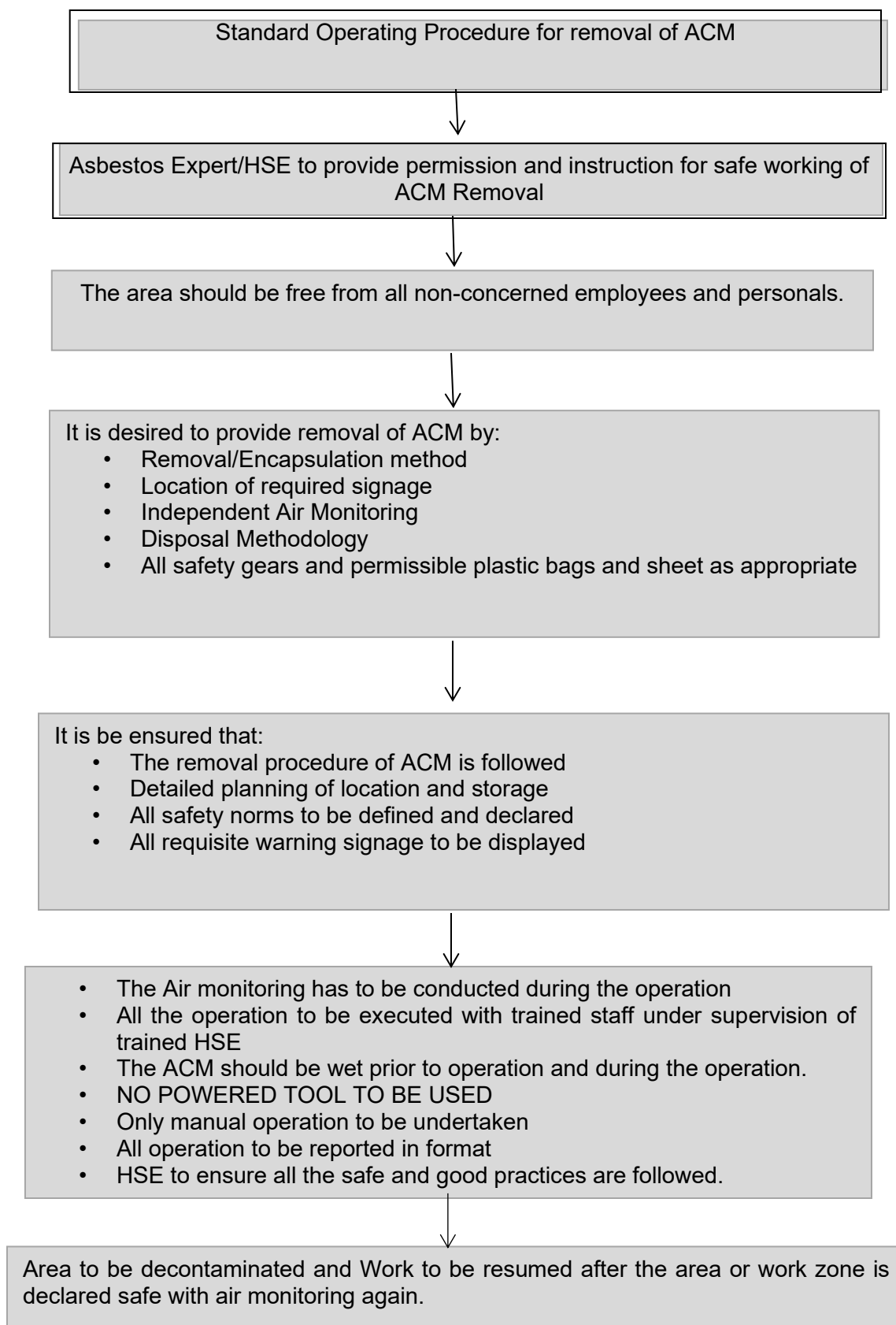


Fig. 6 -Standard Operating Procedure Flow Sheet

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 habitation, 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/Nm ³ . 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 should be 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 – ASBESTOS 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 CONTRACTOR/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& Norms	Permissible
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/D BO	Address/ Contact details:	Period of Employment/ Job Title	Pre-History	Doctor's comments	HSE Remarks
					Height		
					Weight/B MI		
					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 of Containers	•		m ³ or MTNos.
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										
1			Receiver's certification for receipt of hazardous and other waste											
6.	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 habitation. • 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 mm²

a= graticule counting area in mm²,

r= flow rate of air through filter in cm³/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 Convention¹, 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 ☐ Peritoneal mesothelioma ☐ 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 ☐ Peritoneal mesothelioma ☐ 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 mesothelioma ☐ 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.

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)

1.1 Storage 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. In case 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 fluoroprotein 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



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.^{3,6} 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 days⁹ at 23°C to 2 weeks¹⁰ 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 ≥ 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).²⁵ 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 precautions¹⁸ 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 bedside 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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US Centers for Disease Control and Prevention, United States of America; David Berendes, US Centers for Disease Control and Prevention, United States of America; Lisa Casanova, Georgia State University, United States of America; David Cunliffe, SA Health, Australia; Rick Gelting, US Centers for Disease Control and Prevention, United States of America; Dr Thomas Handzel, US Centers for Disease Control and Prevention, United States of America; Paul Hunter, University of East Anglia, United Kingdom; Ana Maria de Roda Husman, National Institute for Public Health and the Environment, the Netherlands; Peter Maes, Médecins Sans Frontières, Belgium; Molly Patrick, US Centers for Disease Control and Prevention, United States of America; Mark Sobsey, University of North Carolina-Chapel Hill, United States of America.

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.

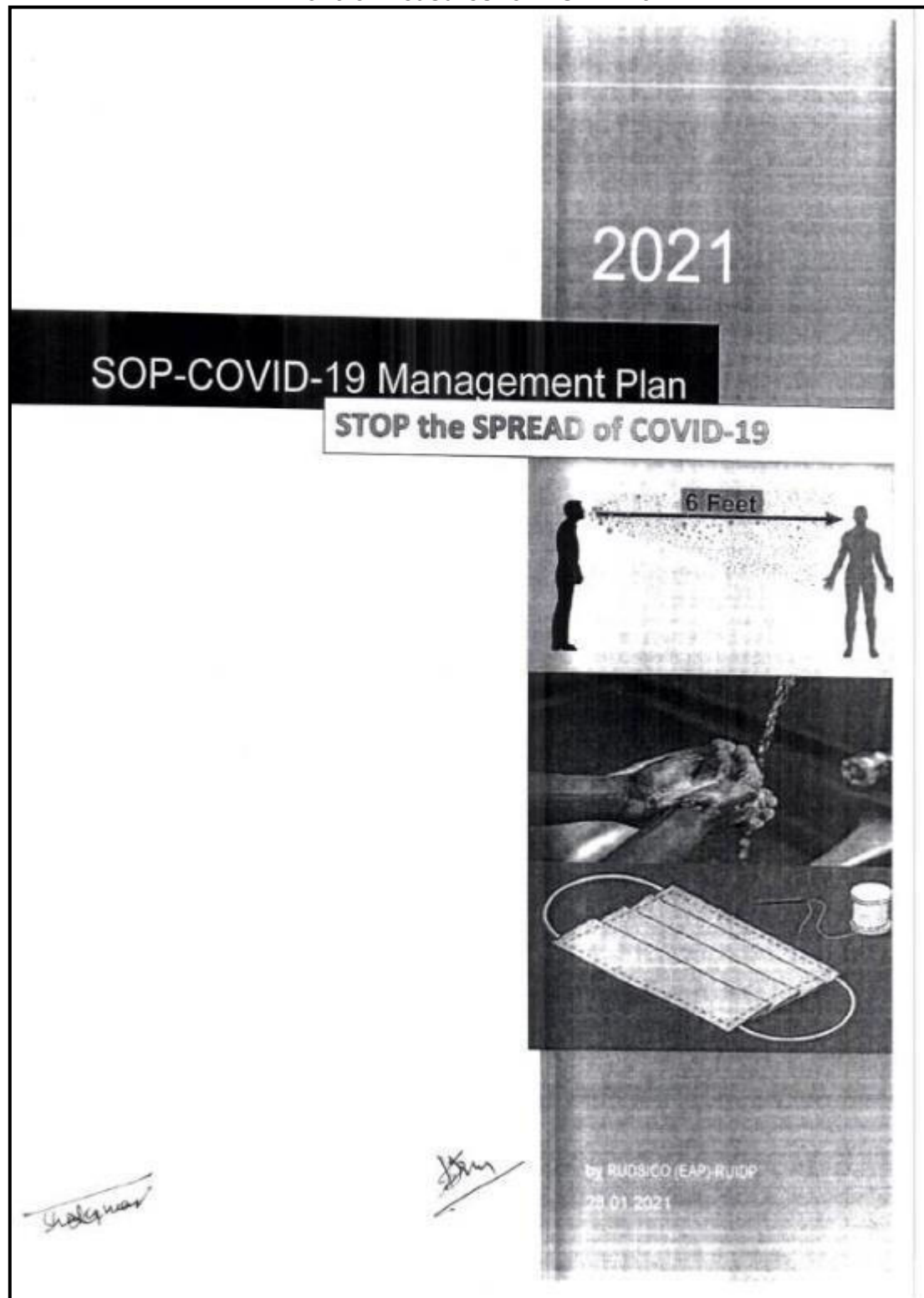
Contributors

This interim guidance was written by staff from WHO and UNICEF. In addition, a number of experts and WASH practitioners contributed. They include Matt Arduino,

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Appendix C-24: RUDSICO-EAP Guidelines for implementation of Prevention and Control Measures for COVID-19



Safe Operating Procedures (SOP) and COVID-19 Management Plan for Construction works

Contents

I.INTRODUCTION.....	3
II.PURPOSE.....	3
III.COVID-19 TYPICAL SYMPTOMS.....	4
IV.PRINCIPLES OF WORKER PROTECTION.....	4
V.MAXIMUM PRECAUTION FOR PERSONS/LABOURERS REPORTING TO WORK.....	4
VI.PPEs AND SANITIZATION ARRANGEMENTS.....	4
VII.HEALTH CHECK UP AND THERMAL SCANNING.....	4
VIII.SELF ATTESTATION BY PERSONS/LABOUR PRIOR TO WORK.....	5
IX.GENERAL PRECAUTIONS TO BE FOLLOWED AT PERMANENT SITES/OFFICES.....	5
X.TEMPORARY WORK-SITE (PIPE LAYING SITES) PREVENTION PRACTICES.....	6
XI.WASHING FACILITY.....	7
XII.CLEANING PROCEDURES.....	7
XIII.LABOUR CAMP.....	8
Toilet Facility.....	8
Eating/snacks Arrangements.....	8
Changing Facilities, Bathrooms, Showers and Drying Areas.....	9
XIV.UPDATES ON COVID-19.....	9
XV.TRAINING.....	9
XVI.EMERGENCY CONTACT.....	9

Safe Operating Procedures (SOP) and COVID-19 Management Plan for Construction works

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 document¹ 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 Officer² to implement and monitor the COVID-19 SOPs. The EH&S officer cum COVID-19 Officer² 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>

Safe Operating Procedures (SOP) and COVID-19 Management Plan for Construction works

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

Safe Operating Procedures (SOP) and COVID-19 Management Plan for Construction works

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 distancing³ by maintaining a minimum distance of 6-feet from others³ 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.

Safe Operating Procedures (SOP) and COVID-19 Management Plan for Construction works

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

Safe Operating Procedures (SOP) and COVID-19 Management Plan for Construction works

- 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



Safe Operating Procedures (SOP) and COVID-19 Management Plan for Construction works

Re-usable PPEs⁴ 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 its 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

Safe Operating Procedures (SOP) and COVID-19 Management Plan for Construction works

- 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

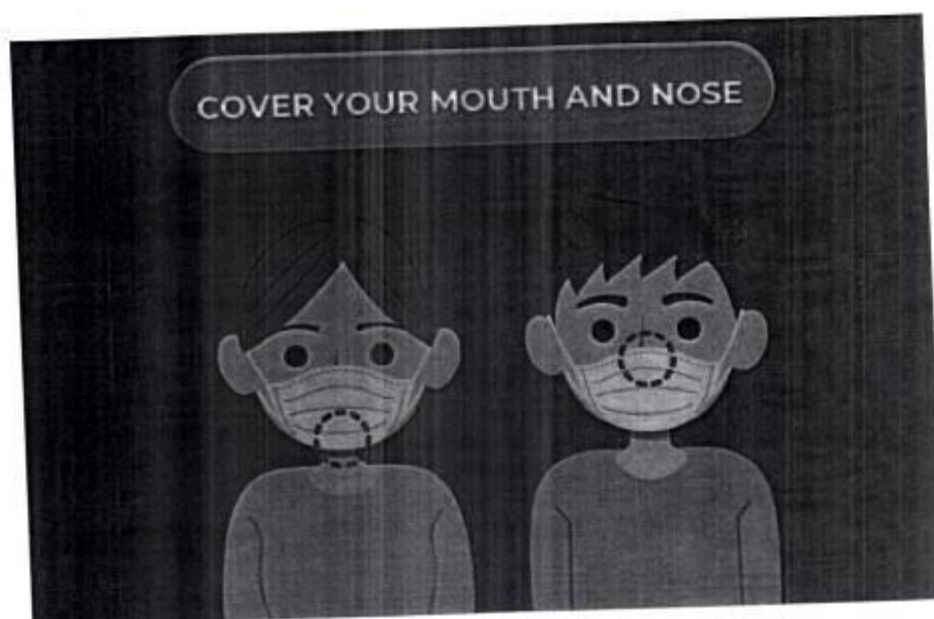
Ensure all staff and personal use the Aarogya Setu app, recommended by GOI for tracking COVID-19 patients.

Shakeen
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Page 9 of 9

COVID-19 PRECAUTIONS

(To be displayed at sites)









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