

Initial Environmental Examination

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

Sagwara Water Supply and Wastewater Works

CURRENCY EQUIVALENTS

(as of 16 February 2023)

Currency unit	–	Indian rupee (₹)
₹1.00	=	\$ 0.01
\$1.00	=	₹ 82.76

ABBREVIATIONS

ADB	–	Asian Development Bank
BOCW	–	Building and other Construction Workers
CLC	–	city level committee
CPCB	–	central pollution control board
CTE	–	consent to establish
CTO	–	consent to operate
CWR	–	clear water reservoir
DBO	–	design-build-operate
DPR	–	detailed project report
EHS	–	environmental health and safety
EIA	–	environmental impact assessment
EMP	–	environmental management plan
FSSM	–	Fecal Sludge and Septage Management
IEE	–	initial environmental examination
IFC	–	International Finance Corporation
LSGD	–	Local Self Government Department
MOEFCC	–	Ministry of Environment, Forest and Climate Change
OHSR	–	overhead service reservoir
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
SBR	–	sequential batch reactor
SEIAA	–	State Environmental Impact Assessment Authority
SPS	–	Safeguard Policy Statement, 2009
STP	–	sewage treatment plant
TEER	–	treated effluent elevated reservoir
TESR	–	treated effluent storage reservoir
ULB	–	urban local body
WHO	–	World Health Organization
WTP	–	Water Treatment Plant

WEIGHTS AND MEASURES

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

NOTE

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

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

EXECUTIVE SUMMARY

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

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

- **Water supply.** (i) New one Clear water reservoir (CWR) with Pump House (1200kl) (ii) New one Clear Water Pump House (CWPH) (iii) 7.448 km of transmission mains and feeder mains (iv) 116.89 km of water distribution networks (v) Refurbishment of 5 OHSRs, 1 CWR, 1 GLSR and 6 tube wells (vi) House Service Connections- 5504 nos. (vii) Construction of 2 CRMC, and 1 MCC.
- **Sewerage.** (i) New sewage treatment plant (STP) 3.6 MLD; Treated Effluent Elevated Reservoir (TEER), Treated Effluent Storage Reservoir (TESR); septage collection & conveyance (4000 liter mobile tankers), (ii) New Sewerage Pumping Station (SPS) 1.0 MLD (iii) 1.95 kms of DI K-9 Rising mains (iv) 39.64 kms of sewage collection networks (v) House Sewer Connections -4215 nos.

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

Description of the Environment. Subproject components are in Sagwara 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. The proposed STP, SPS and CWRs will be constructed on vacant government land. There are no trees on the site and is surrounded mostly by agricultural areas. The nearest built-up structures are Maruti service station & Central Jail/BSNL Exchange located about 150 to 250 m away from the proposed STP site. The selected STP site is in government owned site in low line area in downward side of natural slope of town making it most feasible site for STP. The selected site is also had sufficient area for future expansion of the STP, area available 6472 sqm against 3600 sqm required. The discharge point for treated effluent of STP is a natural depression located near STP site from here it shall be

reused by nearby farmers and overflow from this depression will reach to natural stream on down stream of town. The nearest wildlife sanctuary is Sita Mata Sanctuary located 65 km from project town. The nearest ASI protected monument in Dungarpur district are Deo Somnath temples about 35 km and Jain Temple Inscription in Baroda village about 25 km from Sagwara town

Potential Environmental Impacts and Mitigation measures. In this draft IEE, negative impacts were identified in relation to location, design, construction and operation of the improved infrastructure. Environmental impacts as being due to the project design or location were not significant as various measures are already included in site planning and preliminary design. No impacts on forests or archeological resources envisaged. Temporary measures suggested to avoid any disturbance / damage to buildings during laying of water lines in nearby roads. Source of water for town is Beneshwar Anicut, assessment confirm the source sustainability to provide additional water, and no water sharing conflicts or downstream impacts envisaged. Beneshwar Anicut, across River Mahi, perineal river of Rajasthan, live storage capacity of Beneshwar Anicut, 8.78 million cubic meter (MCM). Annual water demand of Sagwara for year 2055 is 2.91 MCM. New STP of 3.6 MLD will employ sequential batch reactor (SBR) technology to meet stipulated discharge standards. SBR will involve aerobic treatment, with minimum odour potential. Sludge management is included in the STP, properly dried sludge will be reused as manure.

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

Environmental Management. An environmental management plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels, along with the delegation of responsibility to appropriate agency. Various design related measures are already included in the project design. During construction, the EMP includes mitigation measures such as (i) proper planning and scheduling of water line and sewer works to minimize public inconvenience; (ii) measures to avoid impacts on heritage building and chance find procedures (iii) barricading, dust suppression and noise control measures; (iv) traffic management measures for works along the roads and for hauling activities; (v) occupational and community health and safety, labour welfare, (vi) provision of walkways and planks over trenches to ensure access will not be impeded; (vii) reuse of excavated materials to extent possible, (viii) spill and sediment control measures to avoid water and soil pollution, etc., EMP will guide the environmentally-sound construction of the subproject. EMP includes a monitoring program to measure the effectiveness of EMP implementation and include observations on- and off-site, document checks, and interviews with workers and beneficiaries. A copy of the updated EMP/ site environmental management plan (SEMP) shall be kept on-site during the construction period at all times. The EMP will be included in bids and contracts, and implementation shall be binding on contractors.

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 10 places along with proposed alignment with about 66 persons in month of December 2021 - April 2022. A City Level Committee (CLC) was held and CLC has appreciated and approved the subproject. The IEE will be made available at public locations; this draft IEE will be disclosed to a wider audience via the ADB and RUDSICO websites. Consultation process will continue during project implementation. A grievance redress mechanism (GRM) will be established to redress public grievances.

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

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

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

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

B. Purpose of Initial Environmental Examination Report

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

C. Scope of IEE

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

D. Report Structure

7. This Report contains the following sections:

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

II. DESCRIPTION OF SUBPROJECT

A. Subproject Location

8. **Sagwara Town:** Sagwara is a city and a municipality in Dungarpur district in the Indian state of Rajasthan. Sagwara is located at 23.68°N 74.02°E. Sagwara is famous for sculpture,

marble carving, temple architecture and gold jewellery. It is a major trading hub for nearby villages. Sagwara is the third largest populated place after Banswara and Dungarpur in the historical areas of Rajasthan. Majority of the population belongs to Hindu religion and it also has a significant population of Jains and Dawoodi Bohras (a Shia Islamic Muslim community).

B. Existing Water Supply and Sewerage Conditions

1. Water Supply

9. **Source of Water.** Presently major source of water at Sagwara town is surface water from Lodeshwar Dam. The town is also benefited from 6 no. of tube wells at various locations in the city. The water from Lodeshwar dam is being treated at 7.1 MLD WTP (for rural and urban scheme) situated at 700 m from dam. The WTP is connected to Clear Water Reservoirs (CWRs) at various locations in the city. From the CRWs, the water is pumped to related Overhead Service Reservoirs (OHSRs). At present total supply in the town is 4.60 MLD, which include 0.14 MLD from Tube Wells and 4.46 MLD from Lodeshwar dam.

10. Another existing surface water source is the Baneshwar Anicut on Mahi River, which is about 29 km from Sagwara town. Recently a new drinking Water Supply Project has been approved by PHED which will provide treated drinking water from Beneshwar Anicut to Sagwara town. Sagwara will get deficit water (excluding GW) from this project of PHED.

11. The Baneshwar Anicut situated on Mahi River about 3 km from tehsil headquarter Sabla. After construction of the PHED-initiated project, Lodeshwar dam and WTP at Lodeshwar dam will not be used for Sagwara subproject. Storage capacity of Beneshwar Anicut is 310 Mcft (about 8,778 million liters). The subproject is expected to abstract about 7.96 MLD, which is the design for ultimate year 2055. This rate of abstraction is considered insignificant. In terms of volume, the annual requirement for the subproject is only about one-third of the total storage capacity of Baneshwar Anicut. It is evident that the Anicut is full to its crest level at the end of monsoon season (September), which gradually reduced to its minimum in summer and up to the arrival of monsoon flows in June-July.

12. **Transmission Mains.** Water collected in CWRs is transferred to various OHSRs through DI transmission mains with varying sizes from 100mm to 350mm diameters. All DI transmission mains are functioning properly, and only minor rehabilitation works will be required. Further as per policy taken, no AC pipes will be used in water supply.

13. **Distribution Network.** Entire town is divided into 7 water supply distribution zones. Depending on locations, water flows either by gravity from the various OHSRs or by direct pumping with variable frequency drive (VFD) pumps. The existing water distribution network has a total length of about 72.63 km, consisting of asbestos cement (AC) pipes (56.083 Km), cast iron (CI) pipes (10.673 Kms), high density polyethylene (HDPE) pipes (3.584 Kms.) and ductile iron (DI) pipes (2.291 Kms) pipes. Most of these pipes were determined to be very old with heavy leakages due to pipe and joint breakages. Therefore, the need replace except for some alignments with newly laid HDPE and DI pipelines. In particular, it is recommended that the old AC and CI pipelines will be replaced with new HDPE pipes of sizes ranging from 75 mm to 315 mm diameters.

Table 1: Details of Existing Distribution System

S. No.	Diameter (mm)	Material	Length (m)
1	80	AC	33582
2	100	AC	7149
3	125	AC	435
4	150	AC	12581
5	200	AC	2336
			56083
6	80	CI	9347
7	100	CI	1074
8	150	CI	252
			10673
9	90	HDPE	1234
10	110	HDPE	2350
			3584
11	100	DI	190
12	150	DI	391
12	200	DI	1235
12	250	DI	136
12	300	DI	339
			2291
TOTAL			72631

14. Existing water supply in Sagwara town is intermittent. There are 2 nos. of CWRs, 7 No's of OHSR/GLSR located in Sagwara town. The capacities of the OHSRs and GLSRs range from 100 KL to 600 KL. Gross water supply rate is over 70 liters per capita per day (LPCD), and the water received at consumer end is about 60-70 LPCD only. This is much less than standard per capita consumption of 135 LPCD. This is due to heavy losses of about 20 – 40% in the existing distribution network. Presently, about 70-80% area of municipality limit is covered under the drinking water supply scheme by ULB. Remaining area which is newly developed and newly added to the municipality area is still unconnected with piped scheme and will be considered under the subproject. Details of existing CWRs and OHSRs in Sagwara town are given below:

Table 2: Details of Existing CWRs and OHSRs in Sagwara Town

S. No.	Type (CWR/OHSR)	Location	Capacity (KL)	Year of construction	Proposal under RUIDP Ph-IV (abandon/ demolish/refurbish /repair/no change)
1	CWR	Main Pump House Head Works	337	1975	Not Considered.
2	CWR	Main Pump House Head Works	202	1968	Not Considered.
3	CWR	Punarwas Colony Head Works	337	1975	Considered for Repair.
4	OHSR	Nasiya Ji	560	2006	Considered for Repair.
5	GLSR	Suwaron Ka Dungara	202	1968	Considered for Repair.
6	OHSR	Sindhi Colony	225	1989	Considered for Repair.
7	OHSR	Hospital Colony	100	1995	Considered for Repair.
8	OHSR	Gamathwara Tabiyad basti	400	2015	Considered for Repair.

S. No.	Type (CWR/OHSR)	Location	Capacity (KL)	Year of construction	Proposal under RUIDP Ph-IV (abandon/ demolish/refurbish /repair/no change)
9	GLSR	Indra Colony	400	2005	Considered for Repair.
10	OHSR	Galiyakot Road Punarwas Colony	225	1975	Not Considered.

2. Sewerage

15. At present, there is no sewerage system in place in Sagwara. Presently the wastewater from kitchens & bathrooms is discharged into storm water drains culminating finally to the Nallah or on ground, which pollutes the environment and contaminates the ground water. Open defecation is not uncommon. Therefore, untreated wastewater and septic tank effluent from uncovered areas are discharged into open drains sullage and accumulated in the low-lying areas in the outskirts of the town. Most of the residential and commercial buildings and educational institutions have on-site septic tanks and soak pits. Though septic tanks are an accepted onsite treatment, as the septic tanks are not designed and maintained properly, the effluent does not confirm to the standards. The effluent from the septic tanks is directly let into the open drains.

C. Proposed Water Supply and Sewerage in Sagwara under RSTDSP-AF

16. **Water Supply Works.** Presently about 70-80% area of municipality limit is covered under the drinking water supply scheme by ULB. Remaining area which is newly developed and newly added to the municipality area is still unconnected with piped scheme and will be considered under this proposal. Current water supply is not sufficient for future demand of water for Sagwara, therefore improvements in water supply of town is proposed in Sagwara under RSTDSP to meet the following objectives:

- (i) To establish continuous pressurized water supply system to consumers with quality and quantity at required pressure;
- (ii) To reduce NRW as per performance indicators using district metering areas (DMA) approach;
- (iii) To ensure 100 % house service connections with metering for water supply; and
- (iv) To ensure sustainability of the project by implementing a comprehensive asset management plan focusing on an integrated approach to operation & maintenance to minimize lifecycle costs.

17. **Total water supply required.** Total treated water demand and availability in Sagwara town is detailed below.

Table 3: Population Projections and water demand

Year	Population	Basic Demand (@135LPCD)	Total clear water demand (including 12 % losses (10% distribution and 2% transmission main))	Existing Production at Punarwas HW from Lodeshwar Dam in MLD	Required Clear Water (including bulk demand for hospital OHSR) in MLD	Available Water in MLD (Surface Water) from Beneshwar Anicut
		MLD				

					(Surface Water)	
2025	35326	4.77	5.41	4.46 (Not used in proposal as not being sustainable source)	5.51	10.14
2040	42969	5.80	6.58		6.68	
2055	51993	7.02	7.96		8.06	

18. **Proposed Source for Water Supply in Sagwara.** Water demand of Sagwara town for year 2040 and 2055 are 6.68 MLD and 8.06 MLD, respectively. Against the demands for years 2040 and 2055, only 4.46 MLD is available with existing source (i.e., Lodeshwar dam). Therefore, Lodeshwar Dam is not found to sustain future demand. As per PHED letter no. 998-1002 dated 23 November 2021, a new water supply project is sanctioned by the Government of Rajasthan (refer Appendix 8), wherein Baneshwar Anicut will be utilized as a new source of raw water. Subsequently, raw water will be treated and then supplied to a proposed CWR at Gas Godam under RSTDSP-AF.

19. Proposed works under the Water Supply component of the subproject are:

- (i) Construction of 1 no. clear water reservoir (CWR) at new source campus near Gas Godam;
- (ii) Construction of one Clear Water Pump House (CWPH) at new campus near Gas Godam HW and Punarwas Colony HW, Galiyakot;
- (iii) Laying of transmission mains and feeder mains with aggregate length of 7.448 km;
- (iv) Laying of water distribution network with total length of 117 km;
- (v) Refurbishment of 5 OHSRs 1 CWR, 1 GLSR and 6 tube wells;
- (vi) Installation of 5,504 nos. of House Service Connections; and
- (vii) Construction of two Consumer Relation Management Center (CRMC), and one Master Control Center (MCC).

20. **Associated projects** - A central government-sponsored project entitled "Water supply project for 212 villages (Sabla and Sagwara Block) of district Dungarpur from Baneshwar Anicut" under Jal Jivan Mission is proposed. Under this project, the Baneshwar anicut is considered as sustainable source of water, where an Intake, WTP of 34.7 MLD capacity, and 450 mm DI Rising Main Pipeline of about 29 km length will be constructed and will be executed by Public Heath and Works Department (PHED) Sagwara. Technical sanction has been issued by PHED and bid is to be invited. The Rising Main line is proposed from WTP to CWR along the Lodsa brige-Padardi-Badi-Varsinghpur – Sagwara road route, the treated water for Sagwara town will be made available at clear water reservoir (CWR) at new source campus near Gas Godam, under this project. The construction of rising main and WTP components will be completed by end of year 2024 and it will be available before completion of ground works under the subproject (Appendix 8).

21. **Sewerage Works.** The subproject will develop a sewerage system in Sagwara Town to collect, treat, and dispose/reuse the domestic wastewater safely. The objectives of the proposed sewerage works are:

- (i) Construction of sewerage network, including house sewer connection and collection of wastewaters from point of generation;

- (ii) Construction of energy efficient and mechanized STP and electromechanical machinery;
- (iii) Septage management and decentralized wastewater treatment systems in suitable areas;
- (iv) Provision for reuse of treated effluent etc.;
- (v) To ensure 100 % house service connections for wastewater collection; and
- (vi) To ensure sustainability of the project by implementing a comprehensive asset management plan focusing on an integrated approach to O&M to minimize lifecycle costs.

22. **Sewage Flows for Different Horizon Years.** As per CPHEEO Sewerage Manual, 80% of the water may be expected to reach the sewers unless there is data available to the contrary. In Sagwara, it is proposed to supply the water at the rate of 135 LPCD. The expected flow of sewage is assumed to be 108 LPCD, with 5% additional provision to account for ground water infiltration and any other unaccounted nondomestic flows. The design period for the subproject is 30 years with 2025 taken as the Base year; 2040 as the Intermediate year for the design of electro-mechanical equipment of pumping stations and for the design of STPs; and 2055 as the Ultimate year for design of sewerage system and civil structures of pumping stations.

23. Accordingly, planning for the STP shall be based on the temporal need and resources. A total of 5.90 MLD treatment capacity is planned in the long term, with a first module of 3.60 MLD capacity STP proposed under the subproject and second module of 2.30 MLD capacity to be dealt with in future planning. Required STP capacity for Sagwara is given below.

Table 4: Population projection and STP Capacity Required for Sagwara

Location	Population			Sewage Generation (MLD)			STP capacity required (MLD)		
	2025	2040	2055	2025	2040	2055	2025	2040	2055
Town	35326	42969	51993	4.01	4.87	5.90	4.00	4.85	6.00
Total	35326	42969	51993	4.01	4.87	5.90	4.00	4.85	6.00
Zone-1	21995	26701	31914	2.49	3.03	3.62			
Zone-2	8372	10080	12507	0.95	1.14	1.42			
Zone-3	4961	6188	7574	0.56	0.70	0.86			
Total for Zone-1 and Zone-3	26956	32889	39488	3.06	3.73	4.48			
FSM (Zone-1)	5884	6793	7894	0.67	0.77	0.90			
STP Required for Zone-1 and Zone-3	21072	26096	31594	2.39	2.96	3.58	2.40	3.00	3.60

24. Proposed works under Sewerage component of the subproject are:

- (i) Construction of STP of 3.6 MLD based on SBR Technology near BSNL Telephone Exchange Office/Central Jail with co-treatment of sludge;
- (ii) Construction of 1.0 MLD SPS in Punarvas Colony (Near Indian Oil Petrol Pump);
- (iii) Laying of rising mains with total length of 1.95 km;
- (iv) Laying of sewage collection network with total length of 39.64 km;
- (v) Installation of 4,215 House Sewer Service Connections; and

- (vi) FSSM works including procurement of desludging equipment with 4000-L tank capacity for collection of fecal sludge and septage from 19 wards.

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

26. **Sewage treatment Plant.** It is proposed to develop sequential batch reactor (SBR)- based sewage treatment facility that will treat the incoming sewage to stringent discharge standards specified in this IEE and included in the bid documents. SBR is a cyclic activated sludge treatment process and provides highest treatment efficiency possible in a single step biological process. One STP (SBR technology) of 3.6 MLD based on SBR Technology near BSNL Telephone Exchange Office with co-treatment of sludge is proposed as part of the project in Sagwara to meet the demand. Proposed treatment process is shown in table below.

Table 5: Treatment Process proposed in Sagwara under RSTDSP

Module	Description	Design Capacity Average Daily Flow (MLD)	Proposed Treatment Process with Co-Treatment of Fecal Sludge
A	Campus Layout and unit arrangements	5.90	Planning of the STP shall be for 5.90 MLD (Two module of 3.60 MLD – under project and 2.30 MLD-Future planning)
B	MPS and Pre-treatment units	5.90 (Civil Units) 3.60 (Electro-mechanical works)	MPS (Inlet Chamber, Coarse Screen Channel, Distribution Chamber, Sump etc. Inlet chamber with grit removal mechanism as per CPHEEO Manual. Primary Treatment: Fine Screening + Distribution Chamber + Grit Removal system + Parshall Flume
C	Sewage Treatment Plant (STP) (Including provision of Co-treatment of Fecal Sludge)	3.60	Secondary Treatment: SBR Sludge Handling: Sludge Thickening (gravity or an efficient proven mechanical process) + Dewatering (centrifuge, volute or an efficient proven dewatering process) Disinfection,
D	Reuse of Effluent	3.60	Reservoir (TEER), Treated effluent Pump House of required capacity, and treated sewage bypass to nearest disposal point when reuse system cannot be worked, as per direction of EIC.
E	Sludge Management and Disposal	3.60	Safe disposal of sludge
F	Effluent disposal pipe	5.90	Safe disposal of treated effluent
G	Bypass arrangement	5.90	To bypass in rainy season.

27. **Disposal of Treated Waste Water:** After Treatment of waste water at proposed STP located near BSNL Telephone Exchange Office (3.6 MLD), near Banori regular monitoring of

Treated waste water shall be done and after meeting all national waste water discharge standards, treated water shall be disposed by gravity in natural depression located near STP site from here it shall be reused by nearby farmers and over flow from this depression will reach to natural stream on down stream of town. The land of disposal point is owned by ULB. The unused water will meet a seasonal drain flowing downstream of town to meet Moran River which is ultimately meeting Mahi river.

28. **Sludge treatment and disposal.** A Sludge Sump shall be provided to collect thickened sludge from SBR basins. Supernatant from the sump will be returned to inlet/equalization tank for treatment. Sludge from sump will be pumped to sludge thickener, and the thickened sludge will be pumped to mechanical sludge dewatering system (such as centrifuge). Dewatered sludge cake will further air dried in a sludge storage shed for 15 days and disposed in an identified site.

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

- (i) Sewage pumping system to pump sewage to STP including maintenance of entire system and maintaining the infrastructure (power charges to be paid by the Employer);
- (ii) STP including maintenance of entire system and maintaining the infrastructure (power charges to be paid by the Employer);
- (iii) Managing the sewerage network for collection of sewage including maintenance of entire system from property chambers up to disposal outfall of Sewage to STP;
- (iv) Sampling treated effluent to ensure that it meets the guaranteed treatment parameters;
- (v) Provide house connections for collection of sewage from house properties on approval or sanction by Employer;
- (vi) Contractor will provide continuous on-the-job trainings that will start from the day the contractor gets mobilized, and other capacity building programs by the contractor as important regular activities for staff of the Employer, PHED and Municipal Council / Corporation Sagwara; and
- (vii) Maintaining environmental norms at entire system components.

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

31. Under the FSSM, fecal sludge / septage will be collected from the household level septic tanks using truck mounted mobile desludging equipment and transported to STP for treatment. STP will have necessary provisions to receive and treat the septage along with the wastewater received via sewer network. STP will be designed accordingly by the successful bidder during the detailed design phase to comply with the treated effluent discharge standards specified in the bidding documents.

32. **Area proposed under Fecal Sludge and Septage Management.** It is proposed to

provide FSSM system in areas where the population density is low (less than 100 persons per hectare) and will not generate sewage in adequate quantity to convey by sewer network. FSSM will provide low-cost sanitation in areas where sewer network is not an immediate requirement/not feasible at present, will make septage collection, treatment and effluent management environment- friendly. Sagwara town is having 45 municipal wards. Out of 45, 19 wards have taken in FSSM. Full / Partial area of these wards which have scattered habitation at present taken in FSSM. For safe disposal of wastewater generation from these pockets of wards FSSM has been proposed. Detail of ward area, Base year population and population proposed under FSM is as shown in following table:

Table 6: Wards and Population Covered under FSSM

Zone No.	Ward No.	Ward Area (Sqm)	FSM Area (Sqm)	% of Ward	Total Ward Population			FSM Population		
					2025	2040	2055	2025	2040	2055
Zone-1 (Considered in FSTP)	15	1148144.27	1148144.27	100	1087	1238	1459	1087	1238	1459
	29	1979927.52	989963.76	50	905	1034	1164	453	517	582
	30	696010.49	696010.49	100	837	956	1076	837	956	1076
	31	621974.43	621974.43	100	801	916	1030	801	916	1030
	32	716822.56	353396.76	49	845	1037	1306	417	511	644
	33	451739.85	408801.06	90	938	1116	1384	849	1010	1252
	34	407805.95	407805.95	100	672	768	864	672	768	864
	35	2779905.46	2779905.46	100	768	877	987	768	877	987
					6853	7942	9270	5884	6793	7894
Zone-2 (Considered in FSTP)	1	1098091.48	549045.74	50	806	880	1136	403	440	568
	2	174351.62	174351.62	100	1197	1474	1796	1197	1474	1796
	3	358488.26	179244.13	50	967	1190	1451	484	595	726
	8	1856278.18	1763464.27	95	819	1014	1248	778	963	1186
	9	183336.16	183336.16	100	1036	1154	1569	1036	1154	1569
	10	417782.68	250669.61	60	1019	1213	1552	611	728	931
	25	73479.74	73479.74	100	775	977	1195	775	977	1195
	26	121274.64	121274.64	100	895	1129	1379	895	1129	1379
	27	460335.49	414301.94	90	1016	1271	1525	914	1144	1373
	28	65871.97	59284.77	100	826	959	1202	826	959	1202
	29	1979927.52	1979927.52	50	905	1034	1164	453	517	582
					10261	12295	15217	8372	10080	12507

33. Under the FSSM, fecal sludge / septage will be collected from the household level septic tanks using truck mounted mobile desludging equipment and transported to STP for treatment. STP will have necessary provisions to receive and treat the septage along with the wastewater received via sewer network. STP will be designed accordingly by the successful bidder during the detailed design phase to comply with the treated effluent discharge standards specified in the bidding documents.

34. **Table 7** shows the nature and size of the various civil works components of this Water Supply and Sewerage works subproject in Sagwara. Google Coordinates of proposed work sites are given in **Table- 8**. Locations of project sites in google map and conceptual layout plans and alignments are shown in **Figures 1 to 15**.

Table 7: Proposed Scope of Works in Sagwara Town

Component	Function	Description	Location and ownership
Water Supply Components			
CWR and pump house	To store clear water and pump to	New CWR of 1200 KL and pump house	In New campus near Gas Godam Ownership- PHED
Construction of two new water distribution pumping station with variable frequency drive pumps.	To provide adequate pressure in water supply system to distribute to consumers directly/transmit water to overhead tanks for gravity supply	New campus near Gas Godam HW Galiya Kot Road Campus	- New campus near Gas Godam HW - Galiya Kot Road Campus Ownership- PHED
Transmission mains and Feeder Mains	Water transmission from CRW for service reservoirs	Length- 7.448 km (Dia ranging from 100 mm to 350 mm)	Within ROW of existing roads
Distribution Network	Collect water from service reservoir and distribution to households	Length: 117.0 Kms (Dia ranging from 75 mm to 400 mm)	Within ROW of existing roads

Component	Function	Description	Location and ownership
Refurbishment of existing OHSRs, CWRs/GLSRs/Tube wells and Pump houses	Storage and pumping of clear water for supply Storage and supply of clear water through gravity. Abstract groundwater	1 NasiyaJi OHSR-560 kl 2 Suwaron Ka Dungara (Main PHED Campus) GLSR-202 kl 3 Sindhi Colony OHSR-225 kl 4 Hospital Colony (Only for Hospital) OHSR-100 kl 5 Gamathwara Tabiyad basti OHSR-400 kl 6 Indra Colony OHSR-400 kl Existing RCC CWR (337KL) Existing Tube wells (6 nos.)	OHSRs 1 NasiyaJi OHSR 2 Sindhi Colony 3 Hospital Colony 4 Gamathwara Tabiyad basti 5 Indra Colony OHSR-400 kl GLSR 1 Suwaron Ka Dungara (Main PHED Campus) CWR Existing RCC CWR at Galiyakot Road Punarwas Colony Head Works Tube wells Existing Tube wells (6 nos.) at different locations Ownership- PHED
House Service Connections	To get water supply from network to household	5504 Nos. house water connections	Houses
Two consumer relation management centre (CRMC), and one master control centre (MCC)	Consumer relations and master system control for entire water supply system	New Consumer Relation Management Centres (CRMC) – 2 no. Master Control Centre- 1 no.	Rajasthan Govt. Land- Land yet to be finalized.
Sewerage System			
Sewage Treatment plants (1 nos)	Treatment of collected wastewater to meet stipulated discharge standards	New - STP of 3.6 MLD	Near BSNL Exchange Office/Central Jail Ownership- Municipal Council
Sewage Pumping Station (SPS)	Sewer pumping stations are used to move wastewater to higher elevations in order to allow transport by gravity flow until the sewage reaches treatment plant.	New SPS 1 MLD	Near Punarvas Colony (Near Petrol Pump Indian Ownership- Municipal Council

Component	Function	Description	Location and ownership
Rising Main	To convey sewage from a pumping station to a gravity manhole (gravity sewer) or a sewage treatment plant	1.95 KM of dia 150 mm of DI K-9	Within ROW of existing roads
Sewer Collection networks	Collect wastewater from houses and convey by a combination of gravity and pressure pumping to pumping station and ultimately to the STPs	39.64 kms of sewage collection networks including 2.4 km trenchless works with dia 200 mm to 500 mm	Sewers will be laid underground in the roads and internal streets in the town. Sewers will be located in the centre of the road. The existing/proposed water pipes are/will be located on one or either side of the roads, and therefore sewers will be laid in the centre without distributing the water pipes. It is proposed that 2.4 km length of sewers will be laid by trenchless method; these will include highway /main road crossings, and the sewers to be laid deeper than 3.5 m
FSSM			
Truck mounted mobile desludging equipment	Desludging of septage from household pits/septic tanks, transportation & discharge to STP	Procurement of desludging equipment with 4000 lit tank capacity for collection of fecal sludge and septage from 19 wards have taken in FSM	Mobile equipment

Table 8: Coordinates of Sub Project Locations

COMPONENTS	Latitude	Longitude
Proposed CWR with pump house at new Campus near Gas Godam	23°41'2"N	74°1'32"E
Proposed CWPS near Puranawas Colony, Galiyakot	23°39'22.1"N	74°00'27.3"E
Proposed STP (3.6 MLD) near BSNL Exchange Office/Central Jail	23°39'52.63"N	74° 1'49.00"E
Proposed SPS (1 MLD) in Punarwas colony (Near Indian Oil Petrol Pump)	23°39'35"N	74°0'38"E
Disposal Point of STP in natural depression near Banori	23°39'51.99 "N	74° 01'50.66"E

Figure 1: Proposed STP and SPS Location

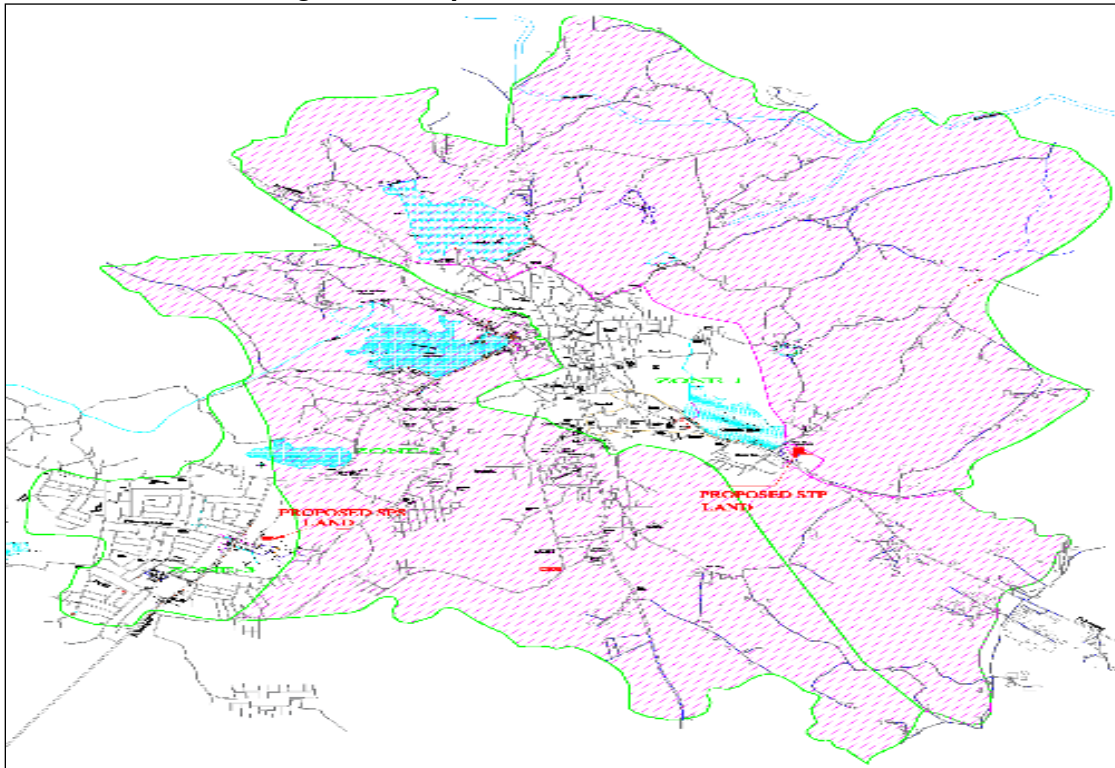


Figure 2: Location of Proposed STP on Google Earth Map

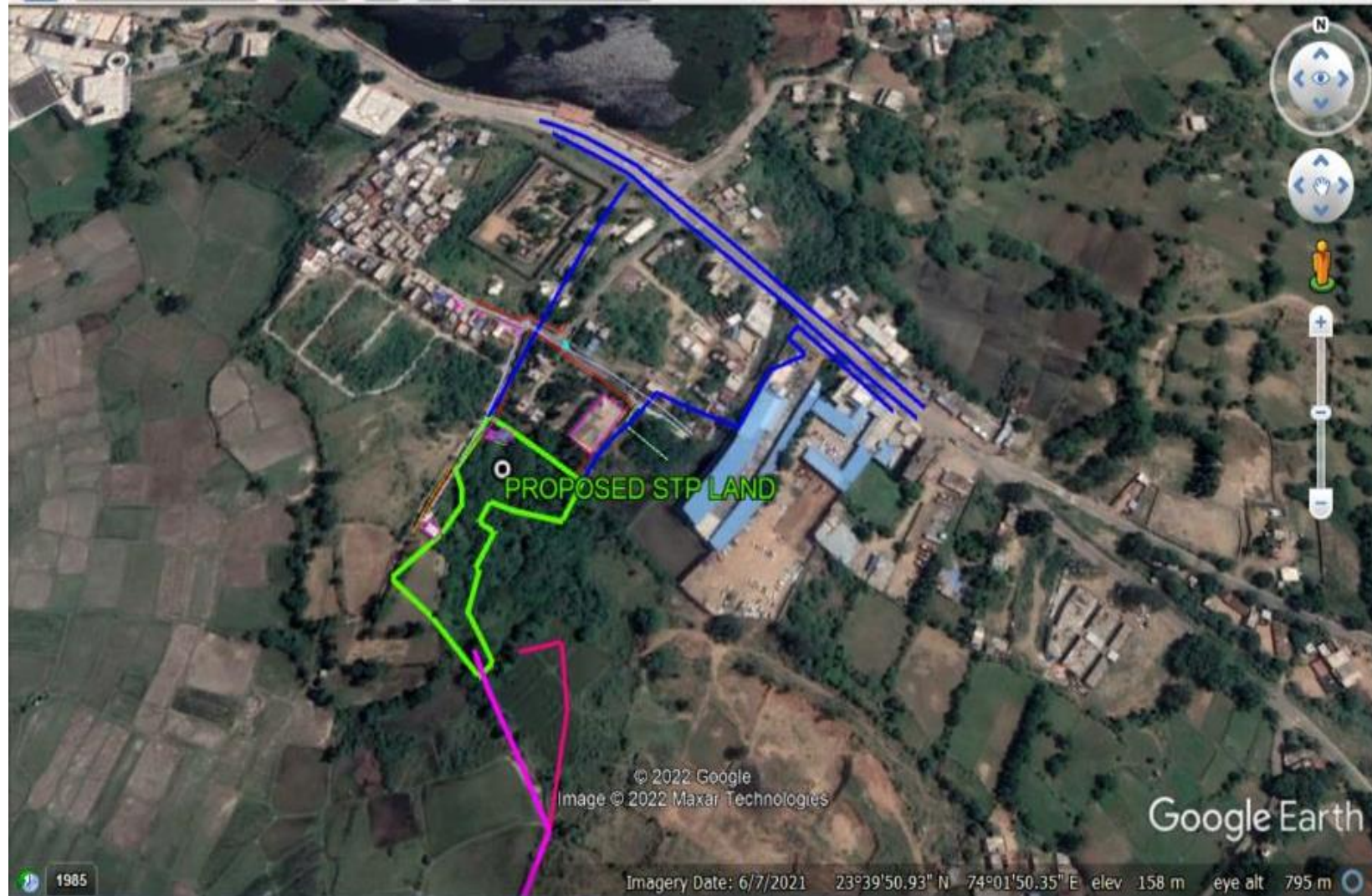


Figure 3: Location of Proposed SPS in Google Earth



Figure 4: Location of STP and Treated Effluent Discharge point



Figure 5: Location of CWR- near Gas Godam marked on Google Map

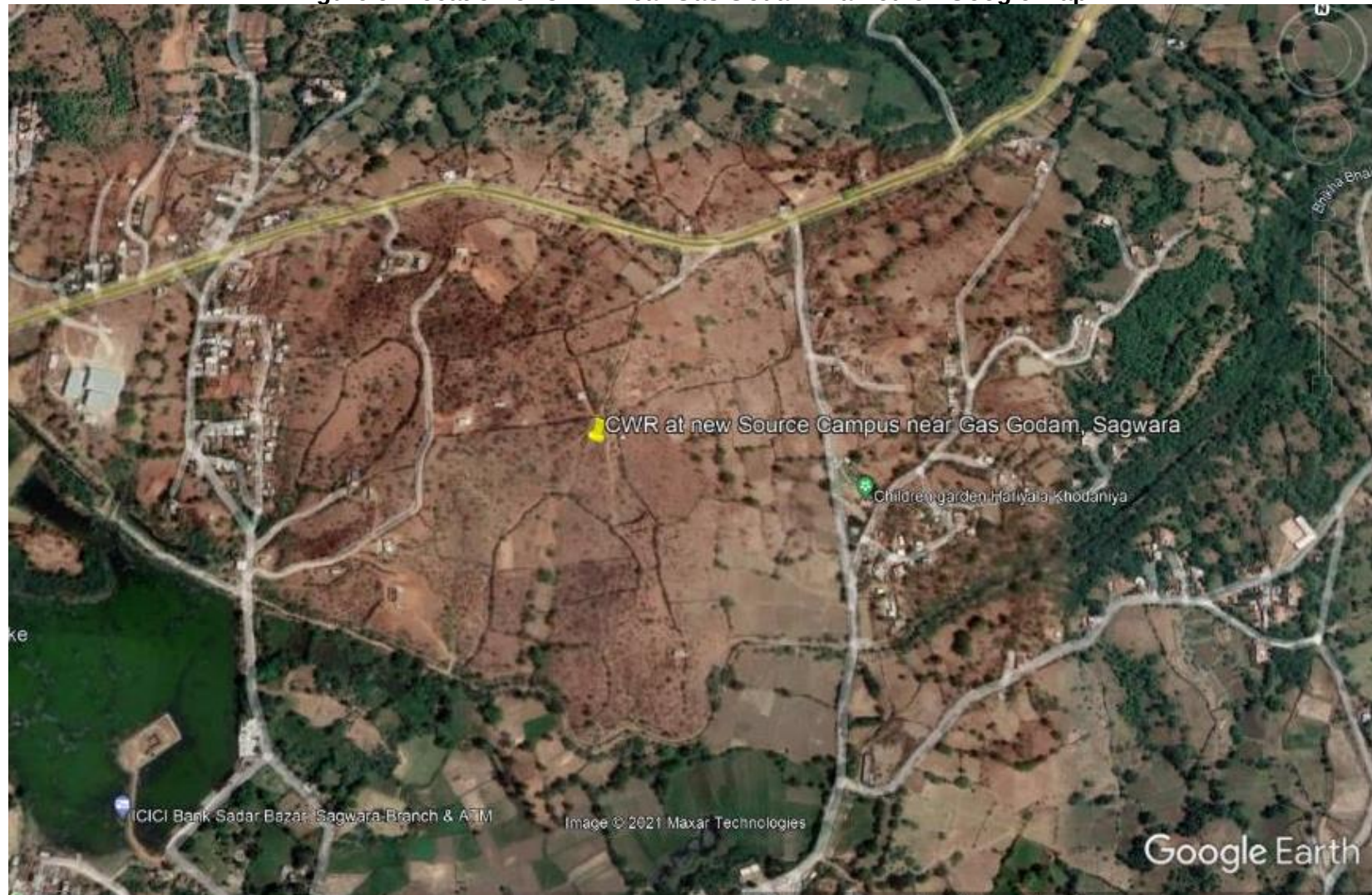


Figure 6: Location of CWPS- near Puranawas Colony marked on Google Map

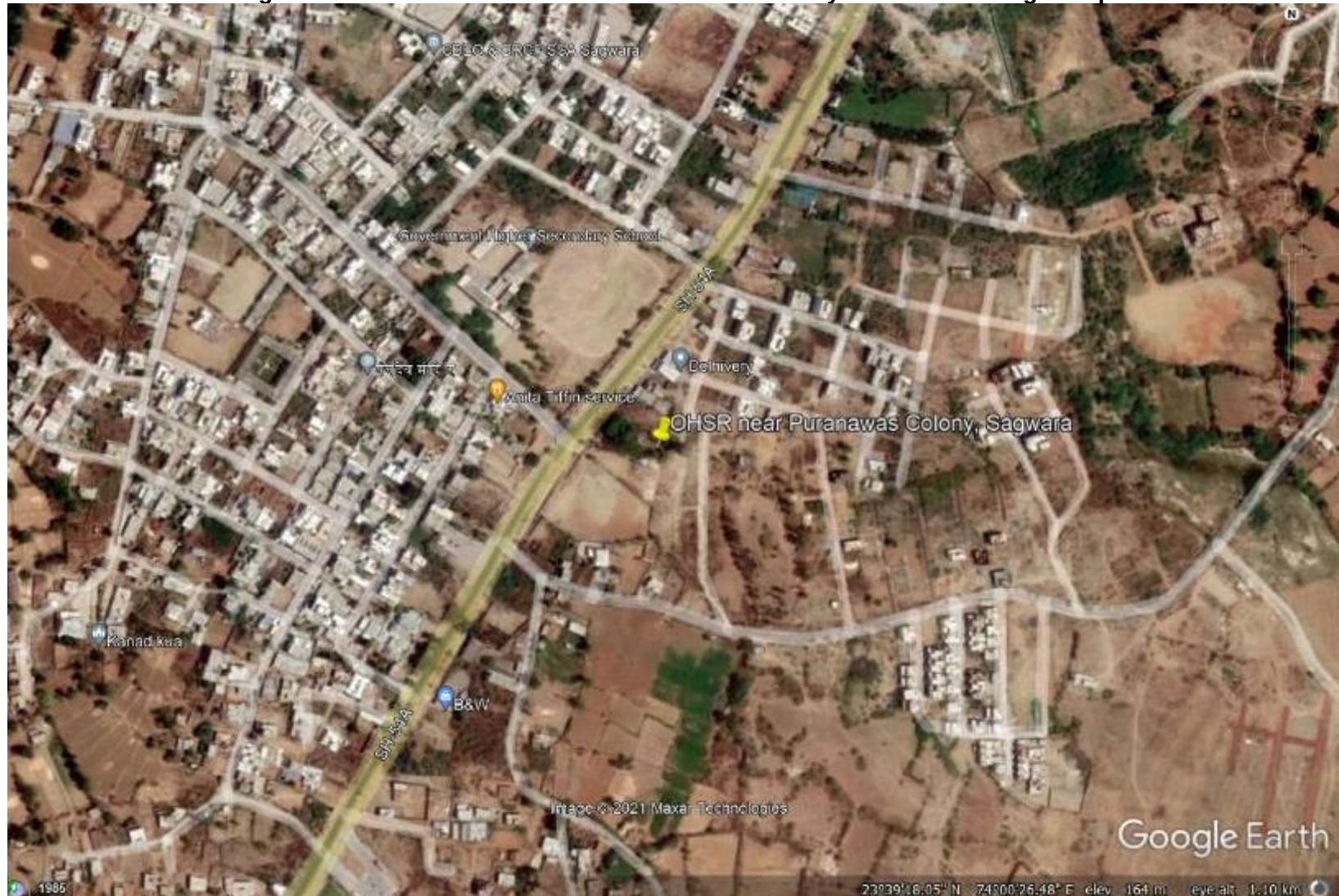


Figure 7: Location of SPS on Google earth Map



Figure 8: Distance showing of Forest blocks from Proposed STP (3.6 MLD) Location

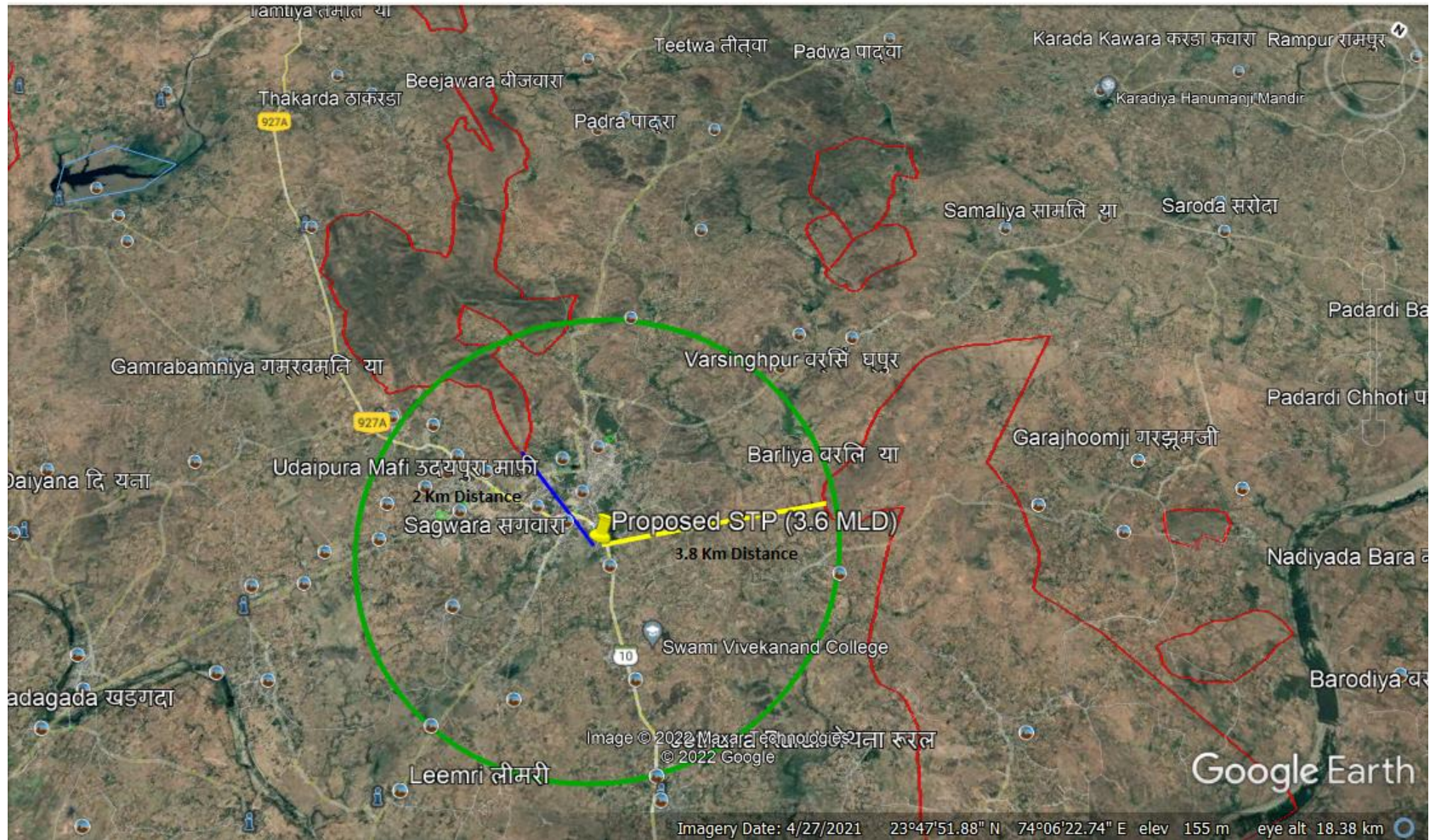


Figure 9: Layout of Proposed Water Supply network

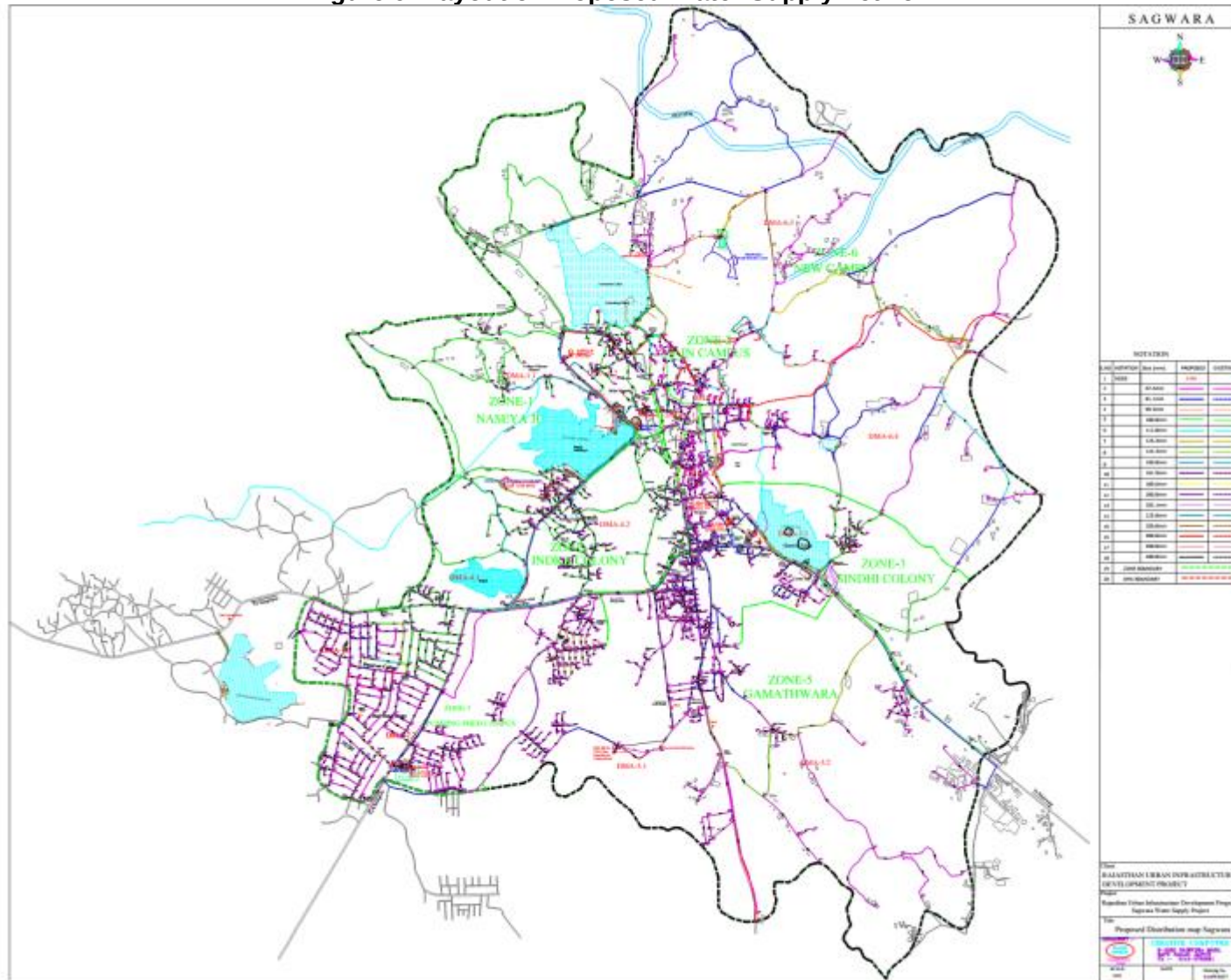


Figure 10: Location of Proposed Water Supply Works on SOI Toposheet

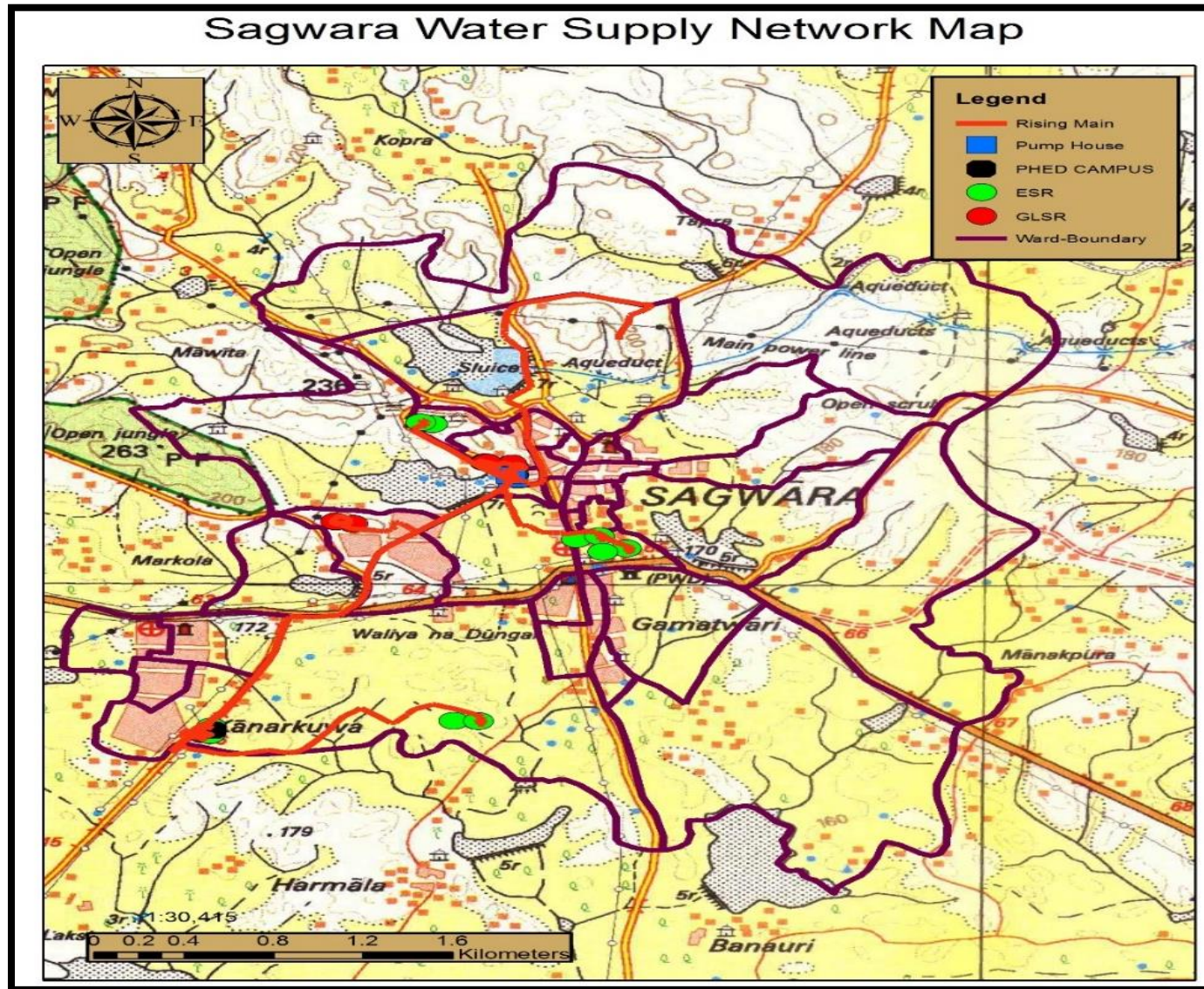


Figure 11: Schematic Layout of Proposed Water Supply Scheme in Sagwara

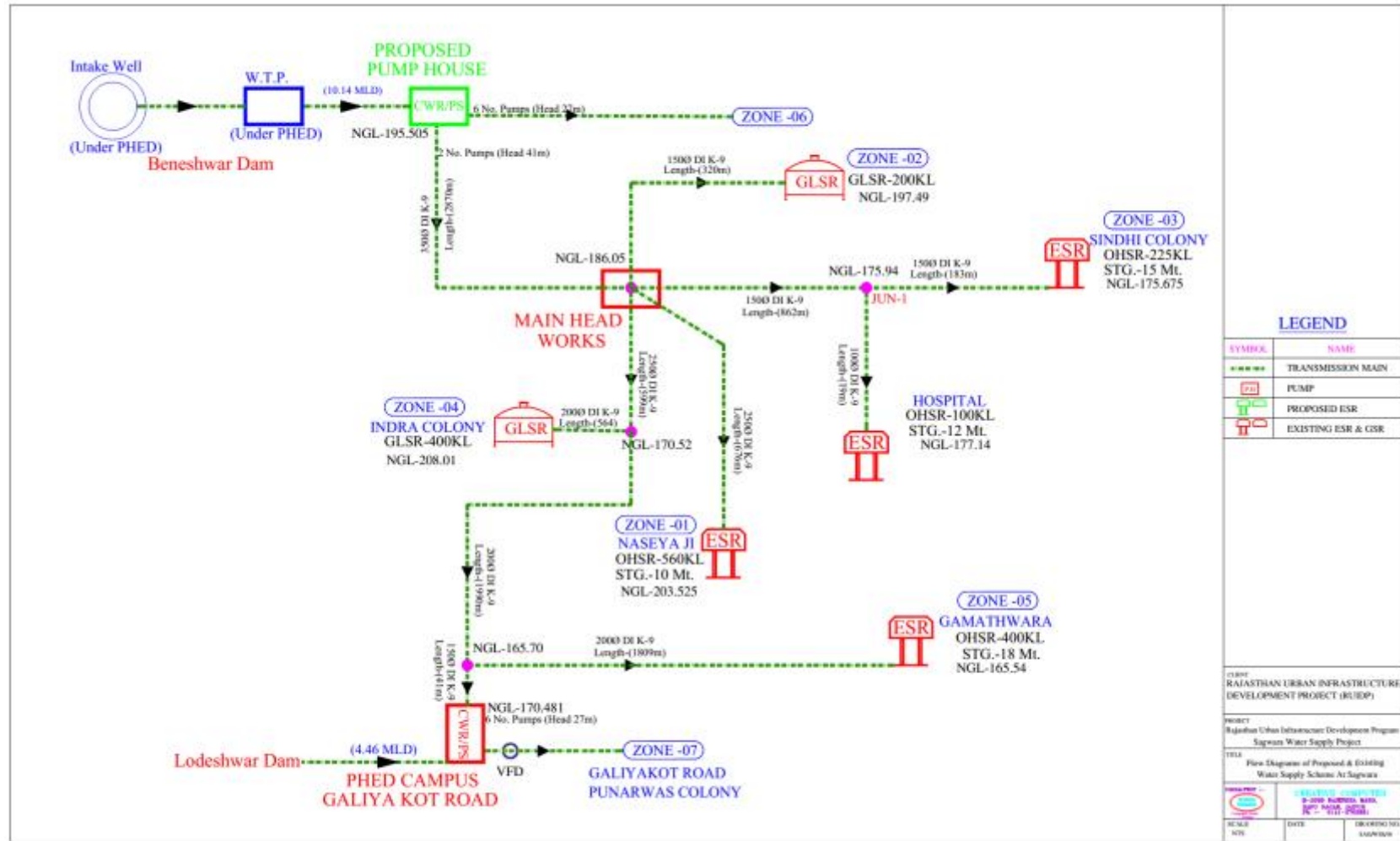


Figure 12: Layout of Proposed Sewerage Networks

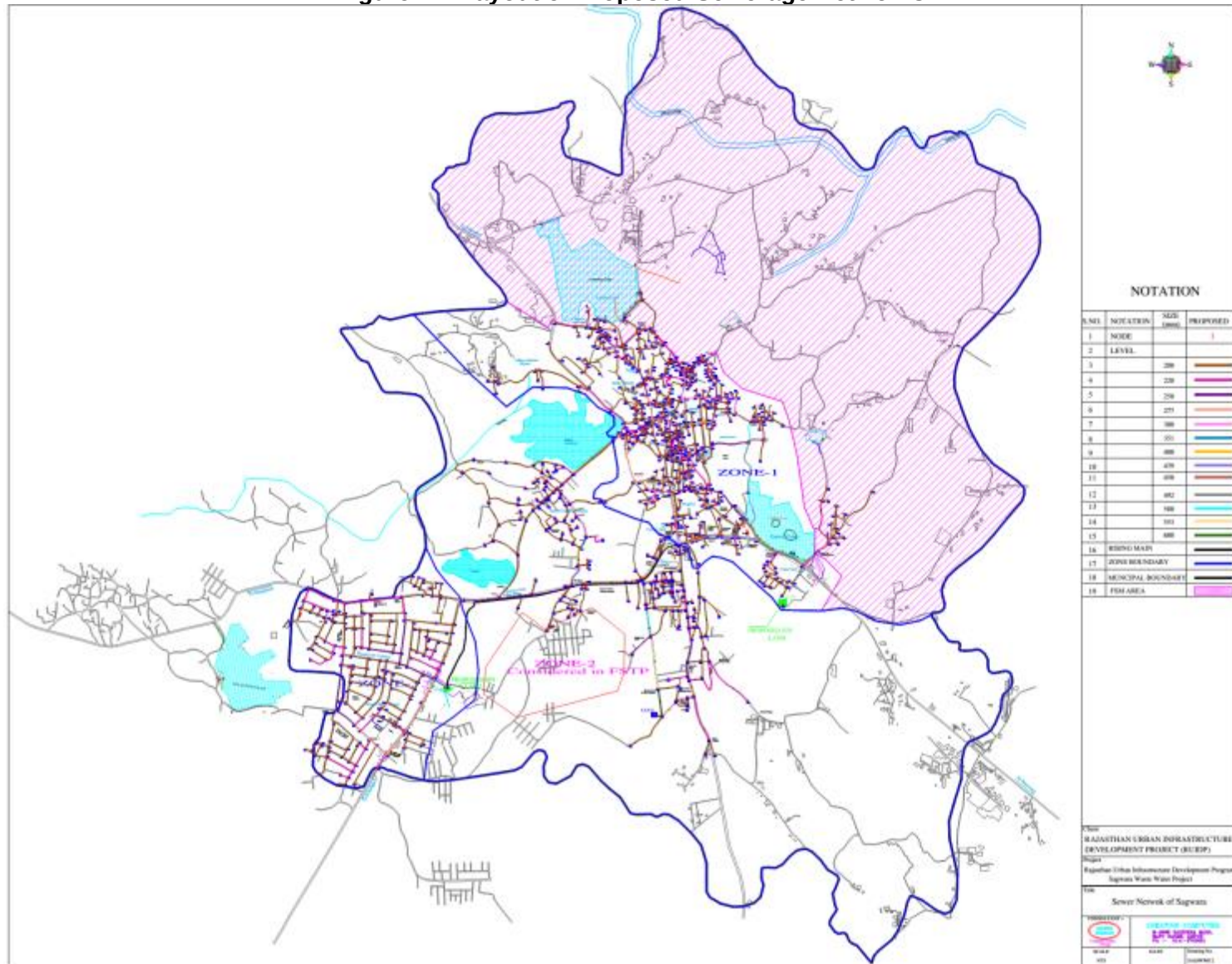


Figure 13: Location of Proposed Sewerage Networks Supply Works on SOI Toposheet

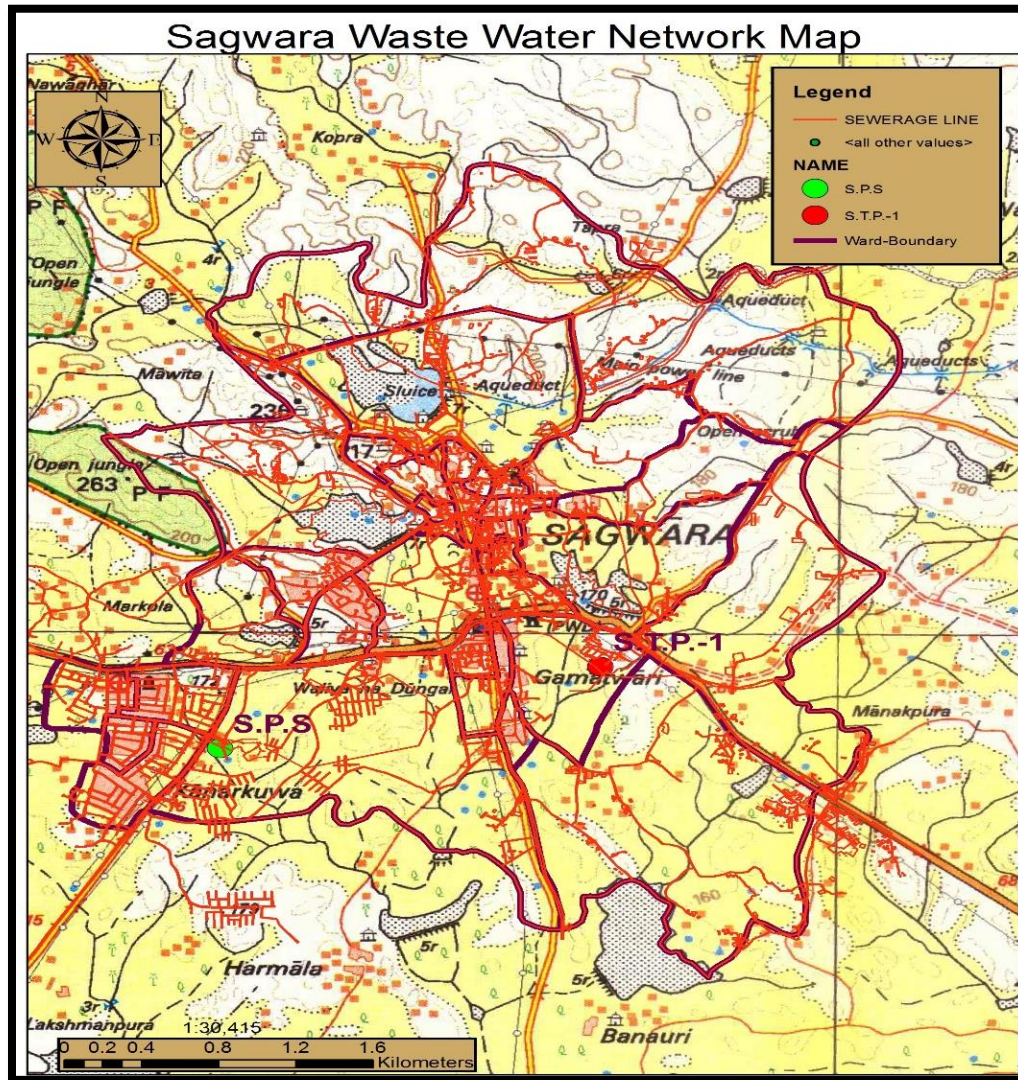


Figure 14: Proposed Sewerage Zone and FSSM Areas in Sagwara

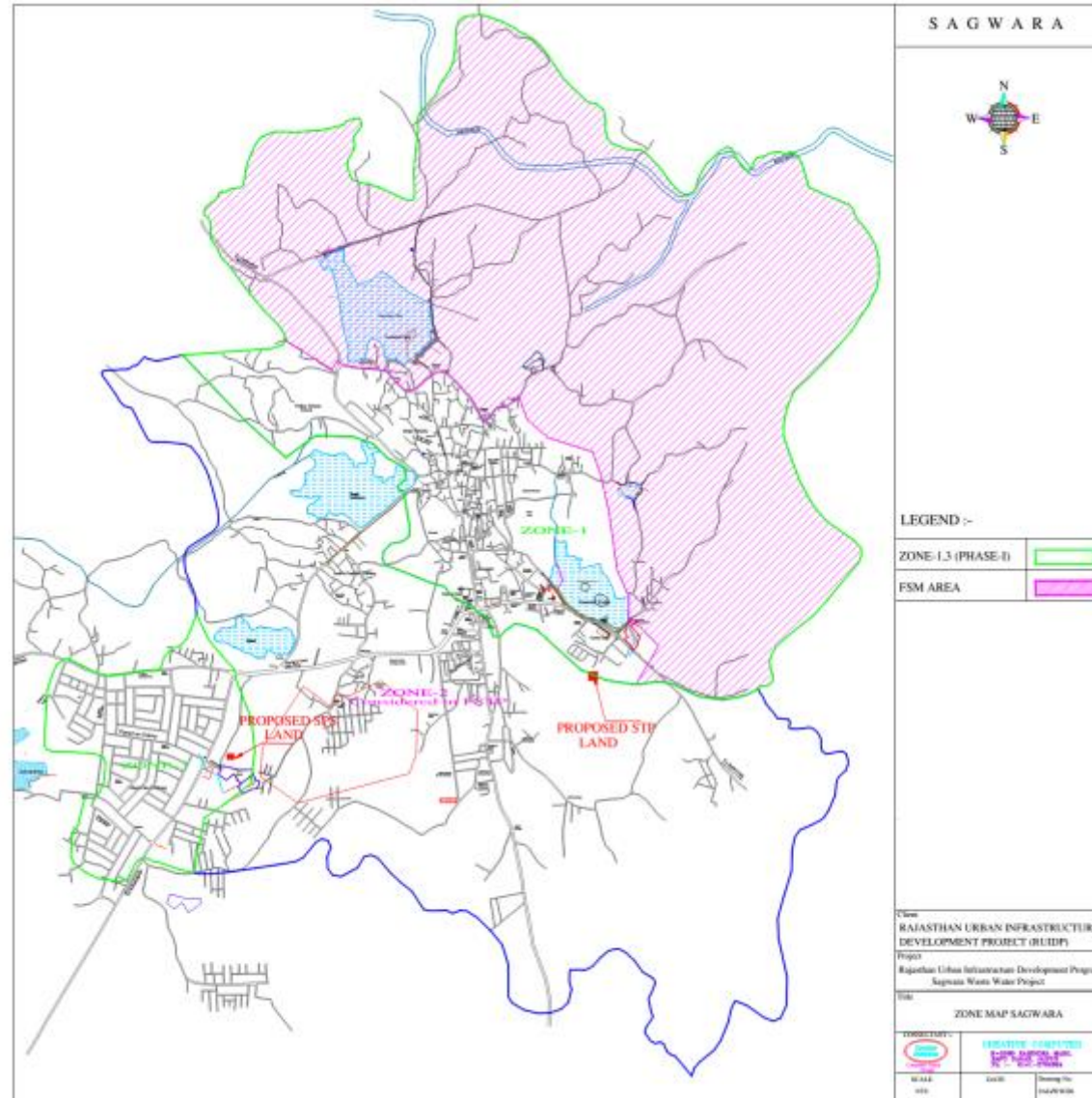
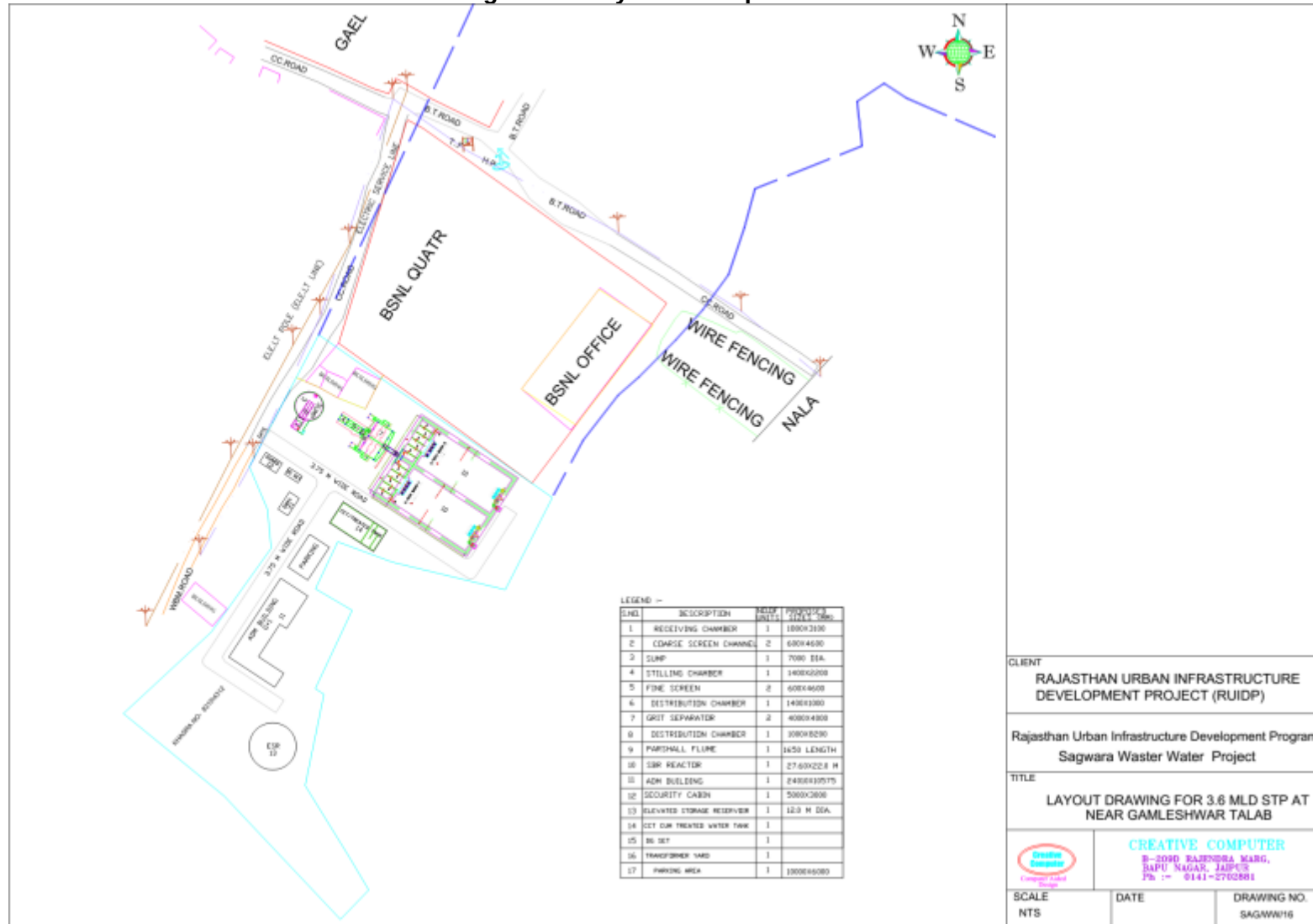


Figure 16: Layout of Proposed STP



D. Subproject Benefits

35. The subproject is primarily designed to improve environmental quality and living conditions of Sagwara Town through provision of water supply and sewerage works. The benefits arising from this subproject include: (i) increased availability of potable water at appropriate pressure to all households including urban poor; (ii) reduced time and costs in accessing alternative sources of water. (iii) better public health particularly reduction in waterborne and infectious diseases; (iv) reduced risk of groundwater contamination; (v) reduced risk of contamination of treated water supplies; and, (vi) improvement in quality of water bodies due to disposal of treated effluent meeting disposal standards.

E. Implementation Schedule

36. Subproject is proposed for implementation under DBO modality, wherein the successful bidder will design the water supply and sewerage systems and its components (based on the feasibility/preliminary design/standards/guidelines provided in the bid document), construct, commission, and operate for 10 years. After which, the operation and maintenance of the entire system will be transferred to Sagwara Municipality. Therefore, at this stage, the subproject design is preliminary and conceptual. Therefore, this IEE is based on this preliminary design and shall be updated during the final detailed design phase.

37. After the completion of preliminary designs, bids may be invited and contract was awarded to successful bidder up in the month of December 2022. Project duration of Design Build is 36 months. After completion of construction and commissioning, scheme will be operated by DBO contractor for 10 years, and after which the O&M will be carried out by ULB.

III. ANALYSIS OF ALTERNATIVES

38. The ADB SPS requires an analysis of project alternatives to determine the best method of achieving project objectives (which is providing potable water to people, and safely collecting and disposing the human waste generated, in Sagwara 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.

39. The proposed water supply subproject component in Sagwara include treated water conveyance, storage and distribution. Similarly, the sewerage component includes sewage collection network, transmission, treatment and treated wastewater reuse and disposal. Descriptions of various alternatives considered for critical components such as water source, sewage treatment, treated wastewater disposal etc., are presented in the following **Table 9**.

Table 9: Analysis of Alternatives

1.	Project Need – No Project Alternative
Type of alternative	'No project' alternative
Description of alternatives	Sagwara subproject is proposed to improve the service levels of basic infrastructure – water supply and sewerage Works

	Presently source of Water at Sagwara town is surface water from Lodeshwar Dam. The town is benefited from 6 no. of tube wells at various locations in the city. Water from these tube wells are directly fed in to distribution system. Total water abstracted from Tube Wells is 0.14 MLD and from Lodeshwar dam is 4.46 MLD. Existing Water supply in Sagwara town is intermittent. There are 7 No's of OHSR and GLSR located in Sagwara town. The capacity of the OHSRs and GLSRs is 100 KL to 560 KL. Gross water supply rate is over 70 litres per capita per day (LPCD), the water received at consumer end is about 60-70 LPCD only, which is less than standard of 135 LPCD. This is due to heavy losses in the existing distribution network about 20-40%. Presently, about 70-80% area of municipality limit is covered under the drinking water supply scheme by ULB. Remaining area which is newly developed and newly added to the municipality area is still unconnected with piped scheme and will be considered under this proposal. At present, there is no existing Sewage Treatment plant; therefore due to absence of any efficient disposal / treatment plant in town the waste water of town is accumulated at low lying area thus causes unhealthy conditions. Living conditions due to lack of proper water supply and sewerage, are poor, unhealthy, unhygienic. Lack of efficient sewerage treatment and disposal system infrastructure in town is also causing environmental pollution, overall poor quality of life. Poor environmental quality affects the urban poor more. The project intends to provide following benefits to the town population, and the "no project" alternative will deprive people of these benefits: (i) increased availability of potable water at appropriate pressure to all households including urban poor; (ii) reduced time and costs in accessing alternative sources of water. (iii) better public health particularly reduction in waterborne and infectious diseases; (iv) reduced risk of groundwater contamination; (v) reduced risk of contamination of treated water supplies; and, (vi) improvement in quality of water bodies due to disposal of treated effluent meeting disposal standards
Selected Alternative	Without subproject would yield the town to be continuously under-serviced that puts the health of the general public at an increasing risk and could potentially worsen the living environment. This 'no project' scenario would impede further social and economic development of the town and the defer commitments to improve the proportion of the population with sustainable access to clean water and basic sanitation. Given the large-scale benefits to the population and environment, 'no project' alternative is considered inappropriate.
2	Alternative source of water
Type of alternative	'Water source'
Description of alternatives	Presently source of Water at Sagwara town is surface water from Lodeshwar Dam. The town is benefited from 6 no. of tube wells at various locations in the city. These tube wells are directly feeded in distribution system. Total water abstracted from Tube Wells is 0.14 MLD and from Lodeshwar dam is 4.46 MLD. Water demand of Sagwara town for year 2040 and 2055 are 6.58 MLD & 7.96 MLD respectively. Against demand of year 2040 & 2055 only 4.46 MLD is available with existing source. Therefore Lodeshwar Dam is not found sustainable for future demand, As per PHED letter no. 998-1002 dtd. 23.11.2021 a new water supply project is sanctioned by Govt. of Rajasthan, in which raw water source from Beneshwar Anicut is taken as new source of water and treated water shall be supplied up to CWR proposed at Gas Godam under RSTDSP.
Selected	Selected source:

Alternative	Surface Water from Beneshwar Anicut (proposed under Jal Jivan Mission sanctioned by Govt. of Rajasthan and to be implemented by PHED). The Length of Baneshwar Anicut is 387 meter and height is 7.25 meter and its construction has been done as Anicut with broad crested weir. There are 79 numbers of openings at different elevation to regulate discharged of Mahi river. Gates are lowered and raised manually for regulation of river discharged. The gates are fixed and removed manually after monsoon and before monsoon respectively to maintained required water level in the Anicut. Storage capacity of Anicut is 8.78 MCM or 320 Mcft.																																																										
3	Sewage treatment process																																																										
Type of alternative	Sewage treatment technology																																																										
Description of alternatives	Various secondary treatment technologies have been considered in the sewage treatment process after the primary treatment consisting of screening and grit removal. Secondary treatment is the critical process that removes the organic putrescible organic matters and brings down the BOD of the effluent to meet the discharge standards. Following process technologies considered: Waste Stabilization Ponds; Aerated Lagoons; Up Flow Anaerobic Sludge Blanket (UASB) + FAL; Conventional Activated Sludge Process (ASP); and Cyclic Activated Sludge Process/Sequential Batch Reactor (SBR) A comparison of various treatment technologies is presented below in terms pf merits of the process over key parameters like quality characteristics and land requirement: <table border="1"> <thead> <tr> <th>Item</th><th>Conventional Activated Sludge</th><th>Extended Aeration</th><th>UASB followed by Facultative Aerobic Lagoon</th><th>Cyclic Activated Sludge Process / SBR</th></tr> </thead> <tbody> <tr> <td>Performance (Typical)</td><td>Mostly stable</td><td>Mostly stable</td><td>Varying with temperature variations</td><td>Complete Stable</td></tr> <tr> <td>BOD</td><td><30 ppm</td><td><30 ppm</td><td><30 ppm</td><td><10 ppm</td></tr> <tr> <td>COD</td><td><250 ppm</td><td><250 ppm</td><td><250 ppm</td><td><50 ppm</td></tr> <tr> <td>Suspended solids</td><td><50 ppm</td><td><50 ppm</td><td><100 ppm</td><td><10 ppm</td></tr> <tr> <td>Total Nitrogen</td><td>No Treatment</td><td>No Treatment</td><td>No Treatment</td><td><10 ppm</td></tr> <tr> <td>Total Phosphorous</td><td>No Treatment</td><td>No Treatment</td><td>No Treatment</td><td><2 ppm</td></tr> <tr> <td>Coliform removal, %</td><td>60-90</td><td>60-90</td><td>-</td><td>99.99%</td></tr> <tr> <td>Re-use Options</td><td>can only be used for low end usages like flushing and gardening tertiary treatment required for high and usages like construction water, industrial usages, cooling water etc.</td><td>can only be used for low end usages like flushing and gardening tertiary treatment required for high and usages like construction water, industrial usages, cooling water etc.</td><td>can only be used for low end usages like flushing and gardening tertiary treatment required for high and usages like construction water, industrial usages, cooling water etc.</td><td>Can be used for low end usages as well as for high end usages without any tertiary treatment.</td></tr> <tr> <td>Land requirement (m²/person)</td><td>0.1-0.18</td><td>0.08-0.15</td><td>0.2-0.25</td><td>0.035-0.07</td></tr> <tr> <td>Process Power requirement (kWh/person/year)</td><td>12-15</td><td>16-19</td><td>4-5</td><td>6-8</td></tr> </tbody> </table>				Item	Conventional Activated Sludge	Extended Aeration	UASB followed by Facultative Aerobic Lagoon	Cyclic Activated Sludge Process / SBR	Performance (Typical)	Mostly stable	Mostly stable	Varying with temperature variations	Complete Stable	BOD	<30 ppm	<30 ppm	<30 ppm	<10 ppm	COD	<250 ppm	<250 ppm	<250 ppm	<50 ppm	Suspended solids	<50 ppm	<50 ppm	<100 ppm	<10 ppm	Total Nitrogen	No Treatment	No Treatment	No Treatment	<10 ppm	Total Phosphorous	No Treatment	No Treatment	No Treatment	<2 ppm	Coliform removal, %	60-90	60-90	-	99.99%	Re-use Options	can only be used for low end usages like flushing and gardening tertiary treatment required for high and usages like construction water, industrial usages, cooling water etc.	can only be used for low end usages like flushing and gardening tertiary treatment required for high and usages like construction water, industrial usages, cooling water etc.	can only be used for low end usages like flushing and gardening tertiary treatment required for high and usages like construction water, industrial usages, cooling water etc.	Can be used for low end usages as well as for high end usages without any tertiary treatment.	Land requirement (m ² /person)	0.1-0.18	0.08-0.15	0.2-0.25	0.035-0.07	Process Power requirement (kWh/person/year)	12-15	16-19	4-5	6-8
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	Sludge handling	Sludge needs digestion prior to drying on beds or use mech. devices	Digested sludge, dry on beds or use mech. devices	Digested sludge, dry on beds or use mech. Devices	Digested sludge, dry on beds or use mech. devices														
	Equipment requirement (excluding screening and grit removal)	Aerators, recycle pumps, scrapers, thickeners, digester, dryers, gas equipment	Aerators, recycle pumps, sludge scrapers, (for large settlers)	Nil (gas collection optional)	Diffuse aeration system, recycle sludge and waste sludge pumps, decanters														
	Operational characteristics	Skilled Operation required	Simpler than activated sludge	Simpler than activated sludge	Complete automatic operation by computer and PLC. Negligible manpower Intervention required														
	Special features	Considerable equipment and skilled operation required especially if gas collection and usage involved. Method considered mainly for large sized plants	BOD removal high, effluent nitrified relatively high power requirement, favoured for small and medium sized plants	Minimal to negligible power requirement of the system makes it an economical alternative if gas revenue is neglected land requirement is also relatively small but depends on type of past treatment adopted	Highest treatment efficiency with crystal quality power requirement is 50% of conventional technologies land requirement is less than 50% of conventional technologies														
Selected Alternative	Selected processes: Sequential batch reactor (SBR) The genesis of selecting a suitable treatment process is primarily correlated with degree of treatment aimed to be achieved. In India, the latest court Order of April 2019 (National Green Tribunal (NGT) Order dated 30 April 2019) mandates all the civic authorities to adopt the treated sewage characteristics applicable are as shown in table below: <table><tr><th>Parameter</th><th>Standards</th></tr><tr><td>BOD, mg/l</td><td>10</td></tr><tr><td>TSS, mg/l</td><td>20</td></tr><tr><td>COD, mg/l</td><td>50</td></tr><tr><td>Nitrogen-Total, mg/l</td><td>10</td></tr><tr><td>Phosphorus- Total, mg/l</td><td>1</td></tr><tr><td>Fecal Coliform (MPN/ 100 ml)</td><td>100 (permissible 230)</td></tr></table> SBR provides highest treatment efficiency possible in a single step biological process. The system is operated in a batch reactor mode this eliminates all the inefficiencies of the continuous processes. A batch reactor is a perfect reactor, which ensures 100% treatment. Separate modules are provided to ensure continuous treatment. The complete process takes place in a single reactor, within which all biological treatment steps take place sequence. The complete biological operation is divided into cycles. Each cycle is of 3 – 5-hour duration, during which all treatment steps take place.					Parameter	Standards	BOD, mg/l	10	TSS, mg/l	20	COD, mg/l	50	Nitrogen-Total, mg/l	10	Phosphorus- Total, mg/l	1	Fecal Coliform (MPN/ 100 ml)	100 (permissible 230)
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4	Treated wastewater disposal																		

Type of alternative	Treated wastewater disposal – reuse applications
Description of alternatives	(i) Discharge of treated wastewater into Water body (ii) Reuse the treated wastewater in non-potable uses Rajasthan is a water scarce region and receives low rainfall. Recognizing the importance of treated wastewater in reducing the demand on water, Sewerage and Wastewater Policy, 2016, of Rajasthan promotes the reuse of treated sewage for non-potable applications, and also to make sewerage projects environmentally sustainable. This policy prioritizes reuse in irrigation (agriculture, forestry, and landscaping), followed by fish farming, industry and non-potable domestic reuse. Policy suggests construction of storage tanks to store treated wastewater to facilitate reuse. Policy prescribes that the detailed project report (DPR) should clearly define the best reuse option specific to the town and prepare a Reuse Action Plan part of the DPR following water quality norms and legal implications. Accordingly, it is proposed to utilize the treated wastewater for non-potable uses. There are vast agricultural practices near the STP site, where there is scarcity of water for irrigation, due to which mostly rain fed agriculture is being practiced. A detailed Reuse Action Plan will be prepared during the detailed design phase, and, implemented. It is also proposed that the excess / surplus treated wastewater which is not being utilized in reuse will be discharge into natural drain located near STP, and necessary facilities – pipelines and pumping facilities, will be developed.
Selected Alternative	Reuse in non-potable applications and discharge excess/surplus into natural sessional drain located near STP site
5	Project Locations
Description of alternatives	Location of CWR and pump houses. Under RUSDP, all the required structures are to be proposed only on Govt. lands to avoid any land acquisition. In Sagwara; CWR and pump houses are proposed in the existing PHED campuses. There are sufficient vacant lands available for the construction of these structures at these locations. Therefore no alternative locations are required to be considered for construction of these structures. STP location. Based on the technical feasibility of gravity flow system, sewerage system in Sagwara is designed and optimized with one sewage treatment plant (STP) of 3.6 MLD capacity. Site selection is guided by technical suitability, availability of government owned vacant land, adequate land parcel, site away from habitation, and where there is a channel to discharge the treated wastewater. As per natural topography this is a low line area & natural slope of town is towards this locality therefore this location is suitable for STP. Site selected for construction of STP is govt. land under Municipal Council, Sagwara; away from habitations and surrounded by agricultural lands, proposed near BSNL Exchange Office/Central Jail). Considering the selected superior and compact sewage treatment technology (SBR), the STP site is selected which is suitable for the construction of STP and therefore no site alternative is considered. Water distribution and sewer lines. Sewer and water supply pipes are proposed along the roads/streets in the town within the road right-of-way (ROW). In wider roads water pipes will be laid in the road shoulder beside the tarmac, and in narrow roads, where there is no space, pipes will be laid in the road carriage way by break opening the tarmac. Sewers will be mostly laid in the centre of the road, away from water pipes. Existing water distribution network is mostly Asbestos cement (AC) pipes and CI. There is requirement of placing new pipe lines in place of old AC pipes, the existing AC and CI pipes shall be made abandoned and left in situ and new pipe lines shall be laid parallel to it, therefore it will not attract specific mitigation measures for demolition, handling, transportation and disposal. Assessment of quantity of replacement of AC pipes is

	required before start of construction works. However, to lay the new water supply pipe lines, the alignment will be fine-tuned during the detailed design, to avoid existing AC pipe alignments as far as possible. SPS Location. Sewage pumping station is proposed in vacant government land on the basis of natural gradient and drainage pattern of town, availability of government land with no any other use, adequate land parcel, site away from habitation etc. There are no any habitations within 100 m. radius of proposed site, nearest habitation is about 110 m away from site, therefore this site is suitable for construction of proposed SPS and no site alternative is considered.
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IV. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORKS

A. ADB Safeguard Policy

40. 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.

41. 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.
- (iv) **Category FI.** A proposed project is classified as category FI if it involves investment of ADB funds to or through a FI.

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

43. **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.

44. **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.

45. **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.

46. **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.

47. **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.

48. **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.

49. **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

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.

and EMP to assess the potential impacts, evaluate the alternatives, and outline mitigation measures and resources to address those impacts.

50. 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.

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

52. 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.

53. 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

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.

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>

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

54. 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.

55. **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.

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

57. **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.

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

59. **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 11.

C. Environmental Regulatory Compliance

60. **Table 10** presents a summary of environmental regulations and mandatory requirements applicable to Sagwara Town water supply and sewerage system works subproject.

Table 10: 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 And Rajasthan Environment Mission and Climate Change Agenda for Rajasthan (2010-14)	Follows the National Environment Policy, 2006 and core objectives and policies are: -Conserve and enhance environmental resources; assure environmental sustainability of key economic sectors; and, improve environmental governance and capacity building - it recommends specific strategies and actions to address the key environmental issues: water resources, desertification and land degradation, forest and biodiversity, air quality, climate change: adoption and mitigation, mining, industry, tourism, energy, urban development, etc. - Establishment of Environment Mission under the chairpersonship of the Chief Minister and a Steering Committee under the chairpersonship of Chief Secretary, Government of Rajasthan Tasks force set up for six key areas	Project implementation should adhere to the policy aims of: conservation and enhancement of environmental resources, integration of environmental concerns into projects/plans, and capacity building in environmental management. Under water sector, major concerns, as the policy notes, are huge water losses and wastage, declining water availability, pollution. Relevant recommendations for the project include control of losses, integrated water resources management, control of raw water pollution ¹⁸ , reuse and recycling. Avoid/minimize use of forest lands. With reference to climate change adoption and mitigation following should be considered in the project: (i) diminishing flows in surface water bodies, and groundwater depletion, and revival traditional water bodies as water sources (lakes/tanks);	All phases of project

Law	Description	Requirement	Relevance to Project Phase
		(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 requires EIA study and environmental clearance.	None of the components of this subproject falls under the ambit of the notification; no EIA study or environmental clearance required	-
Central Ground Water Authority Public Notice 2/100	Public Notice specifies districts and areas where there are restrictions on the construction and installation of any new structure for extraction of groundwater resources without specific approval from the CGWA	Subprojects belonging to the Notified Areas in the Public Notice and will require new structures on extracting groundwater should seek the permission from the Central Groundwater Authority	Not applicable
Public Health Engineering Department Office Order P5 (1) PHE-2010 dated July 14 2020	PHED Office Order states that the State Government is instructed that permits for any new tube wells, bore wells or any structures extracting ground water shall be secured from the District Collector	Subprojects with components shall secure permits from the District Collector for components that include any new tube wells, bore wells or structures extracting groundwater	Not applicable
Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments (1987)	Act was enacted to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water, by Central and State Pollution Control Boards and for conferring on and assigning to CPCB/SPCBs powers and functions relating to water pollution control. Control of water pollution is achieved through administering conditions imposed in consent issued under provision of the Water (Prevention and Control of Pollution) Act of 1974. These conditions regulate the quantity and quantity of effluent, the location of discharge and the frequency of monitoring of effluents. Any component of the subproject having the potential to generate sewage or trade effluent will come under its purview. Such projects have to obtain Consent to establish	Proposed one STP will require CTE (prior to start of construction works) and CTO (prior to start of operation) from Rajasthan State Pollution Control Board (RSPCB) All relevant forms, prescribed fees and procedures to obtain the CTE and CTO can be found in the RSPCB website. (http://environment.rajasthan.gov.in)	Construction and Operation

Law	Description	Requirement	Relevance to Project Phase
	(CTE) under Section 25 of the Act from Rajasthan State Pollution Control Board (RSPCB) before starting implementation and Consent to Operate (CTO) before commissioning.		
Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments.	This Act was enacted to achieve prevention, control and abatement of air pollution activities by assigning regulatory powers to Central and State boards for all such functions. The Act also establishes ambient air quality standards. The projects having potential to emit air pollutants into the atmosphere have to obtain CTE and CTO under Section 21 of the Act from RSPCB. The occupier of the project/facility has the responsibility to adopt necessary air pollution control measures for abating air pollution.	The following will require consent to establish (CTE) and consent to operate (CTO) from Rajasthan State Pollution Control Board (RSPCB): (i) Diesel generators (more than 15 KVA); (ii) Batching Plant hot mix plants; and (iii) stone crushers, if installed for construction. All relevant forms, prescribed fees and procedures to obtain the CTE and CTO can be found in the RSPCB website (http://environment.rajasthan.gov.in) If ready mix concrete and hot mix bitumen is procured from third party, contractor has to ensure that the plants, from where material is being purchased is having CTE/CTO and copy should be collected from third party and submitted in PIU	Construction and operation
Biodiversity Act of 2002	This Act primarily addresses access to genetic resources and associated knowledge by foreign individuals, institutions or companies, to ensure equitable sharing of benefits arising out of the use of these resources and knowledge to the country and the people.	None of the components of the subproject are located within the protected Area.	-
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	None of the components of the subproject are located within the protected Area. Therefore, this act is not applicable.	Not Applicable

Law	Description	Requirement	Relevance to Project Phase
	authority, penalty clauses and other important regulations.		
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 pollution, including standards for quality of air, water, noise, soil; discharge standards or allowable concentration limits for environmental pollutants, handling of hazardous substances, locating/prohibiting industries, etc.,	There are rules / notifications that have been brought out under this Act, which are relevant to RSTDSP, and are listed below	Construction and operation
Environmental Standards (ambient and discharge).	Emissions and discharges from the facilities to be created or refurbished or augmented shall comply with the notified standards	Appendix C-2 provides ambient air quality standards, 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-8 provides applicable noise standards	Construction and operation
Indian Drinking Water Standards	Gives details of the permissible and desirable limits of various parameters in drinking water as per the Bureau of Indian Standards	Appendix C-6 provides drinking water standards	Construction and operation
Solid Waste Management Rules 2016	Responsibility of Solid Waste Generator	Contractor to follow all the rules during construction works	Construction and operation

Law	Description	Requirement	Relevance to Project Phase
	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.		
Construction and Demolition Waste Management Rules 2016	(i) Every waste generator shall segregate construction and demolition waste and deposit at collection centre or handover it to the authorized processing facilities (ii) Shall ensure that there is no littering or deposition so as to prevent obstruction to the traffic or the public or drains (iii) Large generators (who generate more than 20 tons or more in one day or 300 tons per project in a month) shall submit waste management plan and get appropriate approvals from the local authority before starting construction or demolition or remodeling work, (iv) Large generators shall have environment management plan to address the likely environmental issues from construction, demolition, storage, transportation process and disposal / reuse of C & D Waste. (v) Large generators shall segregate the waste into four	Construction waste shall be collected at stockpile area for 8-10 days and will be sent to disposal site. Disposal site shall be identified and allotted by Municipal Council 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 these Rules	Construction

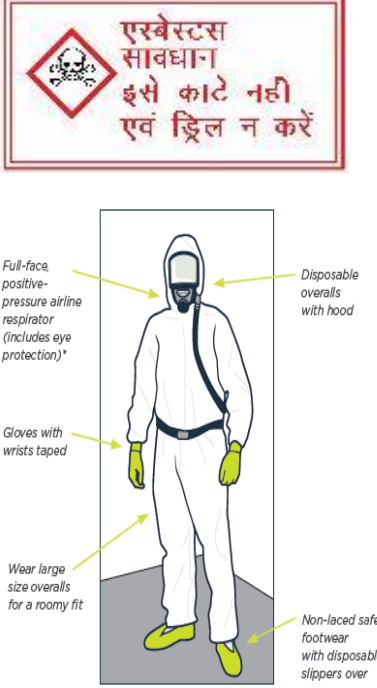
Law	Description	Requirement	Relevance to Project Phase
	streams such as concrete, soil, steel, wood and plastics, bricks and mortar, (vi) Large generators shall pay relevant charges for collection, transportation, processing and disposal as notified by the concerned authorities;		
Hazardous and Other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

Law	Description	Requirement	Relevance to Project Phase
	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 Validation) Act, 2010.	The Act designates areas within 100 meters (m) of the “protected monument/area” as “prohibited area” and beyond that up to 200 m as “regulated area” respectively. No “construction” is permitted in the “prohibited area” and any construction activity in the “regulated area” requires prior permission of the Archaeological Survey of India (ASI).	No ASI Monuments falls under impact area of any of the component of this project.	Not applicable
The Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961; the Rajasthan Monuments, Archaeological Sites and Antiquities (amendment) Act 2007	Any construction/excavation work in the ‘protected area’ (as declared by GoR under the Act) requires priori permission of Department of 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-.	Not applicable - there are no state protected monuments in the town	Not applicable
The Building and Other Construction Workers (BOCW) Act 1996 and Rajasthan Building and	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	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	Construction

Law	Description	Requirement	Relevance to Project Phase
Construction Workers Rules 2009	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, 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	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 Section 82- H&S policy Section 83- dangerous and harmful environment Section 84- Overhead protection Section 88- eye protection Section 89- PPEs Section 90- electrical hazards Section 97- use of safety helmets and shoes Chapter XIII-lifting appliances and gears Chapter XV- transport and earth moving equipments Chapter XVI- concrete works Chapter XVII- demolition works Chapter XVIII-Excavation and tunneling Chapter XX- ladders and step ladders Chapter XXII- structural frame and formworks Chapter XXIV- medical facilities and first aid box	

Law	Description	Requirement	Relevance to Project Phase
	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 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	• Applicable to all construction works in the project • Principle employer (RUDSICO-EAP) to obtain Certificate of Registration from Department of Labour, as principal 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.,	Construction and operation

Law	Description	Requirement	Relevance to Project Phase
	as housing, medical aid, traveling expenses from home up to the establishment and back, etc.,	Appendix 12 provides applicable labor laws including amendments issued from time to time applicable to establishments engaged in construction of civil works.	
The Child Labour (Prohibition and Regulation) Act, 1986	Prohibits employment of children below 14 years of age in certain occupations and processes Employment of child labor is prohibited in building and construction industry.	No child labour should be employed	Construction and operation
Minimum Wages Act, 1948	Minimum wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of buildings, roads and runways are scheduled employment.	Applicable to all construction works in the project All construction workers should be paid not less than the prescribed minimum wage	Construction and operation
Workmen Compensation Act, 1923	Provides for compensation in case of injury by accident arising out of and during the course of employment.	Compensation for workers in case of injury by accident	Construction and operation
Equal Remuneration Act, 1979	Provides for payment of equal wages for work of equal nature to male and female workers and not for making discrimination against female employees in the matters of transfers, training and promotions etc.	Equal wages for work of equal nature to male and female workers	Construction and operation
Rajasthan Forest Act, 1953 and Rajasthan Forest Rules, 1962	This Act makes the basis for declaration of Reserved Forests, constitution of village forest committees, management of reserved forests and penalties and procedures.	Not applicable; none of the components/pipeline alignment are in reserved or community forest areas.	Construction
IS 11768: 1986/2005: Recommendations for disposal of asbestos waste material	The standard emphasizes that every employer who undertakes work which is liable to generate 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 on minimal waste generation. Waste Collection: In the project circumstance, the waste is referred to the damaged powered asbestos which will be collected in the Permissible plastic bags to be disposed to the nearest TSDF facilities.	Construction

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

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

Law	Description	Requirement	Relevance to Project Phase
	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.		

61. **Clearances / permissions to be obtained prior to start of construction. Table 11** 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 11: Clearances and permissions required for Construction activities

S. No	Construction Activity	Statute under which Clearance is Required	Implementation
1	Land for project activity	Allotment and approval for specific land use	ULB
2	Pipe laying works	Permission from Nagar Palika and PWD (where applicable)	PIU
3	Establishment of construction camps	Allotment and approval for specific land use	Contractor
4	Construction of new STP	Consent to establish and consent to operate under Water Act, 1974 from RSPCB	PIU & Contractor
5	Tree Cutting	State forest department/Revenue (Tehsildar)	PIU
6	Hot mix plants, Crushers, Batching plants and DG Set	Consent to establish and consent to operate under Air Act, 1981 from RSPCB	Contractor
7	Storage, handling and transport of hazardous materials	Hazardous Wastes (Management and Handling) Rules, 2016 Manufacturing, Storage and Import of Hazardous Chemicals Rules, 1989 from RSPCB	Contractor
8	Sand mining, quarries and borrow areas	Permission from District Collector/ State Department of Mines & Geology	Contractor
9	New quarries and borrow areas	Environmental clearance under EIA Notification 2006	Contractor
10	Use of vehicles and equipment	Pollution under control certificate (PUC) form RTO	Contractor
11	Temporary traffic diversion measures	Temporary traffic diversion measure including use of alternate road from District traffic police	Contractor
12	Use of Railways ROW for construction area/ crossing	Indian Railways	PIU

S. No	Construction Activity	Statute under which Clearance is Required	Implementation
13	Use of highway ROW for construction area/crossing	National Highway Authority of India	PIU

62. PMU will be overall responsible for supervision in getting all clearances and provide details to ADB through semi-annual report. PMU will ensure all necessary regulatory clearances and approvals are obtained prior to commencement of works. Respective PIUs, with support of project consultants and DBO contractors, are responsible for obtaining the clearances/permits and ensuring conditions/specifications/provisions are incorporated in the subproject design, costs, and implementation. The PIUs shall report to PMU the status of compliance to clearances/permits as part of the regular progress reporting.

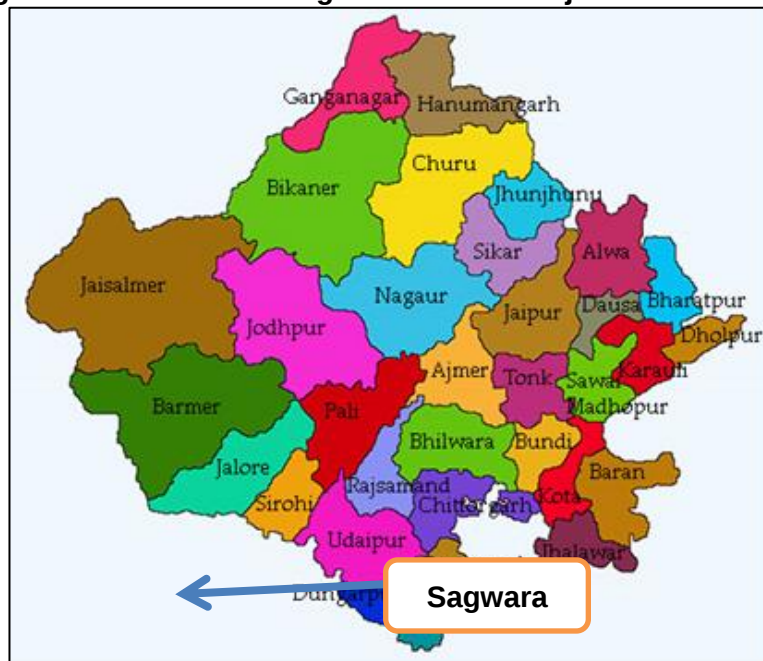
V. DESCRIPTION OF ENVIRONMENT

A. Physical Resources

1. Location, Area & Connectivity

63. Sagwara is a city and a municipality in Dungarpur district in the Indian state of Rajasthan. Sagwara is located at 23.68°N 74.02°E. The elevation is 244 m above MSL. The geographical area of the city is about 7.68 Sq. Km. Sagwara is famous for sculpture, marble carving, temple architecture and gold jewellery. It is a major trading hub for nearby villages.

Figure 17: Location of Sagwara Town in Rajasthan State Map



1. Topography, Soils and Geology

64. **Topography:** the district is characterized by low-lying hills intervening with valleys and rocky plains and can be broadly divided in three distinct unit viz. Rocky uplands, Erosional valleys and pediplains. The area is drained by Mahi and its tributaries like Nori, Jakam, Gomti, Saren, Ghorel and Moran. The general topographic elevation in the district is between 200m to 250m above mean sea level in most of the blocks. Elevation ranges from a minimum of 112 m amsl in Simalwara block in the southwestern part of the district to a maximum of 545.6 m amsl In Bichhiwara in north-western part of the district. The Minimum Elevation of Sagwara is 113.2 (m asml) and Maximum Elevation is 348.5 (m asml).

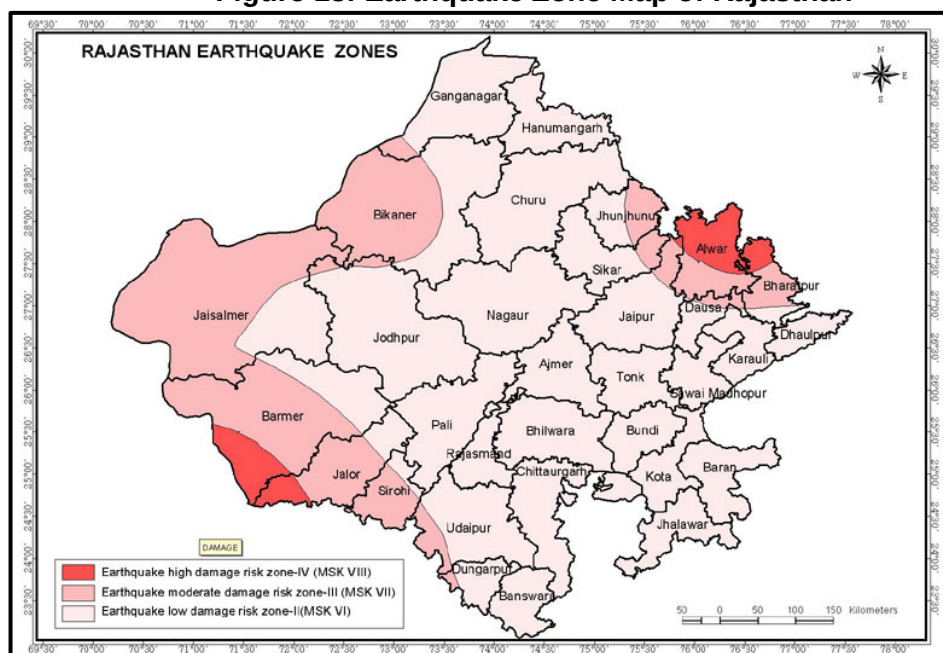
65. The rugged and wild aspect of the region is attributed to the off shoots of the Aravallis. The district is broken and hilly, but none of the hills attain a great height. The highest peak which is in the extreme northwest is about 572 m above mean sea level and the other highest point 2 km north of Sagwara is 497 m above mean sea level. The lowest point in the district is about 90 m above mean sea level near Solakari village in the bed of Mahi River.

66. **Soil:** There are pre-dominantly two types of soils in the district. Red loam soils are found in the south-eastern parts of the district, adjoining Gujarat border. These are soils of hilly plains (flats) i.e., brought down from nearby hills and deposited in low lying areas. They are characteristically shallow to moderately deep, reddish in colour medium in texture, sandy loam to loam in nature, non-calcareous, granular, well drained, free of salts and may have slight calcareous carbonates in lower layers. Hilly soils are found along the hill ranges of Aravallis in the northern and western parts of the district. These soils are very shallow with gravelly material, very near to the surface. These are in general, light in texture and reddish brown to greyish brown in colour, non calcareous and freely drained. These extend in small patches on uneven terrain.

67. **Geology:** The district is underlain by mainly hard rock formations belonging to Bhilwara Supergroup and Aravalli Supergroup intruded by granite. Along the major river courses, localized patches of shallow alluvium occur overlying the compact basement.

2. Seismology

68. According to the Vulnerability Atlas of India, most of Dungarpur District, including Sagwara Town, is in an area of low earthquake risk (Zone II). Although Rajasthan has not experienced a major earthquake in the recent past, there have been 37 events with a magnitude of 5-7 since 1720, with the most recent occurring in 2001. This measured 6.9 on the Richter Scale, but because the epicentre was in neighbouring Gujarat, there was only limited damage in Sagwara. Earthquake Zone Map of Rajasthan is shown in **Figure 18**.

Figure 18: Earthquake Zone Map of Rajasthan

3. Climatic Conditions

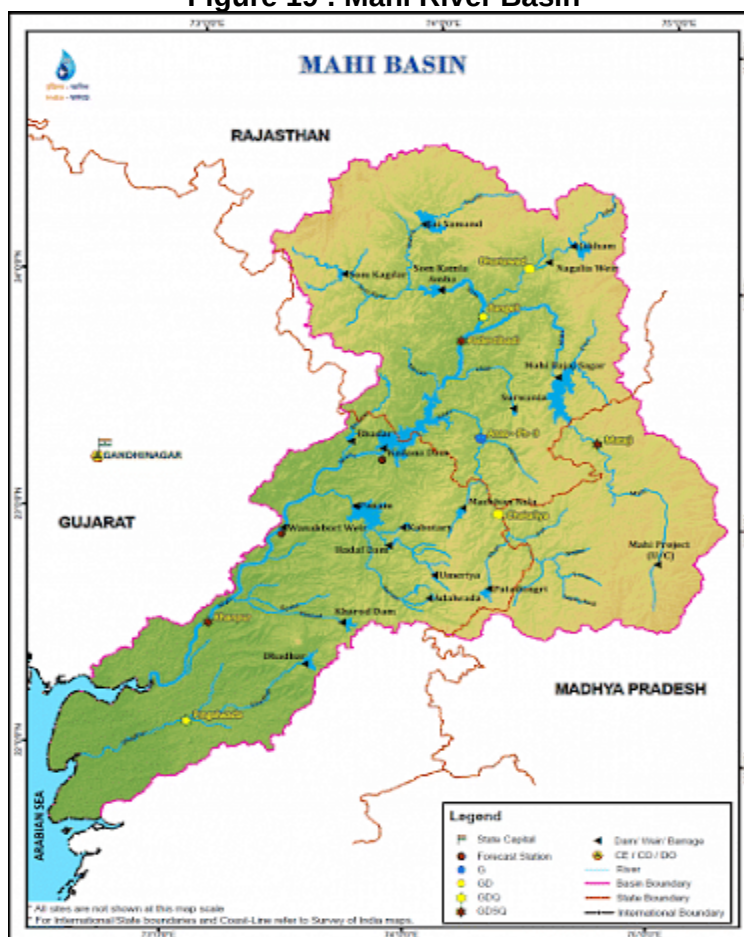
69. The climate of Sagwara is semi dry arid, typical of desert. The maximum temperature during summer months goes above 36°C quite frequently. The temperature during winter months normally touches 10°C. Average rain fall is 324 mm. The Dungarpur district has a dry climate with a hot season from April to June; however, the climate is milder than in the desert regions of Rajasthan to the north and west. The maximum temperature in the district occurs during the hot season and ranges between 40° to 45° Celsius. The minimum temperature ranges between 10° and 12° Celsius, usually occurring in January. The monsoon season, which runs from June through September, brings almost the only rain to much of the district, but some rain may fall from November through February. The annual rainfall varies extensively over the district from up to 880 mm in Dungarpur town in the northwest to under 500 mm at Nithawa in the northeast. But the rainfall is quite variable from year to year, as Nithawa had 805 mm in 2013 but only 465 mm in 2014.

4. Surface Water

70. The district is drained mainly by the rivers Som and Mahi. The Mahi is perennial river of Rajasthan forms the natural boundary between Dungarpur and Udaipur districts and separates Dungarpur district from Banswara district. The Mahi river originates from the Mahi Kanta hills in the western part of Madhya Pradesh and enters Banswara and Dungarpur districts before entering Gujarat near village Salakari. On an average, the river bed is about 100m to 130 m in width and mostly rocky. Its banks are steep in many parts though not very high. Its length in Dungarpur district is about 110 km. The Som river flows southeast from hills near Bichhabhera in Udaipur district, till it meets the border of Dungarpur district. It then turns first to the east and then to the south forming the northern boundary. After meeting the Jhakham, it enters the Dungarpur district and after traversing for a few km down it meets river Mahi at Baneshwar. The river traverses through the district for a distance of about 84 km. Moran a seasonal river emerges in the central part of the district and flows in the southeastern direction to find its way into the Mahi.

There are various streams like Jhakham, Majhham, Vatrak, Bhader, Gangli, Sapan and Very Ganga. All these dry up during summer. The seasonal nallahs are Nagdari, Phallu, Padar, Mahaya and Kadva Bagaria.

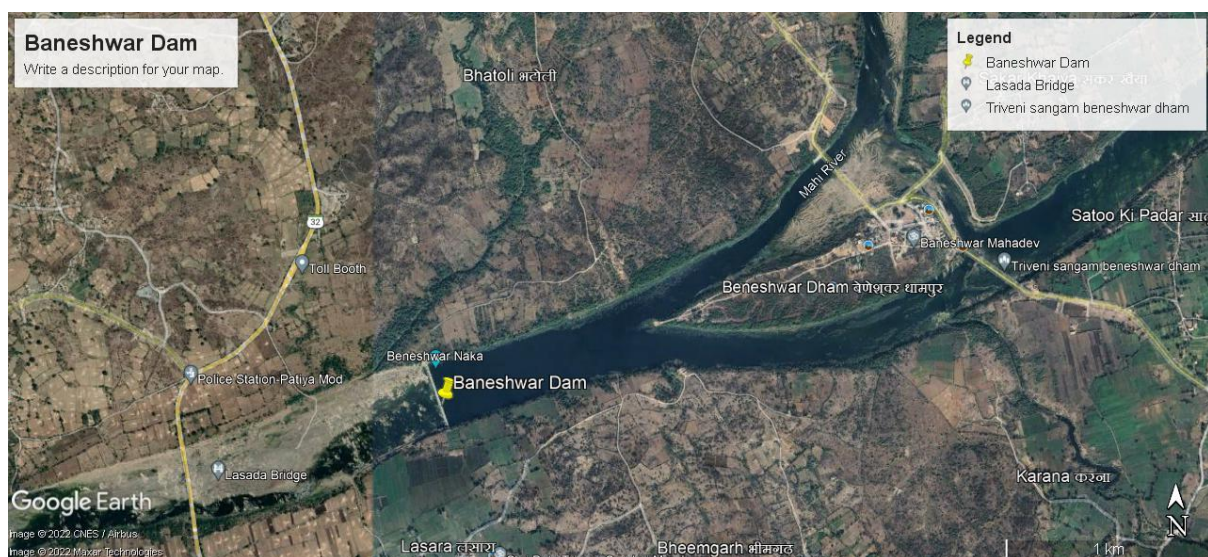
Figure 19 : Mahi River Basin



71. **Beneshwar Anicut:** Beneshwar Anicut which is about 29 Km from Sagwara town. The Anicut situated about 3 Km from tehsil head quarter Sabla. Salient features of the Anicut are as follows:

- (i) **Location.** The Anicut situated about 3 Km from tehsil head quarter Sabla. The latitude and longitude are 23°58'00" and 74°02'00" respectively. The site is approachable by a tar road from Aspur-Banswara road from Sabla and about 60 km from district head quarter Dungarpur. The Length of Baneshwar Anicut is 387 meter and height is 7.25 meter and its construction has been done as Anicut with broad crested weir. There are 79 numbers of openings at different elevation to regulate discharged of Mahi river. Gates are lowered and raised manually for regulation of river discharged. The gates are fixed and removed manually after monsoon and before monsoon respectively to maintained required water level in the Anicut. Storage capacity of Anicut is 8.78 MCM or 320 Mcft.

Figure 20: Location of Baneshwar Anicut



- (ii) **Catchment Area.** The gross catchment area is about 15988 sq km and general bed slope is 1:720. The peak flood discharge worked out to 13,93,311.85 cusecs. Combined discharge of Mahi, Som and Jakham passes through this Anicut. Major dams i.e. Mahi Bajaj Sagar Dam, Som Kamla Amba Dam and Jakham Dam are in upstream of Anicut. Catchment area mostly hilly and fan shaped can be classified as “good” according to Strange’s table.
- (iii) **Site for water intake.** The site was selected looking to pilgrim place Beneshwar Dham. It was constructed to facilitate pilgrim who came here for their rituals. Anicut storage water also provide irrigation facilitate of both banks of the river. Submergence area is within limits of the river banks. Mahi and its tributaries Som and Jakham meets at Beneshwar dham to form the confluence of three rivers
- (iv) **Climate.** The site is situated in sub-tropical, sub humid to humid climate conditions characterized by mild winter and moderate summers with high relative humidity during the month of July to September. The area experience mean monthly minimum temperature ranging from 11°C (January) to 26°C (June) and mean monthly maximum temperature ranges from 21.8°C (January) to 43.8°C (May) with some times goes up to 46°C.
- (v) **Rainfall and runoff.** The catchment area is too big i.e., 15,988 sq.km. spreading across Rajasthan and Madhya Pradesh and there are nos. of rain gauge stations in the catchment area. The nearest rain gauge station is at Sabla and annual rainfall is 750 mm. Runoff: Peak flood discharge considered as 13,93,311.85 Cusecs (worked out from Dicken’s Formula). A river gauging site (G&D site) of C.W.C. located at about 15 km in downstream at Padardi-Badi location.
- (vi) **Submergence.** The storage capacity of Anicut is 310 Mcft and submergence is within the limit of the river boundaries. Detailed source sustainability report of Beneshwar anicut is attached as Appendix 6

- (vii) **Surface water Quality.** Samples of raw water at Baneshwar Anicut were collected on 28.03.2022 and tested by PHED lab Dugarpur and test report shows that water quality of treated water is well within the desirable limits of National drinking water standards. Test Results are given below in Table.

Table 12: Water quality result at Baneshwar Anicut

National Standards for Drinking Water ^a			WHO Guidelines for Drinking-Water Quality, 4 th Edition, 2011 ^b	Beneshwar Anicut
Parameter	Unit	Max. Concentration Limits ^c		
Turbidity	NTU	1 (5)	-	
pH		6.5 – 8.5	none	7.2
Color	Hazen units	5 (15)	none	
Taste and Odor		Agreeable	-	
TDS	mg/l	500 (2,000)	-	
Iron	mg/l	0.3	-	
Manganese	mg/l	0.1 (0.3)	-	
Arsenic	mg/l	0.01 (0.05)	0.01	
Cadmium	mg/l	0.003	0.003	
Chromium	mg/l	0.05	0.05	
Cyanide	mg/l	0.05	none	
Fluoride	mg/l	1 (1.5)	1.5	0.4
Lead	mg/l	0.01	0.01	
Ammonia	mg/l	0.5	none established	
Chloride	mg/l	250 (1,000)	none established	140
Sulphate	mg/l	200 (400)	none	
Nitrate	mg/l	45	50	10
Copper	mg/l	0.05 (1.5)	2	
Total Hardness	mg/l	200 (600)	-	130
Calcium	mg/l	75 (200)	-	
Zinc	mg/l	5 (15)	none established	
Mercury	mg/l	0.001	0.006	
Aluminum	mg/l	0.1 (0.3)	none established	
Residual Chlorine	mg/l	0.2	5	
E-coli	MPN/100ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	
Total Coliform	MPN/100ml			

^a Bureau of India Standard 10500: 2012.

^b Health-based guideline values.

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

5. Groundwater

72. The principal source of ground water recharge is precipitation. Out of the total, rainfall received, a major part is lost as runoff and evapotranspiration through soil and vegetation. Only a small portion of rainfall infiltrates down to join the ground water body. Central Ground Water Board periodically monitors the National Hydrograph Network Stations (NHNS) in the Dugarpur district, four times a year i.e., in January, May (Pre - monsoon), August and November (Post - monsoon). Sagwara fall into 'Semi Critical' category as development has reached very close to the limit and any further development would lead to exhaustion of dynamic ground water

resources in these areas. Depth to water level during pre-monsoon varies from 1.7 to 55.32 mbgl. During post monsoon period, the depth to water level varies from 0.46 mbgl. In general depth of water level varied from 5 to 20 mbgl. The overall stage of ground water development in the district is 77.56%.

73. Samples of six tube wells at Sagwara rown were collected on 02.05.2022 and tested by PHED lab Dugarpur and test report shows that water quality of treated water is well within the desirable limits of National drinking water standards except for TDS and hardness which was above the desirable limits but with the maximum limits allowed in the absence of alternate source. Test Results are given below in Table

74. After commission of subproject, during summer or during repair maintenance of systems when reduced flow will be available from anicut. The ground water shall be used after blending with surface water. The blending with surface water will keep water quality within the permissible drinking water limits and water quality shall be monitored on regular basis before supplying it to the town.

Table 13: Water quality result at Ground water quality at Sagwara town

National Standards for Drinking Water^a			WHO Guidelines for Drinking- Water Quality, 4th Edition, 2011^b	Tube well no 4, Gamath wara colony	Tube well no 2, Gamath wara colony	Tube well, C Block	Tube well no 4, Doordarshan Kendra	Mahajan well	Khatik well
Parameter	Unit	Max. Concentration Limits^c							
Turbidity	NTU	1 (5)	-	0.20	0.2	0.1	0.2	0.3	0.3
pH		6.5 – 8.5	none	7.4	7.4	7.6	7.7	7.8	7.9
Color	Hazen units	5 (15)	none						
Taste and Odor		Agreeable	-						
TDS	mg/l	500 (2,000)	-	720	740	610	660	550	530
Iron	mg/l	0.3	-						
Fluoride	mg/l	1 (1.5)	1.5	0.53	0.54	0.52	0.52	0.48	0.54
Lead	mg/l	0.01	0.01						
Ammonia	mg/l	0.5	none established						
Chloride	mg/l	250 (1,000)	none established	140	150	120	140	100	100
Sulphate	mg/l	200 (400)	none						
Nitrate	mg/l	45	50	39	42	24	25	12	18
Copper	mg/l	0.05 (1.5)	2						
Total Hardness	mg/l	200 (600)	-	320	340	280	300	250	250
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								

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

6. Air Quality

75. No data on ambient air quality or noise levels available for Sagwara town, which is not subjected to monitoring by the Rajasthan State Pollution Control Board (RSPCB). The contractor is required to conduct ambient air quality and noise level monitoring in Sagwara in the pre-construction phase to establish the baseline at project sites, and will continue periodic monitoring as per the environmental management plan.

7. Noise Quality

76. There are no industrial or heavy development activities in the municipal areas of Sagwara town, therefore noise quality in town is almost good though due to vehicular movements noise is increased as compared to prescribed limits. Noise level quality of Sagwara is not available and DBO contractor is required to conduct noise level monitoring of Sagwara at prominent project sites, in the pre-construction phase and will update in IEE report.

B. Ecological Resources

77. **Protected areas.** The nearest wildlife sanctuary is Sita Mata Sanctuary located 65 km from project town. In the forest blocks of Ghatamaawita protected forest, KAANTHAL A protected forest and Od Paadwa protected forest some wild animals like blue bull, sambar, Jackal, jungle cat, deer, wild boar, monkey, wild dogs etc. have been observed. But there is no notified breeding or nesting bird site/ecological sensitive area/Ramsar convention site/Area notified under Wild Protection Act-1972 in these forest blocks as well as in town.

78. **Wildlife.** In the forest blocks especially in Ghatol and Pipalkhut forest block, some wild animals are observed which are blue bull, sambar, Jackal, jungle cat, deer, wild boar, monkey, wild dogs etc. Our experts were told by locals that reptiles like common garden lizard (*Chameleon zeylanicaul*), common Indian monitor (*Varanus beagalansis*), Indian Cobra (*Naja naja*), and Krait (*Bungarus coerulens*) are rarely found in agriculture fields during rainy season. Common birds found in the region are little egret (*Egretta garzetta*), Common Green Pigeon (*Treronphoenicoptera*), Blue Rock Pigeon (*Columba livia*), House swift (*Apus affinis*), Pheasant tailed Jacana (*Hydrophasianus chirurgus*) etc. No rare or migratory birds are reported in the project areas.

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

80. Biodiversity Assessment Report (IBAT Analysis) for Water Supply (CWR) and Sewerage system (STP located at Near BSNL Exchange Office/Central Jail at Sagwara town and near by 50 km has been generated and attached with this report as **Appendix 5**. The screening study for critical habitation indicates that within the area of analysis (AOA) there are no known species which would qualify the area as critical habitat under the set criteria (criterion 1–5, as presented in the report). As per IBAT report; within 50 km radius of STP. There are 15 species of concern

fauna listed as IUCN Red list, most of which are wild species and not reported in urban areas of Sagwara. The nearest wildlife sanctuary is Sita Mata Sanctuary located 65 km from project town. Proposed activities will not have impact on these species.

C. Economic Development

1. Land use

81. Sagwara Master Plan provides land use details of the town. Out of total 1,946 acre urban area, 38.53 % is developed urban area. Rest of the land is under water body and vacant and agricultural land. Details of the land use is provided in **Table 14** below-

Table 14: Existing Land Use of Sagwara

S. No.	Land Use	Area (in Acres)	Percentage of Developed area (%)	Percentage of Urban area (%)
1	Residential	1582	58.80	55.90
2	Business	144	5.40	4.80
3	Industrial	199	7.40	6.60
4	Govt. / Semi Govt.	14	0.50	0.50
5	Recreation	36	1.40	1.20
6	Public and Semi Public	195	7.30	6.50
7	Transport, roads and Recirculation	517	19.20	17.30
	Developed Area	2687	100.00	89.80
8	Agriculture	58	-	1.9
9	Open land	213	-	7.1
10	Water body	32	-	1.20
	Total Urban area	2990	-	100.00

*Source: Master Plan Sagwara 2011-2031

2. Commerce, Industry & Agriculture

82. Tiles and marble industry are the main industries of the town. Sagwara is not very much developed from industrial development point of view. Currently, 20 acre land is being used for the industrial development which is 2.68 % of the total developed area.

83. **Agriculture.** The agriculture in the district is characterized by recurrent droughts, sloppy lands, dominance of low value and low demand crops, inadequate infrastructure, small size of land holding, poor irrigation sources, poor livestock productivity, lack of off farm employment opportunities, poor market support, non-availability of credit and high rate of illiteracy. The major crops of the Kharif season are maize, rice, black gram, soybean and cotton, while wheat, gram and barley are major Rabi crops. Area under Zaid green gram cultivation is increasing. Cereal

crops (maize, wheat and rice) constitute 88.12% of gross cultivated area followed by pulses (pigeon pea, gram and green gram) 11.45% and oilseeds 0.23 % (soybean).

3. Other Infrastructures

84. **Storm Water Drainage:** Sagwara town is facing severe drainage problem resulting water logging on roads and low lined areas during the rainy season, even though the rain is moderate. The surface runoff from the town finally gets accumulated in every monsoon season in the outskirts of town in low lying areas.

85. **Power Supply:** Distribution of power in the town is the responsibility of the Rajasthan State Electricity Board. Power is generated and supplied from Mahi Hydel Project, Banswara. Main electricity line is 81 kms away from the town. The major sector for electric consumption is domestic which constitute 14.53% small scale industries consume 2.48% of power.

86. **Transport:** Transport in the city is mainly by personal vehicles (motorcycles and bicycles) and auto-rickshaw and private taxis. The Rajasthan State Road Transport Corporation (RSRTC) runs public buses to neighbouring villages and towns and to larger towns farther afield. Government and private buses are also available frequently for neighbour state of Gujrat.

D. Socio Cultural Resources

1. Demography

87. As of 2011 India census, Sagwara had a population of 29349. Males constitute 14704 of the population and females 14735. Sagwara has an average literacy rate of 69.22%, lower than the national average of 75.30%: male literacy is 54.55%, and female literacy is 45.45%. In Sagwara, 12.87% of the population is under 6 years of age. Total children (0-6) are 3788 as per figures of Census India report 2011. There are 2064 boys and 1724 girls. Sex Ratio of the city is 900 per 1000 males. Sex Ratio of child is 785 per 1000 boys.

2. History, Culture and Tourism

88. Sagwara is the third largest populated place after Banswara and Dungarpur in the historical areas of Rajasthan. Majority of the population belongs to Hindu religion and it also has a significant population of Jains and Dawoodi Bohras (a Shia Islamic Muslim community). There are no any historical, cultural or important tourist places in Sagwara. The nearest ASI protected monument in Dungarpur district are Deo Somnath Temple about 35 km and Jain Temple Inscription in Baroda village about 25 km from Sagwara town.

89. The only please of tourism in Sagwara is Baneshwar Mahadev temple was established in the 17th Century. Temple is dedicated to Hindu Lord Shiva, It is located in the middle of two rivers are Mahi River & Som River about 30 Km from this city.

E. Environmental Settings of Investment Program Component Sites

90. Sewers and water supply pipes will be laid along the roads/streets in the town within the road right of way (ROW). In wider roads pipes/sewers will be laid in the road shoulder beside the tarmac, and in narrow roads, where there is no space, sewers will be laid in the road carriage way by break opening the tarmac. Roads in some part of the town are narrow. Roads are lined both sides with open drains. In narrow roads sewers will be laid in the middle of the road, which may affect the traffic. Bigger diameter trunk sewers will be laid along the main roads, which are wide

and have adequate space. No tree cutting is anticipated as there is adequate space to lay the water & sewer pipeline in those roads. Pipe networks for water supply will be laid in the entire town within the existing RoW. There is sufficient space available for laying of pipeline. These works will require advance permission from concerned authority for road cutting and traffic diversion etc. If any tree cutting will be required during execution mitigation measures shall be adopted.

91. STP (3.6 MLD) is proposed near BSNL Exchange Office/Central Jail on vacant government land under Municipal Council. There are 11 trees present at site. 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. There are only agricultural activities in the periphery of this site. There are no habitations within 150 mtrs of the proposed site. No wildlife is reported in this area. The Minimum distance of territorial forest blocks is 2 km of proposed STP site.

92. A SPS (1 MLD) is proposed in Puranwas colony. No wildlife exists near the proposed site of SPS. There are 2-3 trees present at this site, 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. No habitations exist within 100 mtrs. from the proposed site. However, all the precautions should be taken during construction and operation to minimize the impacts on nearby residents.

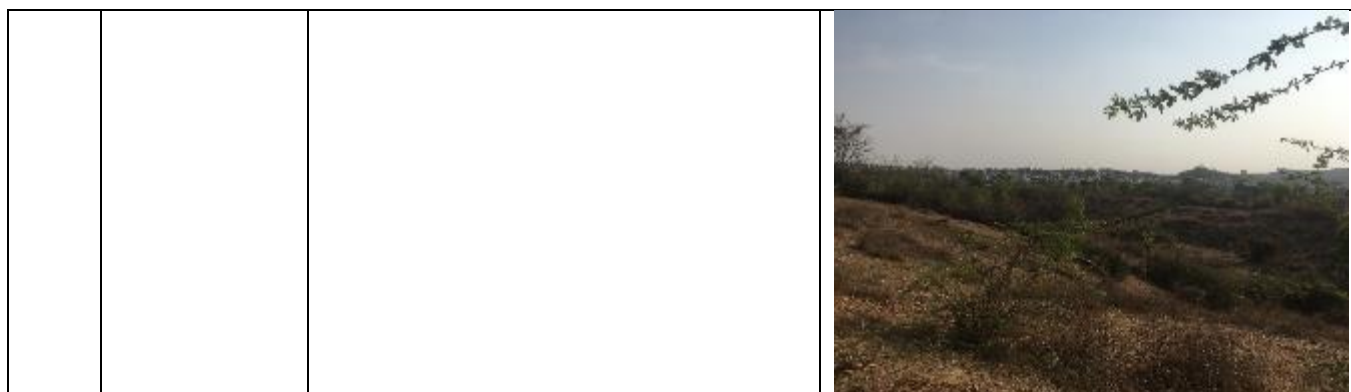
93. CWRs and pump houses are proposed at new source campus near gas godam, where there is enough space available for construction of these structures. There are no habitations within 100 meters distance from proposed site. No trees are present at Raisar and Rana Rao headworks, whereas 2-3 trees are present in A.En campus headworks, which may be saved through careful selection of layout in the existing available vacant land within campus. No wildlife is reported at any site.

94. Site environmental features of all subproject sites and photographs are presented in the following Table 15. Geographical position coordinates of all project sites are given in **Table 8**. Photographs showing the proposed components are given in **Appendix 3**.

Table 15: Environmental Features of Project sites

S. No.	Proposed Structure	Env. Sensitivity	Photo
1.	Water distribution pumping station on Galiya Kot Road Campus Latitude-23° 39' 22.02" N Longitude-74° 0' 26.45" E	• Its located on Galiya Kot Road, Sagwara • There is one govt. school which having approx. 150 m distance from proposed site • There are no major habitation nearby this location • There is no forest and wildlife area • There is no tree which the proposed construction site • There are one existing CWR and OHSR at the site • Terrain is undulating • Land area available 1000 sqm against 200 sqm required	 
2.	SPS Site Latitude-23° 39' 36.59" N Longitude-74° 0' 36.38" E	• Its located in Punarvas Colony on Galiya Kot Road, Sagwara • Nearby Habitation is Punarvas colony which having approx. 50 m distance from proposed site • There is no forest and wildlife area • There is no tree which the proposed construction site. • Terrain is plain, Site is low lying land, where waste water from nearby areas is accumulated • Land area available 5177 sqm against 500 sqm required	 

3.	STP Site, near BSNL Exchange Office/Central Jail Latitude- 23° 39' 36.59" N Longitude- 74° 0' 36.38" E	• This site is located on a small dry rainy season nala near Telephone Exchange Office, Sagwara. In this nallah water comes due to Back water of Gameshwar Talab in rainy season Nala. • This is a vacant government land and not being used for any purpose • There is a Maruti Service Centre which having approx. 100 distance from this site. • No habitations exist within 150 mt. radius of site. • Terrain is undulating • There is vegetation cover in which pre-dominated species are Juliflora, Babul and neem trees. • There will be some tree which may be impacted. These are Vilayati Babool =15, Neem=4 and Babul=7 • There are only agricultural activities in the periphery of this site. Earthen approach is only available to reach this site, which is connected to village road • There is no forest and wildlife area • Land area available 6472 sqm against 3600 sqm required	
4.	CWR, Water distribution pumping station near gas godam Latitude- 23° 41' 1.42" N Longitude- 74° 1' 32.94" E	• This proposed CWR site is located near Gas Godam on Sabla Road, Sagwara • There is no habitation within 250 m radius. • This site is located on open area at rocky small hilly surface. • There is no forest and wildlife area • There is no tree which the proposed construction site. • Terrain is undulating and hilly • Land area available 1500 sqm against 900 sqm required	



VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Introduction

95. 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.

96. 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.

97. 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).

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

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

B. Pre-Construction Impacts– Design and Location

1. Location Impacts

100. **Location Impacts of Sewage Treatment Plants.** STP (3.6 MLD) based on SBR process is proposed near BSNL Exchange Office/Central Jail with co-treatment of fecal sludge on vacant government land under Municipal Council. There are several trees present at site, which may be required to cut for construction of STP. 4 trees of neem and 7 trees of babool may be impacted. There are no habitations within 100 mtrs of the proposed site. No wildlife is reported in this area. There are agricultural activities around this site and treated effluent and sludge from STP can be utilized in these agricultural practices.

101. As per site selection criteria framed in EARF, STP site is selected with no habitation within 100 m from proposed STP site. The nearest built-up structures are Maruti service station & Central Jail/BSNL Exchange located about 150 to 250 m away from the proposed STP site. The selected STP site is in government owned site in low line area in downward side of natural slope of town making it most feasible site for STP. The selected site also has sufficient area for future expansion of the STP. The area available is 6,472 sqm against 3,600 sqm required. This is the only location option for the STP since there is no other government land available in this area.

102. **Location Impacts of proposed SPS site.** A SPS of 1 MLD is proposed in Punarvas Colony. No wildlife exists near the proposed site of SPS. Only shrubs are present and there are 2-3 trees present at site. 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. There are habitations present at a distance of 50 mtrs from proposed site. All the precautions should be taken during construction and operation to minimize the impacts on nearby residents. Additionally, public consultations should be held near the SPS location to provide project information, type of anticipated disturbances and gain the consent of the nearby residents for the construction of the proposed SPS.

103. **Odor Nuisance from STPs.** As presented in the baseline profile, the proposed STP site identified near Telephone exchange, is away from habitation, and site is currently vacant, and do not have any notable sensitive environmental features. STP sites are located away from the habitation. The proposed treatment technology, SBR, being an aerobic process and conducted in a compacted and a closed system with automated operation, odor nuisance will be very minimal.

Limited bad odors may be generated from wet well, primary treatment units and sludge treatment. Also, to account for future development potential around the sites, and to enhance the environmental benefits following measures should be included in the STP site planning and design:

- (i) Provide a green buffer zone of 10-20 m wide all around the STP with trees in multi-rows. This will act as a barrier, visual screen around the facility and will improve the aesthetic appearance. Treated wastewater shall be used for plantation; and
- (ii) Develop layout plan of STP such that odor generating units (such as sludge/ solids handling facilities) are located away from the surrounding area with future development potential.

104. Reuse/discharge of treated effluent. It is proposed to reuse the treated effluent for irrigation in agriculture, horticulture, development of urban forestry etc. Provision for ground water reservoir and elevated reservoir is made in the contract for the ease of getting required head for reuse in nearby agricultural activities. Although priority is given to reuse of treated wastewater for beneficial purposes following the Sewerage and Wastewater Policy of Government of Rajasthan, discharge point is necessary to provide for excess/surplus or when it is not reused. Therefore, it is proposed for construction of treated effluent storage reservoirs in the proposed STP for temporary storage of treated effluent before reuse.

105. Location of CWR with Pump House: the CWR with pump house are designed in the Govt. land available within existing PHED campus. No trees present at site, which may be required to be cut.

106. Location impacts of proposed pump house at Galiyakot. Proposed sit for pump house and some rehabilitation works at Galiyakot PHED campus is near to a school (approx. 150 mt. distance). No habitation existing near to this site. No trees present at site, which may be required to be cut.

107. Locations impacts of Water Supply and Sewerage Networks: The water supply and sewerage collection networks will traverse through different city roads within ROW. There are no trees coming in the alignment of proposed pipeline works. Therefore, no significant impacts shall be envisaged regarding location; though some temporary disturbances are expected and mitigation measures will be required to minimize these impacts. These works will require advance permission from concerned authority for road cutting and traffic diversion etc. If any tree cutting will be required during execution mitigation measures shall be adopted.

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

- (i) Create awareness among the workers, supervisors and engineers about the chance finds during excavation work;
- (ii) Stop work immediately to allow further investigation if any finds are suspected;
- (iii) Inform 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

109. Tree cutting at project sites. There are few trees of Babool (7 nos.) and neem (4 nos.) present at the site of STP (3.6 MLD). In preliminary design about 11 trees may be required to cut.

During detail design DBO contractor will be required to confirm exact number of trees cutting. Tree cutting requirement for pipeline works can be decided only after confirmatory survey of full length of alignment by contractor. At this stage higher side of tree cutting numbers are taken as 15 trees. As per RUDSICO-EAP policy; compensatory plantation in the ratio of 1:3 is to be followed during construction works. Therefore 45 numbers of trees are taken as compensatory plantation within STP campus to reduce foul smell and 15 numbers of trees are taken for plantation around 1 SPS.

110. There is no notable tree cover or vegetation in SPS site and other CWR/pump house sites. Water pipelines and sewers will be laid along the road within road ROW. There are no notable trees in the alignment; therefore, no tree cutting is envisaged. 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 STP, SPS, CWR or any other site with trees;
- (ii) Obtain prior permission for tree cutting at any site that may require tree cutting finalized during detailed design; and
- (iii) Plant and maintain 3 trees for each tree that is removed.

2. Design impacts

111. **Design of the Proposed Components.** The Central Public Health and Environmental Engineering Organization (CPHEEO) manual suggests a design period of 15/30 years⁶ in general while designing the systems for water supply and sewerage components. It is proposed to consider 2055 as the design year for all the components in order to maintain unanimity in the design period and design population. Accordingly, 2025 shall be the base year and 2040 the intermediate year to cross check the designs pertaining to intermediate demand. The rate of water supply has been taken as 135 lpcd for 100% population.

3. Design of Water supply components

112. Technical design of the water supply components (i) Clear water reservoir; (iii) raw water and clear water transmissions mains (iii) overhead tanks, and (iv) distribution network, connections, flow meters, etc., follows the relevant national planning and design guidelines, focusing on providing a robust system which is easy to operate, sustainable, efficient and economically viable. Besides, the project also included the following environmental considerations:

- (i) Discontinuation of current unsustainable surface water (Lodeshwar dam) and groundwater wells and keeping only sustainable wells and creating a new comprehensive water supply system based on a nearest surface water sources. Ground water only in case of repair and maintenance of surface water infrastructure and lean season of water
- (ii) To the maximum extent possible nearest surface water source is adopted.
- (iii) Appropriate location of intake to ensure water availability throughout the year
- (iv) Recovering backwash water from treatment process.
- (v) Treatment and disposal management of sludge from treatment process.
- (vi) Minimizing water losses from pipelines by perfect jointing and alignments

⁶ As per CPHEEO, pumps, motors, STP, storage reservoirs are to be designed for a life of 15 years.

- (vii) using appropriate techniques (HDPE pipes up to 150 mm dia joined by electro fusion couplers using on-site electro fusion welding, and all higher dia pipes by on site butt welding)
- (viii) Designing the entire system to maintain optimal flow and terminal pressure, and optimising the overall energy usage
- (ix) Reducing the incidence of water borne diseases by providing 100% population including urban poor with potable water supplies
- (x) Improve water use efficiency and reduce water wastage at household level by recording and monitoring the water usage, and charging the consumers as per usage; due consideration to urban poor
- (xi) Minimize unaccounted for water (UFW) losses using district metered area approach with flow meter and pressure logging arrangements to identify and rectify the leaks, and unauthorized connections
- (xii) Using low-noise and energy efficient pumping systems

4. Selection of water source

113. Source for water: Presently source of Sagwara town is ground water and surface water from Lodeshwar dam. Lodeshwar dam being not a sustainable source for water supply for Sagwara town. No new source will be developed for the town, an existing Baneshwar anicut on Mahi river is proposed as new source for water supply for the town. A central government sponsored project "Water supply project for 212 villages (Sabla and Sagwara Block) of district Dungarpur from Baneshwar Anicut" under Jal Jeevan Mission is proposed. Under this project WTP 34.7 MLD and 450 mm DI Rising Main Pipeline of about 29 km dia up to Gas Godam CWR will be constructed and will be executed by Public Health and Works Department (PHED) Sagwara. The treated water will be available at Gas Godam CWR for Sagwara.

114. An alternative source analysis has been conducted to select a feasible and sustainable source of water supply to meet the ultimate design demand of Sagwara town. Three alternatives: (i) Ground water; (ii) Lodeshwar Dam; (iii) Beneshwar Anicut were studied, and **Beneshwar Anicut** has been selected based on the techno-economic and environment considerations as elucidated below.

- (i) **Ground Water Source:** Presently Sagwara water supply is benefited from 6 nos. of tube wells at various locations in the city. These tube wells feed water directly into the water supply system. But, Presently Total water abstracted from Tube Wells is negligible, hence ground water sources are not sustainable for future water requirement.
- (ii) **Lodeshwar Dam:** Lodeshwar Dam is 14.6 km. from the town and it meets to Moran River. Presently source of Water at Sagwara town is surface water from Lodeshwar dam with production of 4.46 MLD for urban town which is not enough for the project. So this dam is not taken as source for the proposed system.
- (iii) **Beneshwar Anicut:** Beneshwar Anicut which is about 29 Km from Sagwara town. The Anicut situated about 3 Km from tehsil head quarter Sabla. Salient features of the anicut are as follow: -

115. Beneshwar anicut was constructed across river Mahi in downstream of Beneshwar Dham by M/S Sadguru foundation, Dahod (NGO) under Tribal Area Development (TDA) sanction. The construction was completed in 2007. Currently its owned by water resource department of Rajasthan Government. Mainly it is used to irrigation and drinking water purposed.

Details of Anicut

FTL	104 m
HFL	113.9
Sill R.L	102.5
Foundation R.L	94.6
Bed of River	96.75
No. of opening	79 openings at different elevation
Size of Piers	1.5 X1.5
Size of MS gates	1.8 X1.7
Length of Check dam	387m
Length of crest	328 m
Top width of anicut	1.50 m
Height of check dam	7.50 m

116. **Location** - The Anicut situated about 3 km from tehsil head quarter Sabla. The latitude and longitude are 23°47'40.58" and 74°10'24" respectively. The site is approachable by a tar road from Aspur-Banswara road from Sabla and about 60 km from district head quarter Dungarpur.

117. **Catchment Area** - As per available records with WRD gross catchment area is about 15988 sq km and general bed slope is 1:720. The peak flood discharge worked out to 13,93,311.85 cusecs. Combined discharge of Mahi, Som and Jakham passes through this Anicut. Major dams i.e. Mahi Bajaj Sagar Dam, Som Kamla Amba Dam and Jakham Dam are in upstream of Anicut.

118. **Selection of Site** - The site was selected looking at holy place Beneshwar Dham. It was constructed to facilitate pilgrims who came here for their rituals. Anicut storage water also provide irrigation facilitate of both banks of the river. Submergence area is within limits of the river banks.

119. **Climate** - The site is situated in sub-tropical, sub humid to humid climate conditions characterized by mild winter and moderate summers with high relative humidity during the month of July to September. The area experience mean monthly minimum temperature ranging from 11°C (January) to 26°C (June) and mean monthly maximum temperature ranges from 21.8°C (January) to 43.8°C (May) with some times goes up to 46°C.

120. **Rainfall** - The catchment area is too big i.e. 15,988 sq.km. spreading across Rajasthan and Madhya Pradesh and there are number of rain gauge stations in the catchment area. The nearest rain gauge station is at Sabla and annual rainfall is 750 mm. Average means annual rainfall for Sagwara town for last 50 years amount to 745.65 mm/yr. On an average monsoon rainfall (months June to September) amounts to 95% of total annual rainfall for the same period. The same is shown in Appendix 6

121. **Runoff** - Peak flood discharge considered is 13,93,311.85 Cusecs (worked out from Dicken's Formula). A river gauging site (G&D site) of C.W.C. located at about 15 km in downstream at Padardi-Badi location. Gauge discharge data for more than 30 rears are available for Mahi.

122. **Submergence** - The storage capacity of Anicut is 310 Mcft and submergence is within the limit of the river boundaries.

123. As there is no other reliable source in the vicinity of town. Given the dependability, sustainability and government permissions, the Beneshwar Anicut is selected as water source for Sagwara town water supply scheme. It has sufficient amount of storage capacity of water to serve

the people of Sagwara Nagar Palika up to ultimate year 2055.

124. Water allocation - the PHED has allocated 10.14 MLD water for Sagwara town water supply sub project and only allocated water will be used for water supply.

125. **Water sustainability and environmental considerations.** The storage capacity of Beneshwar Anicut is 310 Mcft, while the water requirement of ultimate year (2055) for the project is 7.96 MLD or 2.91 MCM or 102.6 Mcft per year, which is about 33% of storage capacity of Beneshwar Anicut, which is adequate to meet the project yearly demand of the design year. Storage capacity is 3 times more than the annual water demand of Sagwara town. Also, during the dry summer months, the amount of water drawn would be miniscule compared to the water storage available. It is evident that the Anicut is full to its crest level at the end of monsoon season (September), which gradually reduced to its minimum in summer and up to the arrival of monsoon flows in June-July

5. Sewerage System

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

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

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

128. **Design of Sewage Treatment Plant.** STP of 3.6 MLD capacity is proposed to be constructed at the identified site to treat the sewage generated from Sagwara Town. It is proposed to establish STP based on SBR (sequential batch reactor) process, followed by disinfection by chlorine with Co-treatment of the fecal sludge. As the bid is DBO type, detailed design of the STP will be carried out by the contractor to the following specific discharge standards. Currently for STPs in India, the standards notified by Ministry of Environment, Forests and Climate Change (MOEFCC) in 2017 (see column 4 in table below) are applicable. However, under RSTDSP, PMU has decided to base the STP design on discharge standards for STPs suggested by the National Green Tribunal (NGT) in one of its orders directed MOEFCC in April 2019, which are more stringent. The stringent standards also facilitate maximum utilization of treated wastewater for

reuse in various purposes following the Sewerage and Wastewater Policy, 2016 of Rajasthan.⁷

129. As per site selection criteria framed in EARF, STP site is selected with no habitation within 100 m from proposed STP site. The nearest built-up structures are Maruti service station & Central Jail/BSNL Exchange located about 150 to 250 m away from the proposed STP site. The selected STP site is in government owned site in low line area in downward side of natural slope of town making it most feasible site for STP. The selected site is also had sufficient area for future expansion of the STP, area available 6472 sqm against 3600 sqm required. No other suitable government land is available in is that area for construction of STP.

Table 16: Proposed Raw and Treated Wastewater Characteristics for STP Design

S. No	Parameter	Proposed Discharge Standards for Sagwara STPs	MOEFCC STP Discharge Standards, 2017	CPCB discharge standards, 2015	IFC Guideline value for sewage discharge	WHO Guideline Value for safe use in agriculture
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	pH	6.5 – 9.0	6 – 9	6.0-9.0	6 – 9	6 – 9
2	BOD ₅ , mg/l	≤10	<30	≤10	30	-
3	COD, mg/l	≤50		≤50	125	-
4	TSS, mg/l	≤20	<100	≤10	50	-
5	NH ₄ -N, mg/l	<25	-	≤5	-	
6	Total nitrogen, mg/l	<10	-	≤10	10	-
7	Oil & grease, mg/l	-	-	-	10	-
8	Total phosphorus, mg/l	-	-	-	2	-
9	Fecal Coliform, MPN/100 ml	<1000	<1000	≤100	-	<1,000
10	Nematodes, number of eggs per litre	-	-	-	-	1

BOD = Biochemical Oxygen Demand; COD = Chemical Oxygen Demand; CPCB = Central Pollution Control Board; IFC = International Finance Corporation, the World Bank Group; TSS = Total Suspended Solids.

130. **Treated wastewater Reuse/disposal.** Rajasthan is a water scarce region and receives low rainfall. Recognizing the importance of treated wastewater in reducing the demand on water, Sewerage and Wastewater Policy, 2016, of Rajasthan promotes the reuse of treated sewage for non-potable applications, and also to make sewerage projects environmentally sustainable. Government of Rajasthan adopted this policy to ensure “improved health status of urban population, specially the poor and under privileged, through the provision of sustainable sanitation services and protection of environment”. To further promote the reuse and provide guidance, Policy prioritized reuse in irrigation (agriculture, forestry, and landscaping), followed by fish

⁷ “The use of treated wastewater in irrigation and industrial application shall be given the highest priority and shall be pursued with care. Effluent quality standards shall be defined based on the best attainable treatment technologies, and calibrated to support or improve ambient receiving conditions, and to meet public health standards for end users”.

farming, industry and non-potable domestic reuse. Policy requires monitoring of treated wastewater quality, soil quality etc. Policy prohibits artificial recharge of aquifers using treated wastewater and promotes construction of storage tanks to store treated wastewater to facilitate reuse. Policy prescribes that the detailed project report (DPR) should clearly define the best reuse option specific to the town and prepare a Reuse Action Plan part of the DPR following water quality norms and legal implications. LSGD is currently in the process of publishing Guidelines for Reuse of Treated Wastewater in Rajasthan 2019 to promote the reuse and provide guidance to the stakeholders. Guidelines promotes the use the treated wastewater and envisages to maximize the collection and treatment of sewage generated and reuse of treated wastewater on a sustainable basis, thereby reducing dependency on freshwater resources.

131. Policy provided priority to reuse in agricultural for unrestricted irrigation. It suggests blending of treated wastewater with fresh water to improve quality where possible, and crops to be irrigated shall be selected to suit the irrigation water, soil type and chemistry. Policy requires monitoring of accumulation of heavy metals and salinity. It encourages farmers to use modern and efficient irrigation technologies, and to ensure protection of on-farm workers and crops. As a contingency measure, policy requires regular monitoring of treated water quality, and emergency alerts to users in any event of deterioration of quality. Policy prohibits use of treated wastewater for artificial recharge (excerpts from Policy on Reuse is provided in **Appendix C-9**).

132. **Reuse Options.** Following the Sewerage and Wastewater Policy, 2016, the draft Guidelines on Reuse provides the following reuse applications:

- (i) Agriculture, horticulture, irrigation;
- (ii) Gardening in park;
- (iii) Road washing and water sprinkling to reduce fugitive dust;
- (iv) Industries including mining;
- (v) Recreational ponds and lakes;
- (vi) Social forestry;
- (vii) Construction activities;
- (viii) Firefighting and other municipal uses;
- (ix) Railway;
- (x) Thermal power plants;
- (xi) Cantonments; and
- (xii) Individual users.

133. **Allocation of treated wastewater for reuse.** City Level Committee (CLC) headed by the district collector will allocate the water for most appropriate uses. According to the proposed procedure, agencies/individuals that require treated wastewater shall apply to the district collector. CLC will allocate water to users. In case of supply is more than the demand of the town, the treated wastewater can be allocated to users within 25 km of STP by the CLC. It may also be made mandatory to industries to use treated wastewater under certain conditions. Memorandum of understanding between ULB and the users of the treated water.

134. **Reuse Plan.** The State Policy requires the sewerage detailed project report provide reuse options and strategy to implement reuses, and detailed reuse action plan. As the Sagwara subproject is proposed under DBO, the reuse plan will be prepared by the DBO contractor during the detailed design phase in consultation with the stakeholders in Sagwara, and reuse modalities will be firmed up. Following needs to be considered in the preparation of reuse plan:

- (i) As part of the plan, identify potential reuse application in Sagwara , and establish quality criteria for each of the use;

- (ii) For applications that use treated wastewater directly (e.g. agriculture), the quality required for such application in safe manner considering health, environment and crop yield concerns shall be ensured;
- (iii) Prepare a reuse plan for agriculture, if that is the priority use or one of the applications as per the CLC in Sagwara, clearly indicating the limits (geographical/crops/type of application/type of soils etc.); adopt international good practice suggested by agencies like World Health Organization (WHO), Food and Agricultural Organization (FAO) of the United Nations;
- (iv) Plan should include awareness and training provisions and responsibilities; these can be conducted by concerned department (e.g., Agricultural Department, District Collectorate); and
- (v) Carryout regular/online monitoring of critical quality parameters of treated wastewater to ensure that they meet the present standards established for reuse.

135. Use of treated wastewater for irrigation. Use of wastewater for irrigation is associated with some health risks – from germs in wastewater, which may contaminate food and spread disease, health risk to farm workers from worms (helminths) and nematodes and chemical risk is associated if industrial wastewater enter the sewers. If the wastewater with bacteriological contaminants are used for salad crops like lettuce, tomato, which are eaten without peeling or cooking, it will present a greater health risk if precaution such as such washing with chlorinated water or storing for adequate time in normal temperature before use (at least 10 days). According to the WHO, effluent which is used to irrigate trees, industrial/commercial (not food, like cotton) and fodder crops, fruit trees, and pasture should have less than one viable nematode egg per liter. Effluent used for the irrigation of food crops, sports fields, public parks, should have and less than one viable nematode egg per liter and less than 1,000 fecal coliforms per 100 millilitres (ml). These shall be considered in the reuse plan that will be prepared during the detailed design and complied accordingly.

136. Disposal of treated wastewater. As the wastewater shall be treated to stringent disposal standards, no notable impacts envisaged. The disposal of treated wastewater meeting the set quality standards, in fact, will improve the quality of water by dilution. Proper systems should be put in place at the proposed STP to ensure that treated wastewater at all times meet the stipulated standards prior to its disposal into river. Baseline water quality monitoring of the discharge point should be conducted during the detailed design phase (monsoon flow). Treated effluent will be discharged into a monsoon season drain which is adjoining to the proposed location of STP and its having approximate distance of 20 meter. The discharge point for treated effluent of STP is a natural depression located near STP site owned by ULB, from here it shall be reused by nearby farmers and over flow from this depression will reach to natural stream on down stream of town. In the surrounding of proposed STP location. There is vast area of agricultural fields is present and more than 150 ha land is available for reuse the treated effluent for irrigation purpose. During the non- irrigation period treated effluent will be discharge in the drain which is present near the proposed STP location.

137. Any change/lowering of treatment efficiency during operation may lead to poor quality of wastewater and may further pollute the water body. It is therefore critical that STP treats the sewage as designed. O&M of STP and change in incoming sewage quality will have impact on the treatment efficiency. This therefore requires to:

- (i) Obtain of consent of RSPCB for discharge of treated wastewater into water body;
- (ii) Conduct a baseline water quality assessment of receiving water body;
- (iii) Regularly monitor the treated wastewater quality at STP and ensure that it meets the discharge standards; and

- (iv) Monitor water quality periodically during operation phase as per the EMP.

138. **Sludge treatment and disposal.** Sewage sludge generally consists of organic matter, pathogens, metals and micro pollutants. The concentration of parameters such as metals can be influenced by input to the sewers system from industry. Since no industrial wastewater is allowed into sewers, it is unlikely that sludge contains heavy metals. Heavy metal concentration may not be ruled out completely as the chemicals used in treatment may potentially contain heavy metals, which will then leach into the sludge. Sludge thickener with mechanical dewatering system after that sludge will go to sludge drying beds from where after drying sludge may used for construction material in form of bricks, blocks etc. or as a manure as decided by Local body. SBR Process is aerobic treatment therefore, there will be negligible odor.

139. Subproject includes sludge management infrastructure in STP, including system for sludge collection, thickening, solar drying, and disposal at landfill/identified site. This includes a sludge sump to collect sludge from SBR basins; returning arrangement for supernatant from the sump to inlet/equalization tank for treatment; pumping sludge to sludge thickener and pumping thickened to mechanical sludge dewatering system (such as centrifuge). It also requires contractor to establish a shed where the dewatered sludge cake can be further air dried for 15 days. This is indicative sludge management system, and DBO contractor will design the system meeting these requirements. Bid indicates that “the sludge produced from the treatment process would be processed so it may be used as fertilizer and soil conditioner” and it requires DBO contractor “to conform to the regulations of public health and environment protection norms”. This follows the Sewerage and Wastewater Policy, 2016, which suggests “use of sludge produced from the treatment as fertilizer and soil conditioner after processing”. Other solid waste materials from sludge treatment should be covered by an environmentally compliant disposal management plan. Disposal to vacant lot (even if government land) should not be allowed.

140. The treatment and drying processes kill enteric bacteria and pathogens, and because of its high content of nitrates, phosphates and other plant nutrients the sludge is an excellent organic fertilizer for application to the land. Adequate drying is however necessary to ensure maximum kill of enteric bacteria. To achieve adequate drying minimum drying period (15 days) shall be ensured. The drying period, which will be varying depending on the season will be determined during operation and be followed. A sludge management plan will be developed by the DBO contractor during the detailed design phase. Proper sludge handling methods should be employed. Personal protection equipment should be provided to the workers.

141. Contractor will propose the sludge management plan with best methods for reuse of sludge as per guidelines of CPHEEO (guidelines are attached as **Appendix C-10**) and best international practices in consultation with PMU and Municipal Council. Properly dried sludge can be used as soil conditioner. Periodic testing of dried sludge will be conducted to ensure that it does not contain heavy metals that make it unsuitable for food crops. Tests shall be conducted to confirm the concentrations below the following standards. As there are no specific standards notified for sludge reuse, the compost quality standards notified under the Solid Waste Management Rules, 2016 have been adopted here. Rules stipulate that “In order to ensure safe application of compost, the following specifications for compost quality shall be met”.

Table 17: Standards for Sludge Reuse as Manure

Standards for Composting. As there are no specific standards notified for sludge reuse, the compost quality standards notified under the Solid Waste Management Rules, 2016 (Schedule II A, Standards for Composting) have been adopted here. According to the standards “In order to ensure safe application of compost, the following specifications for compost quality shall be met, namely:			
Parameters	Units	Organic Compost (FCO 2009)	Phosphate Rich Organic Manure (FCO 2013)
Arsenic	mg/kg	10	10
Cadmium	mg/kg	5	5
Chromium	mg/kg	50	50
Copper	mg/kg	300	300
Lead	mg/kg	100	100
Mercury	mg/kg	0.15	0.15
Nickel	mg/kg	50	50
Zinc	mg/kg	1000	1000
C/N ratio	-	<20	<20:1
pH	-	6.5 – 7.5	(1:5 solution) maximum 6.7
Moisture, percent by weight, maximum		15.0 – 25.0	25.0
Bulk density	g/cm ³	<1	Less than 1.6
Total Organic Carbon, per cent by weight, minimum	percent by weight	12	7.9
Total Nitrogen (as N), per cent by weight, minimum	percent by weight	0.8	0.4
Total Phosphate (as P ₂ O ₅) percent by weight, minimum	percent by weight	0.4	10.4
Total Potassium (as K ₂ O), percent by weight, minimum	percent by weight	0.4	-
Colour			
Odor		Absence of foul Odor	
Particle size		minimum 90% material should pass through 4.0 mm is sieve	minimum 90% material should pass through 4.0 mm is sieve
Conductivity, not more than	dsm-1	4	8.2
* compost (final product) exceeding the above stated concentration limits shall not be used for food crops. however, it may be utilized for purposes other than growing food crops. FCO = Fertilizer Control Order, Department of Agriculture, Government of India			

142. In order to ensure the safe use of dried sludge, following should be followed:

- (i) Prepare a dried Sludge utilization plan for Sagwara within the help of Agriculture Department/CLC; plan should also include if any additional processing is required for sludge to use as soil conditioner;
- (ii) Plan should clearly include various potential uses and demand in town and surroundings;
- (iii) Establish usage limits, where required, (geographical/crops/type of application /type of soils etc.); adopt international good practice suggested by agencies like

World Health Organization (WHO), Food and Agricultural Organization (FAO) of the United Nations;

- (iv) Identify a landfill/suitable site for disposal of surplus dried sludge;
- (v) Monitor sludge quality during operation phase as per the EMP, ensure that it meets the quality parameters established by FCO; and
- (vi) In case of sludge not meeting the quality parameters, it shall not be used as soil condition, and shall be disposed at appropriate disposal site (if it falls under hazardous category, it shall be disposed as per the Hazardous Waste Management Rules, 2016).

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

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

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

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

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

- (i) Limit the sewer depth where possible
- (ii) Sewers shall be laid away from water supply lines and drains (at least 1 m, wherever possible);

- (iii) In all cases, the sewer line should be laid deeper than the water pipeline (the difference between top of the sewer and bottom of water pipeline should be at least 300 mm)
- (iv) If unavoidable, where sewers are to be laid close to storm water drains, appropriate pipe material shall be selected (stoneware pipes shall be avoided)
- (v) For shallower sewers and especially in narrow roads, use small inspection chambers in lieu of manholes;
- (vi) Design manhole covers to withstand anticipated loads & ensure that the covers can be readily replace if broken to minimize silt/garbage entry
- (vii) Ensure sufficient hydraulic capacity to accommodate peak flows & adequate slope in gravity mains to prevent build up of solids and hydrogen sulfide generation
- (viii) Take necessary precautionary measures to protect sewer network, and to avoid disposal of solid wastes, debris, wastewater into newly laid sewers from the time it is constructed to the start of operation phase.

147. **Fecal Sludge and Septage Management.** The proposed FSSM will help the ULB to cover entire population with safe disposal of human excreta by serving areas which are not feasible to be provided with a sewerage system. Sagwara town is having 45 municipal wards. Out of 45, 19 wards have taken in FSSM. Full / Partial area of these wards which have scattered habitation at present taken in FSSM. For safe disposal of waste water generation from these pockets of wards FSSM has been proposed. Under the FSSM, fecal sludge/septage will be collected from the household level septic tanks using truck mounted mobile desludging equipment and transported to STP for treatment. At this stage, the quantity of septage generated from this area is not available. This will be estimated during the detailed design phase, and number of mobile tankers required to collect the transport the septage to STP, frequency of collection depending on the size of septic tanks etc., will be worked out accordingly. Although handling, transportation and disposal into STP is completely mechanized, the system will however be operated by the workers, therefore proper precautions as workers will be dealing with highly harmful septage. Accessibility of septic tanks to mobile suction tankers to collect septage is critical for success of the septage management system. At STP, the septage will be mixed with the sewage and will be treated combined in the STP. Septage will be in concentrated and partially degraded form, and disposal of the same into STP inlet stream may upset the sewage treatment process, may generate bad odors, and may ultimately affect the quality of treated wastewater. Treatment process needs to be properly designed. Following measures are suggested for implementation:

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

- hazards;
- (vii) Ensure proper facilities for workers including showers, wash areas, toilets, drinking water, eating and resting places;
- (viii) Conduct regular health checks; and
- (ix) Prepare health and safety plan for FSSM.

6. Associated Project with Water Supply

148. **Associated projects** - Presently source of Water for Sagwara town is surface water from Lodeshwar Dam. The town is also benefited from 6 no. of tube wells at various locations in the city. These are connected to Clear Water Reservoir (CWR) at various locations in the city & from there by pumping water is transferred to related Overhead service reservoir. Total water abstracted from Tube Wells is 0.14 MLD and from Lodeshwar dam is 4.46 MLD. With the future demand of Sagwara town Lodeshwar dam is not found sustainable source for Sagwara town.

149. A central government sponsored project "Water supply project for 212 villages (Sabla and Sagwara Block) of district Dungarpur from Baneshwar Anicut" under Jal Jivan Mission is proposed. Under this project the Baneshwar anicut is considered as sustainable source of water and provision of 10.14 MLD water to fulfil the water requirement of Urban water project is included and it will be provided upto Proposed Clear Water Reservoir, Sagwara Gas Godam through RSTDIP.

150. Capacity of WTP proposed at Beneshwar Anicut is 34.70 MLD. This WTP will be constructed by PHED. Sludge management will be as per convention WTPs (Sludge thickener, sludge drying beds and storage etc. generally dried sludge from sludge drying beds may be used in brick making, ceramic making, cementitious materials as substitute for building material.) DPR is approved by PHED, and Administrative and Financial Sanction is issued, the of copy of approval of DPR along with it components is attached at Appendix 8. No EMP was prepared for the project and CTE/ CTO, forest clearance and other permission will be applied after award of work. PHED is estimating to complete the work by end of 2024.

C. Environmental Audit of Existing Water Supply Infrastructure

151. It is designed to utilize existing water supply infrastructure like tube wells, clear water reservoirs, pump houses etc. with necessary improvements. As per the ADB SPS 2009, these are associated facilities and therefore the component operation shall comply with the ADB and applicable environmental laws of India. Besides, ADB SPS lays emphasis on impacts and risks on biodiversity and natural resources, pollution prevention abatement including hazardous waste, occupational health and safety, community health and safety, and physical cultural resources. A random environmental audit is conducted to (i) assess the compliance of the existing infrastructure with environmental legislations and (ii) improve environmental performance to minimize future potential liabilities. A more detailed environmental audit and risk assessment shall be carried out during detailed design stage and incorporated into the final IEE.

152. All the existing infrastructure facilities are located in Sagwara town, which is an urban area and where there are no protected or sensitive environmental areas such as forests, wildlife sanctuaries or archeologically protected areas. Therefore, there are no risks or impacts on biodiversity and natural resources. The designed project will optimally utilize the surface and groundwater sources. Due to nature of components, the existing infrastructure components do not fall under the ambit of any environmental related regulations, and therefore there is no requirement of permissions or clearances. Presence of Asbestos Containing Material (ACM) in

the form of asbestos cement pipes in the existing water supply infrastructure is a cause of concern due to its potentially hazardous nature. Project, however, do not include rehabilitation or repair of AC pipes, and the project, in fact, designed to discontinue the use of AC pipes. Presence of AC pipes in the existing facilities may create hazardous conditions for the workers and surrounding community. Besides, the generation and disposal of debris and discarded materials, and construction phase health and safety need to be considered and mitigated to comply with the SPS provisions. Following table 18 provides component wise compliances and concerns. Corrective actions for the identified environmental concerns are discussed in the following section.

Table 18: Environmental Audit of Existing Facilities

Infrastructure	Details	Designed Rehabilitation	Compliance with environmental regulatory framework	Environmental Concerns
6 Tube wells	TW-1; Gowadi TW-2 ; Near Spring Deals Sr. Secondary School. TW-3; Near Workers colony TW-4; Gamathwara TW-5; Govt.School Hariom Colony TW-6; Near Bhoiwara	Replacement of pipes, submersible pumps, cables, panels, valves, flow meters Depth of the tube wells will not be increased	No requirements under existing laws	NA
3 Clear water reservoirs (CWRs)	• 2 nos. of CWR at Main Pump House HW (337 KL + 202 KL) • CWR at Punarwas Colony HW (337 KL)	Civil repairs and rehabilitation, replacement of pipes, connections, electrical and mechanicals parts as required Cleaning	No requirements under existing laws	Storage of AC pipes in existing campus Occupational health and safety, public safety during the construction works Disposal of discarded material, debris including AC pipes
7 OHSRs and GLSRs	• Nasiya Ji Campus (OHSR) • Suwaron Ka Dungara (GLSR) • Sindhi Colony (OHSR) • Hospital Colony (OHSR) • Gamathwara Tabiyad basti (OHSR) • Indra Colony (GLSR) • Punarwas Colony (OHSR)	Civil repairs and rehabilitation, replacement of pipes, connections, electrical and mechanicals parts as required Cleaning	No requirements under existing laws	Presence of AC pipes in existing connections Occupational health and safety, public safety during the construction works Disposal of discarded material, debris including AC pipes

Infrastructure	Details	Designed Rehabilitation	Compliance with environmental regulatory framework	Environmental Concerns
2 Pumping stations	• Main Pump House Campus • Punarwas Colony Campus	All New pump are proposed and old will be phased out.	No requirements under existing laws	Presence of AC pipes in existing connections Spillage of oils, lubricants etc., Occupational health and safety, public safety during the construction works Disposal of discarded material, waste oils, mechanical and electrical parts, debris including AC pipes
Transmission and distribution	The existing distribution system with AC (56.08 Km), CI (10.67 Km) HDPE (3.58 Km) and DI (2.29 Km) pipes are very old with heavy leakages due to breakages and joints leakages due to ageing and hence need to be phased out except some newly laid HDPE Lines.	All AC, CI pipes will be replaced by new distribution lines	No requirements under existing laws	Exact location and condition of AC pipes not known; no maps available. Accidental disturbance / need to remove in narrow roads Occupational health and safety, public safety during trenching

153. **Corrective Measures.** As presented in the above table, there are no regulatory non-compliance issues in the existing infrastructure. The environmental concerns are mainly related to occupational health and safety, public safety, disposal of debris, discarded materials etc., A work specific environmental management plan needs to be prepared for these aspects. The exact nature of rehabilitation and repair works will be known only during the detailed design phase as the detailed technical audit will be conducted by the DBO contractor and the required rehabilitation and repair measures will be designed accordingly. Therefore, a separate EMP will be prepared for rehabilitation works during the detailed design phase by the DBO contractor, and reviewed and approved by PMU/consultants, and the same will be implemented by the DBO contractor. These are included in the EMP.

154. **Asbestos Containing Materials (ACM) Management.** Presence of ACM, mainly asbestos cement pipes, in the existing infrastructure is the main concern. Asbestos is recognized as a cause of various diseases and is considered health hazard if inhaled.

155. Existing water distribution network is mostly asbestos cement (AC) pipes. Total 56.083 km pipelines are laid with asbestos containing material. Details of existing AC pipes are given

below:

Table 19: Details of AC Pipes in Existing distribution networks

S. No.	Diameter (mm)	Material	Length (m)
1	80	AC	33582
2	100	AC	7149
3	125	AC	435
4	150	AC	12581
5	200	AC	2336
			56083

156. There is requirement of placing new pipe lines in place of old AC pipes, the existing AC pipes shall be made abandoned and left in situ and new pipe lines shall be laid parallel to it, therefore it will not attract specific mitigation measures for demolition, handling, transportation and disposal. old Asbestos Cement (AC) & CI pipelines except newly laid High-Density Polyethylene (HDPE) and DI pipe lines will be replaced by the new water mains of different sizes of HDPE and DI K-7 pipes of size 75mm to 315mm dia. Assessment of quantity of replacement of AC pipes is required before start of construction works. All Ductile Iron (DI) pipelines shall be considered in rocky area of Town under this proposal. There will be no use of any asbestos cement pipe in the future as under the present project, water supply network is being provided in the entire town with non-asbestos cement pipes. It is normal practice in Rajasthan that existing asbestos cement pipes are left as it is in the ground and new pipes will be laid in a new alignment.

157. However, complete avoidance of handling and disposal of asbestos cement pipes may not be possible. There are narrow lanes, where asbestos cement pipes may be encountered during the laying of new pipes. These will be removed and replaced with new non-asbestos cement pipes. At present no maps available on the exact location/position of asbestos cement pipes.

158. A temporary storage area shall be provided in the project site by the PIU. Asbestos materials present and removed from the construction activities will be temporarily maintained at the identified area. The temporary storage area shall be constructed by the DBO contractor based on the specifications of the asbestos management service contractor.

159. Bureau of Indian Standards (BIS) Guidelines for Safe Use of Products containing asbestos states that "asbestos cement products (such as asbestos cement pipes) generally contain about 10-15% asbestos fibres 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 fibres bound in cement. There is very little possibility of generation of airborne asbestos fibres during any reasonable handling, storage, and use of such products. However, during storing and installation, recommended work practices shall be followed to avoid harmful exposure". According to Hazardous and other Wastes (Management and Transboundary Movement) Rules, 2016, any waste having asbestos concentration limit of 10,000 mg/kg (i.e., 1%), however this will apply only if the asbestos containing substances are in a friable, powdered or finely divided state. Under the Basel Convention,⁸ asbestos or asbestos waste in the form of dust and fibres is classified as hazardous waste.

160. Working with or handling asbestos cement pipes in manner that produces dust, fibres, air borne particles etc., is very harmful and hazardous to the workers and general public around the

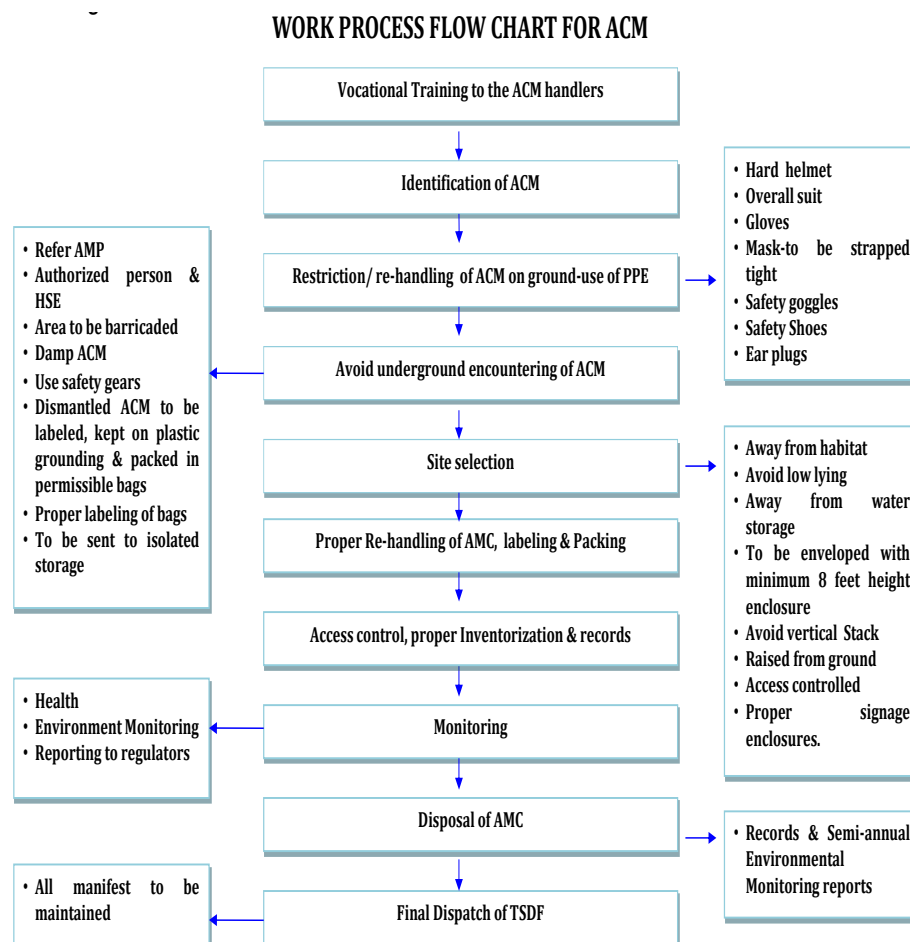
⁸ Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, adopted in 1989.

work sites. The condition of existing underground asbestos cement pipes is not known, however, as these are old, pipes may be in deteriorated conditions. Condition needs to be assessed to check whether it is in friable form or in a condition in which it can release fibres before it is subjected any disturbance or removal.

161. As per above discussions, it is therefore obvious that specific measures are necessary to safeguard the health and safety of the project workers and nearby communities; consistent with the requirements of the ADB SPS, 2009. Activities such as clearing, transfer and disposal of asbestos cement pipes, work in narrow streets, and interventions in existing asbestos cement pipes may have adverse impacts on workers and surrounding population. Air borne asbestos if handled unsafely, cut, drilled or broken into pieces that may cause health issues such as Inflammation of the lungs, mesothelioma, peritoneal mesothelioma, pleural plaques, asbestosis and bronchogenic carcinoma. This should be based on the approach recommended by ADB for "protecting workplaces and communities from asbestos exposure risks (Good Practice Guidance for the Management and Control of Asbestos: Protecting Workplaces and Communities from Asbestos Exposure Risks⁹ (March 2022)), United States Environmental Protection Agency (USEPA), Following measures are to be implemented to avoid any impacts:

- (i) Develop and implement the ACM Management Plan (AMP) that includes identification of hazards, the use of proper safety gear and disposal methods. Sample AMP is provided in **Appendix C-20**. Adhere to the workflow process suggested in Figure 21;
- (ii) Conduct awareness program on safety during the construction work;
- (iii) Undertake the construction work stretch-wise; excavation, pipe laying and trench refilling should be completed on the same day;
- (iv) Provide barricades, and deploy security personnel to ensure safe movement of people and also to prevent unnecessary entry and to avoid accidental fall into open trenches;
- (v) Identify risk of intervention with existing asbestos cement pipes. If there is significant risk, implement the AMP strictly that includes identification of hazards, the use of proper safety gear and disposal methods;
- (vi) Appropriate actions as defined in the AMP will have to be adhered to; and
- (vii) Maintain records of asbestos cement pipes as per the AMP.

⁹ <https://www.adb.org/publications/good-practice-management-control-asbestos>

Figure 21: ACM Management Plan – Work Process Flow Chart

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

- (v) engaging certified and competent asbestos service provider to identify, handle and remove the asbestos materials present and encountered in the project sites;
- (vi) adopting good practices per EHS Guidelines¹⁰ to minimize the health risks associated with asbestos materials by avoiding their use in new construction and renovation, and, if installed asbestos-containing materials are encountered, by using internationally recognized standards and best practices to mitigate their impact;¹¹

¹⁰ ADB SPS specifies application of pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's *Environment, Health and Safety (EHS) Guidelines*. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When host country regulations differ from these levels and measures, the borrower/client will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the borrower/client will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in this document.

¹¹ The EHS Guidelines specify that the use of ACM should be avoided in new buildings and construction or as a new

- (vii) training of workers and supervisors, possession of (or means of access to) adequate equipment and supplies for the scope of envisioned works, and a record of compliance with regulations on previous work;
- (viii) removal, repair, and disposal of ACM shall be carried out in a way that minimizes worker and community asbestos exposure, and require the selected contractor to develop and submit a plan, subject to the PMU and PIU's acceptance, before doing so;
- (ix) providing adequate protection to its personnel handling asbestos, including respirators and disposable clothing; and
- (x) notifying the Rajasthan State Pollution Control Board (RSPCB) of the removal and disposal according to applicable regulations as indicated in the technical requirements and cooperating fully with representatives of RSPCB during all inspections and inquiries.

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

1. Pre-construction Impacts

164. **Utilities.** Telephone lines, electric poles and wires, water lines within the proposed project locations may require to be shifted in few cases. To mitigate the adverse impacts due to relocation of the utilities, the contractor, in collaboration with ULB will

- (i) identify the locations and operators of these utilities to prevent unnecessary disruption of services during construction phase; and
- (ii) instruct construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services.

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

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

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

167. **Debris 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 rules¹² during construction and adhering to following criteria (including but not limited to)-

- 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 PIU for approval
- Dispose the construction waste and debris in construction and demolition waste management facility approved by RSPCB; if such facility is not available near the project town, the contractor shall identify disposal site confirming to the criteria, obtain permissions from local body and government agencies as required, and submit for the approval of PIU; disposal sites shall be used only after approval of the PIU
- Sites shall not be located in forest areas, water bodies or drainage lines, swamps or in areas which will inconvenience the community
- The site shall be selected preferably from barren, infertile lands.
- The local governing body and community shall be consulted while selecting the site.
- Debris disposal site shall be at least 200 m away from surface water bodies.
- 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.

2. Construction Impacts

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

169. **Laying of Water Supply and Sewer Networks.** Subproject include linear works (laying of water supply and sewage collection pipes). This covers almost entire project area of Sagwara

¹²Construction and Demolition Waste Management Rules 2016 (refer appendix 8)

Town. Distribution lines/small sewers (tertiary sewers) will be laid in all streets and roads, the larger sewers and water mains will be laid mostly on wider main roads. Pipes/sewers will be laid by open cut method. Water pipes will be laid in the ground with or without a maximum cover of 1 m, so that depth of excavation will be up to 1.5 m-1.8 m. The maximum depth for sewers depends on the design, and in Sagwara most of the sewers will be laid 1.2 m to 3.5 m below the ground, and some sewers will be laid deeper (>2 m) and maximum depth will be 6 m. As per the bid conditions, "the maximum depth of sewer is 3.5 m for open excavation; after 3.5 m sewer shall be laid by the trenchless method only. Trenchless method may also be used even where depth is less than 3.5 m for important roads in the city where traffic density is more, and in the streets where traffic diversion is not feasible etc. Sufficient care will be taken while laying so that existing utilities and cables are not damaged and pipes are not thrown into the trenches or dragged, but carefully laid in the trenches. Trenches deeper than 1.5 m will be protected by shoring/bracings to avoid collapse of trenches, and also to avoid any risk to surrounding buildings. Once they are laid, pipes will be joined as per specification and then tested for any cracks or leakages. The minimum working hours will be 8 hours daily, the total duration of each stage depends on the soil condition and other local features. Extraneous soil after backfilling of trenches shall be used for filling low lying area or stored/ dumped in approved debris disposal sites.

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

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

172. **Demolition works.** In the initial stage of project planning it is accessed that there is no requirement of demolition of structures. If any demolition works are required, proper work plan and Mitigation measures will be required for demolition works. Structures to be demolished should be wetted through water sprinkling to reduce dust emission. Appropriate site for storage and disposal of demolished materials should be selected prior to start of demolition activities with prior permission/approval of PIU/ULB. All the safety measures should be adopted during demolition activities.

173. **Storage and Disposal of excavated earth.** A large quantity of soil will be excavated for pipe laying, construction of CWR, pump house and other. Some part of this excavated soil will be reused for backfilling 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 rules¹³ and shall identify a debris disposal site in consultation with the PIU/ULB and adhering to following criteria:

- (i) 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 PIU for approval
- (ii) Dispose the construction waste and debris in construction and demolition waste management facility approved by RSPCB; if such facility is not available near the project town, the contractor shall identify disposal site confirming to the criteria, obtain permissions from local body and government agencies as required, and submit for the approval of PIU; disposal sites shall be used only after approval of the PIU
- (iii) Sites shall not be located in forest areas, water bodies or drainage lines, swamps or in areas which will inconvenience the community
- (iv) The site shall be selected preferably from barren, infertile lands.
- (v) The local governing body and community shall be consulted while selecting the site.
- (vi) Debris disposal site shall be at least 200 m away from surface water bodies.
- (vii) No residential areas shall be located within 100 m downwind side of the site.
- (viii) The site is minimum 250 m. away from sensitive locations like hospitals, religious places, ponds/lakes or other water bodies.
- (ix) Soil storage site should be properly demarcated by fencing and information board should be placed at entrance
- (x) At soil storage site soil should be covered by tarpaulin or regular water sprinkling should be done to reduce dust emission
- (xi) 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

174. 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:

- (i) Use material sources permitted by government;¹⁴
- (ii) Verify suitability of all material sources and obtain approval of PIU;
- (iii) 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
- (iv) 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

¹³ Construction and Demolition Waste Management Rules 2016 and Solid Waste Management Rules.

¹⁴ CTE and CTO will be required for batching plant, hot mix plant, crushers etc. if specifically established for this project. If contractor is purchasing raw material or ready mix concrete, asphalt/macadam and aggregates from third party, he has to be assured that third party is having CTE/CTO from RSPCB and should collect the copy of these and submit to PIU/consultants. Quarry sites should also have the desired permissions.

175. **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:

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

176. **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:

- (i) Prepare and implement a construction waste / spoils management plan;
- (ii) Avoid constructing any construction camps and labour camps near to any water body and do not allow to dispose any waste or sullage in to any water body
- (iii) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets;
- (iv) Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with PIU on designated disposal areas;
- (v) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies;
- (vi) 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
- (vii) Dispose any wastes generated by construction activities in designated sites;
- (viii) 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
- (ix) Conduct surface water quality Monitoring according to the Environmental Management Plan (EMP)

177. **Noise and Vibration Levels.** Construction works will be conducted along the roads in

Sagwara 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:

- (i) 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;
- (ii) Use road cutters instead of breaker/hammer for cutting the road before excavation for pipe laying on roads
- (iii) Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach;
- (iv) 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;
- (v) DGs being used at site should have sound reducing (acoustic) enclosures, preferably silent DGs should be used at site;
- (vi) 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;
- (vii) Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity;
- (viii) 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.;
- (ix) Provide all workers appropriate PPEs like ear plug/muff, working in high noise conditions;
- (x) Keep all vehicles and equipment in good conditions to avoid excessive noise generation;
- (xi) 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;
- (xii) Avoid noisy works in nights in inhabited areas to avoid any disturbance to habitants; and
- (xiii) Consult in advance with habitants and inform them about the nature and duration of works
- (xiv) Conduct noise monitoring according to the Environmental Management Plan (EMP)

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

- (i) 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.

- (ii) Contractor should plan for night works only after directions from PMU/PIU/CMSC
- (iii) Contractor should submit plan for night works for approval from PIU.
- (iv) 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.
- (v) 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.
- (vi) Contractor is required to have following equipment/arrangements for night works-
- (vii) Contractors should have hand held noise level meter for measurement of noise during night hours
- (viii) Contractors should have hand held lux meter for the measurement of illumination during night hours
- (ix) Preferably electrical connections is available for running equipment otherwise sound proof/super silent Diesel Generator set should be available
- (x) 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

- (xi) Illumination should be as follows-

Minimum illumination (lux)	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

- (xii) 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
- (xiii) All the noise activity like hammering, cutting, crushing, running of heavy equipment should be done in day time and avoided in night time
- (xiv) Workers engaged in night works should have adequate rest/sleep in daytime before start of night works
- (xv) 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
- (xvi) 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

- (xvii) 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
- (xviii) Horns should not be permitted by equipment and vehicles
- (xix) Workers should not shout and create noise
- (xx) First aid and emergency vehicles should be available at site
- (xxi) Emergency preparedness plan should be operative during night works
- (xxii) Old persons and pregnant women and women having small kids should not work in night-time
- (xxiii) All the vehicles and equipment being used at night works should have adequate type of silencers/enclosures/mufflers to reduce noise
- (xxiv) All the vehicles should be checked for working head lamps, tail lamps, inner lights etc. before start of night works
- (xxv) 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
- (xxvi) Night works should be stopped early in the morning at least one hour before start of pedestrian/traffic movement
- (xxvii) After completion of night works all the site should be cleaned and maintained obstruction free for day time movement of vehicles and pedestrians
- (xxviii) Drivers and workers should be alert and responsive during night works
- (xxix) All the wages to workers working in night hours should be as per the applicable labour acts
- (xxx) Avoid any nuisance which may create problems to nearby habitants and work peacefully during night hours
- (xxxi) Night works should not be conducted near hospitals and during peak seasons such as peak tourist season, students' exam times etc.

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

- (i) Store fuel, oils, lubricants etc on impervious and protected areas, ensure spill control kits, and proper containments bunds to ensure no spillage
- (ii) Prepare and implement construction waste / spoils management plan;
- (iii) Avoid stockpiling of excess excavated soils;
- (iv) Coordinate with ULB for beneficial uses of excess excavated soils or immediately dispose to designated areas;
- (v) Recover used oil and lubricants and reuse or remove from the sites;
- (vi) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;
- (vii) Minimize removal of vegetation and disallow cutting of trees;
- (viii) If tree-removal will be required, obtain tree-cutting permit from the Revenue Department; and
- (ix) Plant three native trees for every one that is removed.
- (x) Remove all wreckage, rubbish, or temporary structures which are no longer required; and

- (xi) Request PIU to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.

180. **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:

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

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

- (i) Prepare and implement a Traffic Management Plan (**Appendix C-4**)
- (ii) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;
- (iii) Schedule transport and hauling activities during non-peak hours;
- (iv) Locate entry and exit points in areas where there is low potential for traffic congestion;
- (v) Keep the site free from all unnecessary obstructions;
- (vi) Drive vehicles in a considerate manner;
- (vii) Coordinate with Traffic Police for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided during peak hours; and
- (viii) Notify affected sensitive receptors by providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.

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

- (i) Inform the affected local population 1-week in advance about the work schedule
- (ii) Plan and execute the work in such a way that the period of disturbance/ loss of access is minimum.

- (iii) Provide pedestrian access in all the locations until normalcy is restored. Provide wooden/metal planks over the open trenches at each house to maintain the access.

183. **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:

- (i) Prepare and implement construction waste / spoils management plan (**Appendix C-13**);
- (ii) Leave spaces for access between mounds of soil;
- (iii) Provide walkways and metal sheets where required to maintain access across for people and vehicles;
- (iv) Increase workforce in the areas with predominantly institutions, place of worship, business establishment, hospitals, and schools;
- (v) Consult businesses and institutions regarding operating hours and factoring this in work schedules; and
- (vi) Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.
- (vii) Notify community/ water users in advance about likely interruptions in water supply.
- (viii) Provide alternate sources of clean water until water supply is restored.
- (ix) Provide all mitigation measures as given in resettlement plan (RP) prepared for the project to mitigate impacts on vendors and shopkeepers

184. **Socio-Economic-Employment.** Manpower will be required during the 36-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:

- (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; and
- (ii) Secure construction materials from local market.

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

- (i) Comply with all national, state and local labor laws (see **Appendix C-12**);
- (ii) 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 Training¹⁵ for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents;

¹⁵ 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

- (iii) Ensure that qualified first-aid is provided at all times. Equipped first-aid stations shall be easily accessible throughout the site;
- (iv) Provide medical insurance coverage for workers;
- (v) Secure all installations from unauthorized intrusion and accident risks;
- (vi) 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
- (vii) Provide supplies of potable drinking water;
- (viii) Provide clean eating areas where workers are not exposed to hazardous or noxious substances;
- (ix) 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;
- (x) 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;
- (xi) Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas;
- (xii) Ensure moving equipment is outfitted with audible back-up alarms;
- (xiii) 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
- (xiv) 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.

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

187. **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:

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.

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

188. Some part of the town is characterized by narrow roads. Particularly, the areas located in old town have very narrow roads with dense habitation and heavy traffic and are accessible only to pedestrians. Besides impeding the access, the trench excavation and pipe laying will pose safety risks to pedestrians, and the people living in these areas. Though the width (<500 mm) and depth (<750mm) of trench is minimal, it will pose safety risk, especially for children and elders. The construction contractor will be required to:

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

189. **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:

- (i) Consult 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) Provided temporary rest and eating area at all work sites;
- (v) 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

accommodation¹⁶ 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**);

- (vi) Prohibit employees from poaching wildlife and cutting of trees for firewood;
- (vii) Train employees in the storage and handling of materials which can potentially cause soil contamination;
- (viii) Recover used oil and lubricants and reuse or remove from the site;
- (ix) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;
- (x) Remove all wreckage, rubbish, or temporary structures which are no longer required; and
- (xi) Report in writing that the camp has been vacated and restored to pre-project conditions before acceptance of work.

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

- (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/historic sites, undertake excavation and construction work in such a way that no structural damage is caused to the religious building.
- (iii) Observe the local rituals and important dates of festivals, weekly/monthly/annual religious occasions in the religious places and do not make any disturbance/hindrance/obstacles during such time to the religious places,
- (iv) provide proper signage, barricades etc. to protect public and devotees from dangers of construction works.

191. 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:

- (i) Prepare and implement a Traffic Management Plan
- (ii) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;

¹⁶ https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_gpn_workersaccommodation

- (iii) Schedule transport and hauling activities during non-peak hours 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 for provision of traffic aids if transportation activities cannot be avoided during peak hours; and
- (vii) Notify affected sensitive receptors by providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.
- (viii) Maintain sufficient access to houses and shopkeepers (commercial establishments) during pipe laying work through metal sheets and temporary bridges
- (ix) Locate entry and exit points in areas where there is low potential for traffic congestion;

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

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

3. Operation and Maintenance Impacts

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

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

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

196. Water disinfection in the CWRs is one of the main operation activities of the water supply system. This activity produces wastewater, solid waste, and poses safety risk due to handling of chlorine. It is proposed to use chlorine for disinfection of water, therefore there is a safety risk due to handling of chlorine at the CWRs. Likely impacts will be negligible if the various suggested safety features and equipment to meet with any accidental eventuality are included in the design and development of the facility. During the operation phase, it is necessary that the facility is operated by trained staff as per the standard operating procedures.

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

- (i) Ensure that water supplied to the consumers at all times meet the drinking water standards; carry out regular sampling and testing, and disseminative information;
- (ii) Ensure that chlorinator facility is operated only by trained staff and as per the standard operating procedures; in case of any accident and/or maintenance activity, ensure that the staff follows documented procedures only; and
- (iii) Implement emergency response system (ERS) for the chlorine leakage; Guidelines and Emergency plan for handling and storing chlorine is attached as **Appendix C-22**.

198. **Sewerage System.** O&M of the sewerage system will be carried out by DBO contractor for 10 years and then by Sagwara Municipality directly or through an external operator. The sewerage system is intended to collect, convey, treat and dispose the sewage from the town areas safely. Operation will involve collection and conveyance of wastewater from houses to STP; treatment of sewage at STP to meet the disposal standards; and final disposal of treated wastewater, and treatment and disposal of sludge.

199. Treated wastewater is proposed to be utilized in reuse applications following the Sewerage and Wastewater Policy 2016 of Rajasthan, and accordingly reuse plan will be prepared by the DBO contractor during the detailed design phase. As stated previously, subproject will be implemented under DBO, and the successful bidder/DBO contractor will carry out detailed designs, therefore at present the subproject is designed in outline only. The treated wastewater if utilized for reuse purposes as per the reuse plan there will be no negative impacts, and in fact it will enhance environmental benefits in the form of water savings. Various measures to safeguard environment and health environment in utilizing the treated wastewater, including required quality for various process will be established in the reuse plan and will be implemented accordingly. All necessary safety, mitigation and monitoring measures as suggested in the reuse plan shall be implemented. Remaining treated effluent is proposed to be discharged in to the open space available in campus during rainy season. Mixing of industrial effluents in sewers may affect the inlet quality of sewage. It is therefore critical that STP receives the sewage with intended quality and treats the same to design discharge standards.

200. STP operational procedures will be firmed up during the detailed design phase, including the amount of automated or manual operation. It must be ensured that the facility is operated with standard operating procedures and only by trained staff. Ensuring uninterrupted power supply with back-up facility is a must. Standard operating procedures and operation manual will be prepared by the DBO contractor. Besides routine operation, this should cover all necessary items such as preventive maintenance, periodic maintenance and emergency maintenance, replacement of pumps, motors, and other electro-mechanical parts as per the design life to optimize energy use and system efficiency etc. Adequate resources – technical and financial, has been taken into consideration in the project design. Manual will also include safety awareness and mock drills for worker safety.

201. Subproject includes sludge management infrastructure in STP, including system for sludge collection, thickening, solar drying, and disposal at landfill/identified site. This includes a sludge sump to collect sludge from SBR basins; returning arrangement for supernatant from the sump to inlet/equalization tank for treatment; pumping sludge to sludge thickener and pumping thickened to mechanical sludge dewatering system (such as centrifuge). It also requires contractor to establish a shed where the dewatered sludge cake can be further air dried for 15 days. This is indicative sludge management system, and DBO contractor will design the system

meeting these requirements and prepare sludge management plan. Bid indicates that “the sludge produced from the treatment process would be processed so it may be used as fertilizer and soil conditioner” and it requires DBO contractor “to conform to the regulations of public health and environment protection norms”. The norms for safe use of processed sludge as fertilizer and soil conditioner are discussed earlier in this IEE. This follows the Sewerage and Wastewater Policy, 2016, which suggests “use of sludge produced from the treatment as fertilizer and soil conditioner after processing”. A sludge disposal site will be identified during the detailed design phase to dispose unutilized dried sludge in reuse applications. The updated IEE will include the details of disposal site. If the sludge is managed accordingly, there will no impacts.

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

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

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

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

- (i) Establish regular maintenance program, including:
 - (a) Regular cleaning of grit chambers and sewer lines to remove grease, grit, and other debris that may lead to sewer backups. Cleaning should be conducted more frequently for problem areas;
 - (b) Inspection of the condition of sanitary sewer structures and identifying areas that need repair or maintenance. Items to note may include cracked/deteriorating pipes; leaking joints or seals at manhole; frequent line blockages; lines that generally flow at or near capacity; and suspected infiltration or exfiltration;
 - (c) Monitoring of sewer flow to identify potential inflows and outflows; and
 - (d) Conduct repairs on priority based on the nature and severity of the problem;
 - (e) Immediate clearing of blockage or repair is warranted where an overflow is currently occurring or for urgent problems that may cause an imminent overflow (e.g., pump station failures, sewer line ruptures, or sewer line blockages).
- (ii) Review previous sewer maintenance records to help identify “hot spots” or areas with frequent maintenance problems and locations of potential system failure, and conduct preventative maintenance, rehabilitation, or replacement of lines as needed;
- (iii) When a spill, leak, and/or overflow occurs, keep sewage from entering the storm drain system by covering or blocking storm drain inlets or by containing and diverting the sewage away from open channels and other storm drain facilities (using sandbags, inflatable dams, etc.). Remove the sewage using vacuum equipment or use other measures to divert it back to the sanitary sewer system;
- (iv) Prohibit/prevent disposal of wastewater/effluent from industrial units in the sewers; ensure regular checking to ensure no illegal entry of industrial wastewater into sewers;
- (v) Develop an ERS for the sewerage system leaks, burst and overflows, etc.;
- (vi) Provide necessary health & safety training to the staff;
- (vii) Provide all necessary personnel protection equipment;
- (viii) During cleaning/clearing of manholes and sewer lines great precautions should be taken for the safety of workers conducting such works:
 - (f) As far as possible use remote/CCTV mechanism to identify/detect the problems in sewers and do not engage persons for this purpose;
 - (g) As far as possible use mechanized cleaning of manholes and sewers by using modern techniques and machines and do not engage persons for this purpose;
 - (h) Ensure that maintenance staff and supervisors understand the risks; provide proper instructions, training and supervision;
 - (i) Use gas detector to detect any hazardous or inflammable gas in confined areas like sewers/manholes prior to maintenance process;
 - (j) Provide suitable personal protective equipment that may include waterproof/abrasion-resistant gloves, footwear, eye and respiratory protection. Face visors are particularly effective against splashes. Equipment selection and a proper system for inspection and maintenance are important;

- (k) Provide adequate welfare facilities, including clean water, soap, nail brushes, disposable paper towels, and where heavy contamination is foreseeable, showers;
- (l) For remote locations portable welfare facilities should be provided;
- (m) Areas for storage of clean and contaminated equipment should be segregated and separate from eating facilities;
- (n) Provide adequate first-aid equipment, including clean water or sterile wipes for cleansing wounds, and a supply of sterile, waterproof, adhesive dressings;
- (o) Make effective arrangements for monitoring the health of staff; and
- (p) Keep emergency preparedness plan ready before starting the work of sewage system cleaning.

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

205. **Operation of FSSM.** Sagwara town is having 45 municipal wards. Out of 45, 19 wards have taken in FSSM. Full / Partial area of these wards which have scattered habitation at present taken in FSSM. For safe disposal of waste water generation from these pockets of wards FSM has been proposed. Households of these 8 wards will be covered with FSSM system wherein which septage from individual septic tanks at houses will be collected via mobile/vehicle mount tankers with suction equipment, transport and discharged into STP for safe treatment and disposal. Although system will be completely mechanized, given the very harmful nature of septage, following precautionary measures shall be implemented:

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

4. Cumulative Impacts

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

207. Both water supply and sewerage works are proposed to be taken up simultaneously in Sagwara Town, which is a small town congested with people, traffic and activities. There are sensitive places like hospitals, schools, and religious places. Works will be spread over entire town, covering all the roads and streets. Although no other notable public works are anticipated during the project implementation on public roads, there will be usual construction activities, such

as building construction, as Sagwara is a developing town. Given dry and windy weather conditions, dust generation from cumulative construction activities may be significant, and this may increase the particulate matter concentration in ambient air. Dust control measures suggested in the EMP aim to minimize the dust generation from the subproject construction activities. Suggested trenchless method, by avoiding excavation, will also help in reducing the overall dust generation from the subproject activities. Scheduling of works needs to be coordinated with the respective road agency (ULB or Public Works Department [PWD]). There is also a need to streamline water and sewer line works to avoid repeated excavations in the same road/street. The increase in road traffic, disturbance to traffic, public safety and worker safety issues, damage to existing utilities, influx of outstation workers, etc., due to various simultaneous construction works will be notable. However, the measures suggested in the EMP will minimize these impacts greatly, and therefore effective implementation of EMP must be ensured. Thus, the net impacts are unlikely to be significant.

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

III. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. Overview

209. 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.

210. 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; like Sagwara Nagar Palika, 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 during Project Preparation

211. 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 Sagwara in December 2021 - April 2022. **(Appendix C-2).**

212. A town level consultation meeting was also conducted at Sagwara on 13-08-2022, this meeting was attended by Municipal President Narendra Khodania, Vice President Raju Mama Sheikh, elected ward councillors of all 22 wards of Sagwara municipality, local public, NGOs and other officials of Sagwara municipality. The Junior Engineer Lokesh Patidar apprised the team about the proposed water supply sewerage plant for Sagwara and the proposed project of beautification of the ponds. In the meeting, Sagwara Municipal President Narendra Khodania told that as per the Chief Minister's budget announcement, Sagwara city was included in the fourth phase of RUIDP. Proposed projects in Sagwara (water supply, sewerage and lake development and city beautification) under the ADB funded project were discussed.

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

214. 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.

215. It was observed that people are willing to extend their cooperation as the proposed activities are supposed to enhance the infrastructure service levels and the living standard of the public. The public expressed their concern regarding the nuisance and disturbance (dust, road closure and traffic management activities) during the construction stage which can have impact on their day to day activities. Public demanded for advance notice before construction and proper warning signs along the construction area to avoid accidents and inconvenience. Public opined that an appropriate operation and maintenance system should be in place, especially for sewerage system, for its best functioning and to have the maximum health and aesthetic benefits. Project team responded to the issues on nuisance and disturbance, and O&M issues raised during the consultation that measures have been incorporated in the EMP. Regarding water supply people were ready to bear cost of water through modern meters but demanded continuous supply of water in day. Regarding sewerage works people were demanding sewage house connections in whole town because they are suffering a lot due to unsafe sewage disposal in drains. During consultations, it was found out that there are no movement of wildlife in project areas. Details of Public consultation, attendance sheet and photographs are attached as **Appendix 2.**

216. A town-level City Level Committee (CLC) has been formed in Sagwara 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 Sagwara on dtd. 29.07.2021 to discuss the matter of proposed Water Supply, waste water and gaps in other infrastructure in Sagwara under

the chairmanship of District Collector, Dungarpur, in presence of DPR consultants, RUDSICO-EAP officials, PHED officials, Municipal Council officials, AVVNL officials, PWD and other invitee members. Proposed scope of works and technology was discussed in the meeting. The feedback and concerns of the stakeholders were taken into consideration for finalization of design and scope of works. 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 2**.

217. Informal and formal consultation are conducted with local population of the area, about at 10 places along with proposed alignment with about 66 persons in month of December 2021 – April 2022. Discussions were held about proposed project components, EMP measures, grievance redressal, ownership of land, tree cutting, wastewater and logging problems and general people perception for proposed project. Due to pandemic situation, fewer consultations took place; only informal consultations were carried out. The consultations shall be done on regular basis and shall be reported in updated IEE Report/SEMR.

C. Consultation During Construction

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

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

D. Information Disclosure

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

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

222. Local communities will be continuously consulted regarding location of construction

camps, access and hauling routes and other likely disturbances during construction. The road closure together with the proposed detours will be communicated via advertising, pamphlets, radio broadcasts, road signage, etc.

IV. GRIEVANCE REDRESS MECHANISM

A. Project Specific Grievance Redress Mechanism

223. A project-specific, three-tier grievance redress mechanism (GRM) covers both environment and social issues. The GRM will be established to receive, evaluate, and facilitate the resolution of affected persons' concerns, complaints, and grievances about the social and environmental performance at project level. The GRM will aim to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns related to the project. Assessment of the GRM designed and implemented for Rajasthan Urban Sector Development Program (RUSDP)¹⁷ the system was effective in timely resolution of grievances in a transparent manner.¹⁸ The multichannel, project-specific, three-tier GRM is functional at RUSDP, hence the design of GRM for RSTDSP takes into account the proposed institutional structure for RSTDSP and the positive features and learnings from the previous GRM.¹⁹

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

225. 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

¹⁷ The procedures followed for grievance redress during implementation of RUSDP Phase III included the project GRM and the pilot GRM software application (smart check) in Pali, the Sampark portal of Government of Rajasthan, and the Chief Minister's helpline. Complaints received through various channels were mostly minor and pertained to damage to existing water supply pipelines and disruption of water supply during construction, delays in road restoration, and pending new connections. Complaints related to damage to private property (compound walls/steps, etc.) were less in number. The grievances were mostly possible to resolve in coordination with the contractors. Complaints received were immediately referred by the CAPC/PMDSC supervision staff to the PIU Nodal officer (safeguards) and concerned engineer at PIU, who advised them on further action. Follow up with the contractor on complaint resolution was undertaken by PIU Nodal officer CAPC and PMDSC and final feedback sought from complainant upon resolution. Complaints requiring inter-departmental coordination were referred to the PMU for resolution, and feedback provided to complainant. The PMU kept regular track of grievances through WhatsApp and email alerts, ensuring registration and follow-up until resolution.

¹⁸ Town-level grievance registration data indicates that a large number of grievances were registered, pointing to the effectiveness of the multi-channel GRM. No major grievance was received for RUSDP Phase III. The GRM helped smoothen the process of project implementation, hence the proposed architecture for the RSTDSP GRM remains similar, with some refinement, taking into account the changes in institutional setup proposed for project implementation.

¹⁹ 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.

information, and contact details of key personnel from PIU and contractors.

B. Grievance Redress Process

226. 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 site²⁰ or by sending a WhatsApp message to the PIU²¹ or by dialling the phone number of town level PIU/CAPPC or by dialling a toll-free number.²² Any aggrieved person can also avail the facilities of online grievance monitoring system 'Rajasthan Sampark' portal to register their grievances which is a parallel mechanism of grievance registration, in addition to the project GRM.²³ Careful documentation of the name of the complainant, date of receipt of the complaint, address/contact details of the person, location of the problem area, and how the problem was resolved will be undertaken and feedback provided to the complainant on action/decision taken. The Safeguard and safety officer of town/city level PIU will have the overall responsibility for timely grievance redressal on environmental and social safeguards issues and for registration of grievances, related disclosure, with the assistance of project consultants. In case of grievances that are immediate and urgent in the perception of the complainant, the contractor, and officials of PIU with assistance from CMSC and CAPPC on-site will provide the most easily accessible or first level of contact for quick resolution of grievances. Contact numbers and names of the concerned PIU safeguard and safety officer, contractors, CAPPC and CMSC personal will be posted at all construction sites at visible locations.

- (i) **1st level grievance.** The contractors, PIU executive engineer/assistant engineer designated as safeguard and safety officer (social and environment), CMSC (safeguard staff) and CAPPC can immediately resolve issues on-site, in consultation with each other and will be required to do so within 7 days of receipt of a complaint/grievance. If required, city level monitoring committee (CLMC)²⁴ will be involved in resolution of grievances at the 1st level;
- (ii) **2nd level grievance.** All grievances that cannot be redressed within 7 days at field/PIU level will be brought to the notice of Zonal PIU headed by Additional Chief Engineer (ACE). The ACE at zonal PIU will resolve the grievance within 7 days of receipt of complaint/grievance in discussion with the ASO, field level PIU, CMSC, CAPPC and the contractor; and
- (iii) **3rd level grievance.** All the grievances that are not addressed by Zonal PIU within 7 days of receipt will be brought to the notice of the PMU. Depending on the nature of grievance, the project officer (social/environment) at PMU will resolve the grievance within 15 days of receipt of grievance with necessary coordination of

²⁰ 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.

²¹ 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.

²² Project contractors in all project towns will have a toll-free number with specific working hours for registration of grievances related to RSTDSP.

²³ <http://www.sampark.rajasthan.gov.in/RajSamWelcome.aspx>

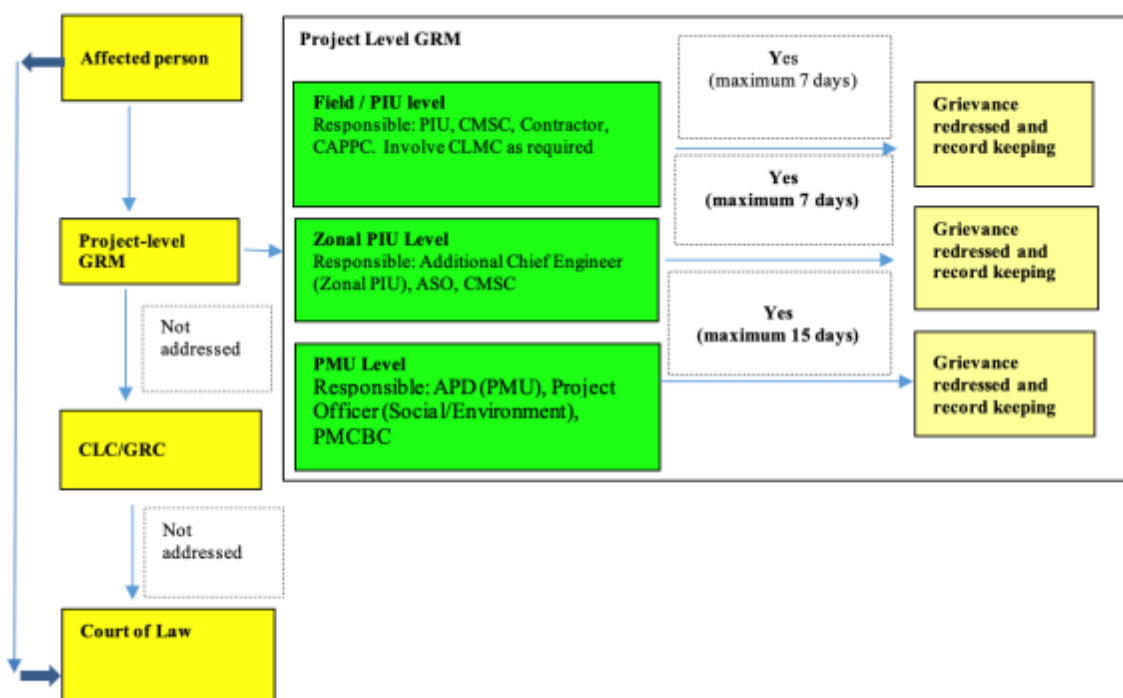
²⁴ The CLMC has been formed at the town/city level for planning and monitoring of work, resolve issues related to departmental coordination etc. It is headed by Commissioner/Executive Officer ULB (Chairman) and city engineer of public health engineering department (PHED), public works department (PWD) and head of PIU acting as Member Secretary.

- Zonal PIU and CMSC and guidance/instruction of additional project director (APD-PMU).
- (iv) Grievances not redressed through this process within/at the project level within stipulated time period will be referred to the CLC/GRC, which has been set up.²⁵ 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.

227. The multi-tier GRM for the project is outlined below (**Figure 22**), 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.

²⁵ 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 22: Grievance Redress Process



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

228. 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), 2013.²⁶

229. People who are, or may in the future be, adversely affected by the project may submit complaints to ADB's Accountability Mechanism. The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, affected people should make an effort in good faith to solve their problems by working with the concerned ADB operations department. Only after doing that, and if they are still dissatisfied, should they approach the Accountability Mechanism.²⁷

230. **Record-keeping.** The PIU of each town and PMU will both keep records of grievances received, including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions and the date these were affected and final outcome. The

²⁶The Authority admits grievance only with reference to the Land Acquisition and R&R issues under the RFCTLARRA, 2013.

²⁷ Accountability Mechanism. <http://www.adb.org/Accountability-Mechanism/default.asp>

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.

231. **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.

232. **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.

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

V. ENVIRONMENTAL MANAGEMENT PLAN

A. Environmental Management Plan

234. 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.

235. 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.

236. 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. Tables below present 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
Design of Sewage Treatment Plant	Treated effluent not meeting the disposal standards and associated impacts on receiving environment	STP design to meet latest norms for wastewater disposal into inland water bodies (ref Appendix C-8 for detailed parameters) including: • BOD < 10 mg/l • Total Suspended Solids < 20 mg/l • Fecal coliform < 100/100 ml	RSPCB, Consent etc.,	Consultants / PMU	Project Costs
	Impairment of STP treatment efficiency	• Ensure continuous uninterrupted power supply • Provide back-up facility (such as generator) and make sure that adequate fuel supplies during operation for running of generator when required; • Provide operating manual with all standard operating procedures (SOPs) for operation and maintenance of the facility; this should include guidance on the follow up actions in case of process disruptions, inferior quality of treated water; etc. Necessary training (hands-on and class room / exposure visits) shall be provided to the ULB staff dealing with STP. • The scope of work of facility contractor should include extended operation period (at least five years) to ensure smooth operation, training to the ULB staff and transfer of facility to Sagwara Nagar Palika • Design should include online monitoring for the minimum BOD, pH and Ammonia at the inlet and outlet of the plant	RSPCB Consent etc.	Consultants / PMU	Project Costs
	Odor nuisance and aesthetics	• Provide a green buffer zone of 10-20 m wide all around the STP with trees in multi-		DBO Contractor / PIU	Project costs

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
		rows. This will act as a visual screen around the facility and will improve the aesthetic appearance. Treated wastewater shall be used for plantation. Develop layout plan of STP such that odor generating units (such as sludge / solids handling facilities) are located away from the surrounding area with future development potential.			
	Mixing of industrial effluent with sewage	- No industrial wastewater shall be allowed to dispose into municipal sewers - No domestic wastewater from industrial units shall be allowed into municipal sewers - Ensure that there is no illegal discharge through manholes or inspection chambers - Conduct public awareness programs; in coordination with RSPCB, issue notice to all industries for compliance - Conduct regular wastewater quality monitoring (at inlet and at outlet of STP) to ensure that the treated effluent quality complies with the standards	RSPCB Consent	PIU / ULB	Project Costs
STP	Treated effluent discharge into water channel/drains and associated impacts on river water and downstream users	- Obtain of consent of RPCB for discharge of treated wastewater into drains - Conduct a baseline water quality assessment of receiving water body - Regularly monitor the treated wastewater quality at STP and ensure that it meets the discharge standards - Monitor water quality periodically during operation phase as per the Environmental Monitoring Plan	RSPCB Consent	PIU / ULB	Project Costs

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
STP	Sludge management and reuse	• Prepare a sludge management plan • Prepare a dried Sludge utilization plan for Khetri within the help of Agriculture Department / CLC; plan should also include if any additional processing is required for sludge to use as soil conditioner • Plan should clearly various potential uses and demand in Khetri and surroundings • Establish usage limits, where required, • geographical / crops / type of application / type of soils etc.); adopt international good practice suggested by agencies like World Health Organization (WHO), Food and Agricultural Organization (FAO) of the United Nations. • Identify a landfill / suitable site for disposal of surplus dried sludge • Monitor sludge quality during operation phase as per the Environmental Monitoring Plan, ensure that it meets the quality parameters established by FCO • In case of sludge not meeting the quality parameters, it shall not be used as soil condition, and shall be disposed at appropriate disposal site (if it falls under hazardous • category, it shall be disposed as per the Hazardous Waste Management Rules, 2016)	RSPCB Consent , regular testing results	DBO Contractor/PIU	
Site preparation	Removal of solid waste and other nuisance materials	• Ensure that the project sites are cleared of solid waste or other nuisance materials • Dispose solid waste from existing sites and materials into designated locations		PIU	Project costs

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
		(dumping in vacant lot is not allowed) – provides the documentation for the Materials Recovery Facility and the Checklist for Solid Waste Management Transport			
Design of water supply and sewerage system	Non-compliance or non-adherence with the environmental considerations proposed in preliminary designs during detailed design:	Ensure compliance with the following during the detailed design: • Adopting conjunctive use approach water source; utilizing feasible surface water sources and groundwater source optimally thereby reducing the existing groundwater abstraction to the extent possible • Locating components and facilities appropriately by avoiding sensitive locations like forests and protected areas (environmentally, socially, and archeologically). • Treatment and reuse of sludge from sewage treatment process; providing a covered shed of adequate space to air dry the processed sludge for at least 15 days at STPs • Designing the entire system to maintain optimal flow and terminal pressure, and optimising the overall energy usage • Avoiding usage of asbestos containing materials • Reducing the incidence of water borne diseases by providing 100% population including urban poor with potable water supplies • Reuse of treated wastewater from STP for non-potable uses thereby reducing the			

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
		load in freshwater resources - Adopting a combined approach of sewerage system and fecal sludge and septage management to cover 100% population of the town with safe collection, conveyance and treatment of sewage generated in the town - Provision of appropriate personal protection equipment to the workers and staff			
Location impacts of proposed components	Nearby community may be affected due to increased pollution during construction and operation	- sites should be selected so that nearby community may have no or minimum impact due to proposed works - 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	- sites should be selected so that minimum tree cutting is required - project documents should include the minimum tree cutting provisions - 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	- Use energy efficient electrical equipment - Provision of use of energy efficient equipment in contract agreements and BOQ	As per BEE norms	Consultants/PMU	No cost required
Preparation of treated effluent reuse plan and Sludge reuse	Loss of natural resource of water, improvement of local income	Contractor to develop, design, implement and operate the treated effluent reuse plan and sludge reuse plan in consultation with the ULB	Approved Plan included in the Contractor's Scope of Works	Contractor/PMU	Project Costs

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
plan (During SIP)					
Seismic sensitivity	Damage to infrastructure and potential risks: project area in low earthquake risk zone (Zone III)	Designs of project component structures shall comply with relevant codes of design such as Bureau of Indian Standard (BIS) specifications for earthquake resistant design (IS: 1893: Criteria for earthquake resistant design of structures).		DBO Contractor/PIU	Project costs
CWR and STP	Hazardous / harmful chemicals used for disinfection of treated water from STP and clear water in CWRs	• Reduce the use of chemicals in the treatment process to the extent possible (water treatment); provide non-chemical alternatives or easily recoverable and/or reusable chemicals or biocompatible alternatives. • Establish proper handling / storage / application system according to the relevant standards, safety precautions and prevent accidental release / spill • Provide leak/spill detection, collection / capture and safe disposal facilities such as chlorine absorption and neutralization facility • Provide ventilation, lighting, entry and exit facilities; visible & audible alarm facilities to alert chemical/chlorine leak • Facility for isolation in the event of major leakages • Eye wash & shower facility • Personal protection and safety equipment for the operators (masks, oxygen cylinders, gloves, etc.,) • Provide training to the staff in safe handling and application of chemicals, material safety, and standard operating		DBO Contractor/PIU	Project costs

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
		procedures and emergency responses • Develop emergency response procedures			
Sewage pumping station	Handling and disposal of accumulated waste at identified disposal sites	• Prepare a waste handling and management plan for the work, considering handling, disposal and occupational and public health safety • Assess the working conditions, develop appropriate working method, and work shall be only conducted under continuous supervision of EHS supervisor • Waste shall not be handled manually; use appropriate equipment • All workers shall be provided with necessary personal protection equipment, including gloves, boots, face / gas masks and oxygen cylinders in handy for emergency use etc.; if gas emission is suspected at any point of time, workers shall use gas masks with oxygen cylinders • Inform surrounding public about the work • Fire control and safety equipment shall be provided at the work site • Waste shall be properly covered during transport • Manage the solid waste as per the Solid Waste Management Rules, 2016		DBO Contractor/PIU	Project costs
Sewer network – collection & conveyance	Poor design leading to overflows, blockages, and creating nuisance, pollution	• Limit the sewer depth where possible • Sewers shall be laid away from water supply lines and drains (at least 1 m, wherever possible); • In all cases, the sewer line should be laid deeper than the water pipeline (the difference between top of the sewer and bottom of water pipeline should be at least		DBO Contractor / PIU	Project costs

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
		300 mm) • In unavoidable, where sewers are to be laid close to storm water drains, appropriate pipe material shall be selected (stoneware pipes shall be avoided) • For shallower sewers and especially in narrow roads, use small inspection chambers in lieu of manholes; • Design manhole covers to withstand anticipated loads & ensure that the covers can be readily replaced if broken to minimize silt/garbage entry • Ensure sufficient hydraulic capacity to accommodate peak flows and adequate slope and gas vents in gravity mains to prevent buildup of solids and hydrogen sulfide generation • Take necessary precautionary measures to protect sewer network, and to avoid disposal of solid wastes, debris, wastewater into newly laid sewers from the time it is constructed to the start of operation phase			
FSSM	Occupational health and safety issues, and impact on STP process	• Conduct detailed survey of the households to be covered with FSSM to design the system to suit the local conditions, such as type of septic tanks and their location in the houses • Create awareness program on the FSSM from collection to treatment system that will be adopted • Design the sewage treatment process duly considering mixing of septage		DBO Contractor / PIU	Project costs

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
		• Ensure that the FSSM system is completely mechanized no human touch, even accidentally, from collection at household to discharge into STP, and in periodic cleaning of tankers • Demarcate a proper area for cleaning of mobile tankers in STP premises, and ensure that the wastewater shall be discharged into STP • Provide proper training to the workers, and staff in safe handling of FSSM tasks, provide all necessary personal protection equipment • Ensure proper facilities for workers including showers, wash areas, toilets, drinking water, eating and resting places • Conduct regular health checks • Prepare Health and Safety Plan for FSSM			
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
Asbestos cement (AC) pipes in existing water supply system:	Health impacts due to air borne asbestos if handled unsafely, cut, drilled or broken into pieces	• Develop ACM Management Plan (AMP) that includes identification of hazards, the use of proper safety gear and disposal methods. Sample ACM is provided in Appendix C-20..		DBO Contractor/PMU	Project costs

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
clearing, transfer and disposal; work in narrow streets, and interventions in existing AC pipelines		• 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. • Maintain records of AC pipes as per the AMP • Refer to the instructions of the Asbestos Expert			

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 and Source of Funds
Legal compliance	Environmental legal noncompliance may attract legal actions Failure to obtain necessary consents, permits, NOCs etc. can result to design	(i) Obtain all consents, clearances (CTE/CTO from RSPCB), permits NOCs etc. before start of construction works Ensure that all necessary approvals for construction to be obtained by contractor	Consents, permits, clearance, NOCs, etc.	PIU/Consultants in coordination of Nagar Palika, Sagwara	PMU	Cost of obtaining all consents, permits, clearance, NOCs etc. prior to start of civil works responsibility of PIU.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
	revisions and/or stoppage of works	are in place before start of construction Refer table 10&11 for consent requirements				
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 lines within proposed project area	(i) Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase; and (ii) Require construction contractors to prepare a contingency plan to include actions to be taken in case of unintentional interruption of services. (iii) Require contractors to prepare construction waste / spoils management plan (Appendix C-13) and traffic management plan (Appendix C-14)	-List and maps showing utilities to be shifted -Contingency plan for services disruption	Contractor in collaboration with PIU and with approval of PMU	CMSC/ PIU	No cost required. Mitigation measures are part of TOR of PMU, PIU and Consultants
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	-PIU approval sites for construction work camps, areas for stockpile, storage and disposal	Contractor to finalize locations in consultation and approval of PIU	CMSC/ PIU	No cost required. Mitigation measures are part of TOR of PIU and Consultants and also part of contractual terms

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		drinking water supply systems; Do not consider residential areas; (iv) Take extreme care in selecting sites to prevent direct disposal to water body which will inconvenience the community. (v) For excess spoil disposal, Contractor will prioritize the use of solid/construction waste disposal sites operated under the consent from RSPCB. If unavailable or not feasible, contractor shall identify disposal site confirming to the following criteria, obtain permissions from local body and other government agencies as required, and submit for the approval of PIU; disposal sites shall be used only after approval of the PIU: (a) sites shall not be located in forest areas, water bodies or drainage lines, swamps or in areas which will inconvenience the community (b) site shall be selected preferably from barren, infertile lands. (c) no residential areas shall be located within 50 m	-Waste management plan			

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		downwind side of the site; and (d) site is minimum 250 m away from sensitive locations like hospitals, religious places, ponds/lakes or other water bodies				
Sources of Materials	Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.	(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 If additional quarries will be required after construction is started, inform construction contractor to obtain a written approval from PIU. Bid document to include requirement for verification of suitability of sources and permit for additional quarry sites if necessary.	Permits issued to quarries/sources of materials	Contractor to prepare list of approved quarry sites and sources of materials with the approval of PIU	CMSC/ PIU	No cost required. Mitigation measures are part of TOR of PIU and Consultants and also part of contractual terms
Consents, permits, clearances, NOCs, etc	Failure to obtain necessary consents, permits, NOCs, etc. can result to design revisions and/or stoppage of works	Obtain all necessary consents (including CTE for STP from RSPCB), permits, clearance, NOCs, etc. prior to award of civil works. Following consents are required- Tree cutting- local authority	Consents, permits, clearance, NOCs, etc.	PIU and Consultants	CMSC/ PIU	No cost required. Cost of obtaining all consents, permits, clearance, NOCs, etc. prior to start of civil works responsibility of PIU.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		Storage, handling and transport of hazardous materials- RSPCB Sand mining, quarries, borrow areas- Department of mines and Geology Traffic diversion/road cutting- local authority, traffic police Ensure that all necessary approvals for construction to be obtained by contractor are in place before start of construction Acknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs, etc. Include in detailed design drawings and documents all conditions and provisions if necessary				Mitigation measures are 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	Training Plan and its implementation Achievement of the environmental performance targets by the Contractor;	Construction Contractor	CMSC/ PIU	Cost of EMP Implementation Orientation Training to contractor is responsibility of PMU. Other costs responsibility of contractor.
Air Quality	Emissions from construction vehicles, equipment, and machinery used for installation of pipelines resulting to dusts and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulphur oxides, particulate matter, nitrous oxides, and hydrocarbons.	(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	-Visual inspection -No complaints from sensitive receptors -Records -PUC certificates - CTE and CTO; -Periodic Air Quality Monitoring;	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
Water quality	Mobilization of settled silt materials, and chemical contamination from fuels and lubricants during installation of pipelines can contaminate nearby surface water quality.	(i) Prepare and implement a construction waste / spoils management plan (Appendix C-13) (ii) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets; (ii) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies; (iii) Place storage areas for fuels and lubricants away from any drainage leading to water bodies; (iv) Dispose any wastes generated by work in designated sites; and (v) Conduct surface quality Monitoring according to the Environmental Management Plan (EMP).	Areas for stockpiles, storage of fuels and lubricants and waste materials; -Number of silt traps installed along trenches leading to water bodies; -Records of surface water quality Monitoring; -Effectiveness of water management measures; -No visible degradation to nearby drainages, nallahs 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; (iii) Minimize noise from construction equipment by using vehicle silencers,	-Complaints from sensitive receptors; -Use of silencers in noise-producing equipment and sound barriers;	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
		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	-Equivalent day and night time noise levels (see Appendix C-18 of this IEE)			
Surface water quality	Works in rains/ Mobilization of settled silt materials, and chemical contamination from fuels and lubricants during installation of pipelines can contaminate nearby surface water quality.	(i) Prepare and implement a construction waste / spoils management plan (ii) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets; (iii) Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with PIU on designated disposal areas; (iv) Inspect all the drainage at construction site/construction camp/labor camp etc. and clear all the drainage lines so that no water stagnation/flooding may occur during heavy rainfall (v) As for a possible avoid trench works and excavation works (pipe laying) during monsoon season to avoid any water logging and accident due to it (vi) 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.	(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 inspection; (iv) Effectiveness of water management measures; (v) No visible degradation to nearby drainages, nallahs or water	DBO 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) Inspect and verify all the emergency measures and emergency control system before start of monsoon, keep the emergency response committee on high alert during monsoon/heavy rain fall (ix) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies; (x) Place storage areas for fuels and lubricants away from any drainage leading to water bodies; (xi) Dispose any wastes generated by construction activities in designated sites; and (xii) Conduct surface quality inspection according to the Environmental Management Plan (EMP).	bodies due to civil works			
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	-CTO and CTE compliance; -Periodic GW Quality Monitoring Reports; -Areas for storage of fuels and lubricants and waste materials; - Number of oil traps installed in oil and lubricant storage areas; ;	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
Soil contamination, 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) Store fuel, oils, lubricants etc on impervious and protected areas, ensure spill control kits, and proper containments bunds to ensure no spillage (ii) Prepare and implement construction waste/ spoils management plan (Appendix C-13); (iii) Avoid stockpiling of excess excavated soils; (iv) Coordinate with ULB/PIU for beneficial uses of excess excavated soils or immediately dispose to designated areas; (v) Recover used oil and lubricants and reuse or remove from the sites; (vi) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas; (vii) Remove all wreckage, rubbish, or temporary structures which are no longer required; and (viii) Request PIU to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.	(i) Complaints from sensitive receptors; (ii) Worksite clear of hazardous wastes such as oil/fuel (iv) Worksite clear of any excess excavated earth, excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Existing Infrastructure and Facilities	Disruption of service and damage to existing infrastructure 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) 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.

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

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(ix) Provide pedestrian access in all the locations until normalcy is restored.				
Socio-Economic Income. –	Impede the access of residents and customers to nearby shops	(i) Prepare and implement construction waste / spoils management plan (Appendix C-13). Contractor to Implement RP and to follow mitigation measures prescribed such as- (ii) Leave spaces for access between mounds of soil; (ii) Provide walkways and metal sheets where required for people; (iii) Increase workforce in front of critical areas such as institutions, place of worship, business establishment, hospitals, and schools; (iv) Consult businesses and institutions regarding operating hours and factoring this in work schedules; and (v) Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.	(i) Complaints from sensitive receptors; (ii) Construction waste / Spoils management plan (iii) Number of walkways, signages, and metal sheets placed at project location.	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Socio-Economic Employment -	Generation of temporary employment and increase 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)	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) (B) Ensure that qualified EHS personnel is deputed to look the H&S matter	(i) Site-specific OH&S Plan; (ii) Equipped first-aid stations;	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(i) Develop and implement site-specific occupational health and safety (OH&S) Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use personal protective equipment like helmet, gumboot, safety belt, gloves, nose musk and ear plugs; (c) OH&S Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents; (ii) Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site; (iii) Provide medical insurance coverage for workers; (iv) Secure all installations from unauthorized intrusion and accident risks; (v) The project area experiences extreme temperature during summer months of April and May, which may affect the health of workers engaged in construction work. Contractor should take necessary measures during summers including the following: (a) work schedule should be adjusted to avoid peak temperature hours (12 – 3 PM); (b) provide appropriate shade near the work place; allow periodic resting and provide adequate water, and (c) provide necessary medicine and facilities to take care of dehydration related health issues	(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 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			responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(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; (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	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
		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.				
Occupational and community health & safety – asbestos containing material handling (AC pipes)	Hazardous working conditions due to presence of asbestos containing material / AC Pipes in work sites	(i) Develop and implement Asbestos Management Plan (AMP); AMP should be prepared during detailed design and should form part of the IEE; Engage experts on asbestos management to develop the plan following international best practice such as the approach recommended by the United States Environmental Protection Agency (USEPA) (ii) AMP inter alia, should include: a. Regulatory framework b. Identify location of AC pipes or Asbestos Containing Materials (ACM) in the existing facilities that are to be rehabilitated and / or dismantled under the subproject, c. assess the condition of such AC pipes and ACM, if any, d. procedures for monitoring its condition e. procedures to assess the locations where AC pipes / ACM present to avoid damage f. Awareness and training of staff/workers to avoid damage and prevent exposure g. Most appropriate, safe and least cost approach suitable for local	(i) Asbestos management plan preparation and implementation (iii) quantity and characteristics of asbestos containing material removed/handled and disposed safely	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
		conditions in managing existing AC pipes and ACM; h. AC pipes protocol to be applied in any instance that AC pipes are encountered, to ensure that appropriate action is taken. i. AMP implementation arrangements and costs (iii) the plan should, inter alia assess, whether it is possible to lay new pipes without disturbing the underground AC pipes, accidentally or otherwise, whether it is appropriate to leave them in-situ in the ground without disturbing or more appropriate to remove the AC pipes and dispose in hazardous waste disposal sites, (iv) Detailed H&S procedure to protect both workers and citizens. This should comply with national and international standards for dealing with asbestos and should include: (a) removal of all persons to a safe distance; (b) usage of appropriate breathing apparatus and protective equipment by persons delegated to deal with the AC material; and (c) Procedures for the safe removal and long-term disposal of all asbestos-containing material encountered. (v) The project shall allocate specific budget in developing and implementing the AMP (vi) Implement AMP, and report compliance to ADB via Environmental Monitoring Reports				

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Community Health and Safety.	Traffic accidents and vehicle collision with pedestrians during material and waste transportation	(i) Plan routes to avoid times of peak-pedestrian activities. (ii) Liaise with PIU/ULB in identifying high-risk areas on route cards/maps. (iii) Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure. (iv) Provide road signs and flag persons to warn of on-going trenching activities.	As per Traffic Management Plan given in Appendix C-14.	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Safety of sensitive groups (children, elders etc.) and others pedestrians in narrow streets	Trench excavation in narrow streets will pose high risk to children and elders in the locality	(i) Provide prior information to the local people about the nature and duration of work (ii) Conduct awareness program on safety during the construction work (iii) Undertake the construction work stretch-wise; excavation, pipe laying and trench refilling should be completed on the same day (iv) Provide barricades, and deploy security personnel to ensure safe movement of people and also to prevent unnecessary entry and to avoid accidental fall into open trenches	-H&S plan including appropriate signs for each hazard present -Construction vehicles condition in H&S plan.	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, solvents, and lubricants	(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 liability at work camps are maintained at the highest standards possible at all times;	-Condition in list of preapproved sites for construction work camps, areas for stockpile, storage and disposal prepared by the Contractor.	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
	Unsanitary and poor living conditions for workers	(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.				
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's otherwise sound proof/super silent Diesel Generator set should be available (iv) Sound level should not increase as per EMP (v) Illumination should be adequate as required according to nature of works (vi) As far as possible ready mix concrete from batching plant to be used, otherwise the concrete should be prepared away from residential areas and brought to the site (vii) All the noise activity like hammering, cutting, crushing, running of heavy equipment's should be done	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
		in day time and avoided in night time (viii) Workers engaged in night works should have adequate rest/sleep in day time before start of night works (ix) Worker engaged for night works should have previous experience of night works and should be physically fit for such works including clear vision in night (x) All the necessary provisions of traffic aids such as traffic signals, road signage, barricades, cautions boards, traffic diversion boards etc. should be available with fluorescent/retro-reflective arrangements (xi) Workers should be trained before start of night works about risks and hazards of night works and their mitigation measures and should be provided all the protective aids (PPEs) including fluorescent/retro-reflective vests (xii) Horns should not be permitted by equipments and vehicles (xiii) Workers should not shout and create noise (xiv) First aid and emergency vehicles should be available at site (xv) Emergency preparedness plan should be operative during night works (xvi) Old persons and pregnant women and women having small kids should not work in night time (xvii) All the vehicles and equipments being used at night works should have adequate type of silencers/enclosures/mufflers to				

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		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 and disturbance to socio cultural resources	(i) develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved. This should involve: (ii) Conduct awareness training to contractor & supervision staff prior to start of excavation; (iii) Stopping work immediately to allow further investigation if any finds are suspected; (iv) Calling in the ASI/state archaeological department if a find is suspected, and taking any action they require to ensure its removal or protection in situ (v) 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 (vi) Adjacent to religious/social sites, undertake excavation and construction work in such a way that no structural damage is caused to the religious building.	Consultation records	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) Observe the local rituals and important dates of festivals, weekly/monthly/annual religious occasions in the religious places and do not make any disturbance/hindrances/obstacles during such time to the religious places, (xix) provide proper signage, barricades etc. to protect public and devotees from dangers of construction works.				
Monsoon preparedness	Disruption of utilities and water logging in trenches	(i) As for a possible avoid trench works and excavation works (pipe laying) during monsoon season to avoid any water logging and accident due to it (ii) if open trenches are not avoidable during monsoon, keep ready all the mitigations measures to avoid water logging such as dewatering pumps and sufficient pipes, traffic assistance, barricades etc. (iii) Guidelines for safety during monsoon is attached as Appendix C-19	As per monsoon preparedness plan & as per Appendix C-19 "Guidelines for Safety during Monsoon/Heavy Rainfall"	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Submission of EMP implementation report	Unsatisfactory compliance to EMP	(i) Appointment of supervisor to ensure EMP implementation (ii) Timely submission of monitoring reports including pictures	Availability and competency of appointed supervisor Monthly report	Construction contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
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	Compliance of COVID-19 protocol and guidelines	Construction contractor	CMSC/ PIU	Contractor

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(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 &C-24)				
Post-construction clean-up	Damage due to debris, spoils, excess construction materials	(i) Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and (ii) All excavated roads shall be reinstated to original condition. (iii) All disrupted utilities restored (iv) All affected structures rehabilitated/compensated (v) The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these shall be cleaned up. (vi) All hardened surfaces within the construction camp area shall be ripped, all imported materials removed, and the area shall be top soiled and regrassed using the 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.	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.

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 Source and of Funds
Construction disturbances, nuisances, public & worker safety	All work sites	Implementation of dust control, noise control, traffic management, & safety measures. Site inspection checklist to review implementation is appended at Appendix C-16	All the dust control will be done by water sprinkling measures at site, noise will be kept well within prescribed limits of standards, Follow Traffic management Plan as given in Appendix C-14 and all the safety measures such as PPE's etc. Site inspection will be done as per checklist given in Appendix C-16	Weekly during construction	Supervising staff and safeguards specialists	No costs required
Check the leakages blockages, overflow problem in sewers	It may affect the sewer system, contaminate land, water and create public health issues	Effective operation to avoid and/or immediate clearance of such leaks, blockages Implementation of regular O&M schedules	Follows regular O & M schedule	Sagwara Nagar Palika/O&M contractor	Sagwara Nagar Palika	DBO contractor cost O&M Cost
	Occupational health & safety: for personnel cleaning underground sewers there is a risk due to oxygen deficiency and harmful gaseous emissions (hydrogen sulphide, carbon monoxide, methane, etc.);	(i) Provide necessary health & safety training to the staff engaged sewer cleaning & maintenance (ii) provide appropriate personal protection equipment (including oxygen masks)	-Training and Awareness campaign for Occupational, Health & Safety to ensure the use of PPE's.	Sagwara Nagar Palika/O&M Contractor	Sagwara Nagar Palika	O&M Cost
Consent to Operate	Periodical renewal of consent to operate, if not done, may attract penal action from State Pollution Control Board	Renew the consent to operate (CTO) of STP before expiry date and follow all the conditions set forth in CTO	RSPCB	Sagwara Nagar Palika/PHED/ O&M Contractor	Sagwara Nagar Palika/PHED/ O&M Contractor	Sagwara Nagar Palika/PHED/ O&M Contractor

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost Source and of Funds
Treated effluent quality	Water pollution of the receiving body if treated effluent does not meet the standards set by CPCB/RSPCB	Regular monitoring (parameters tests) of treated effluent quality Follow all the parameters given in CTE/CTO	Test results records	Sagwara Nagar Palika/O&M Contractor	Sagwara Nagar Palika/O&M Contractor	Sagwara Nagar Palika/O&M Contractor
Reuse of Treated effluent/safe disposal	Adverse impact on water hydrology and crops	Prepare a plan of reuse of treated effluent in agriculture or other gainful purposes	Records on treated water reuse	Sagwara Nagar Palika/O&M Contractor	Sagwara Nagar Palika/O&M Contractor	Sagwara Nagar Palika/O&M Contractor
Achieving targeted sludge reuse	Violation of ULB commitment under the project. Moreover, a land has been identified for safe sludge disposal. Hence, it is imperative to achieve the targeted sludge reuse under the project.	Ensure that the targeted sludge reuse is achieved throughout the project period	Records	Sagwara Nagar Palika/O&M Contractor	Sagwara Nagar Palika/O&M Contractor	Sagwara Nagar Palika/O&M Contractor
Safety precautions during sewage manhole cleaning	Health and safety risk to workers engaged in sewage manhole cleaning	Ensure all the safety equipment are available during manual cleaning As far as possible, use CCTV and mechanical cleaning (sewage jetting machine) for cleaning of manhole	-Training and Awareness campaign for Occupational, Health & Safety to ensure the use of PPE's.	O&M contractor for 10 years and then Nagar Palika, Sagwara	Nagar Palika, Sagwara	Nagar Palika, Sagwara
Routine maintenance of CWR and other facilities to ensure delivery of safe drinking water	Health impact due to supply of unsafe drinking water in the system	Ensure periodical maintenance and cleaning of OHSRs, CWRs to ensure delivery of safe drinking water Periodical testing of treated water to ensure treated water quality meets the required standards	Maintenance Records	O&M contractor for 10 years and then PHED, Sagwara	PHED, Sagwara	O&M cost of contractor
Leakages in water supply pipe lines	Entry of waste water into water supply pipes and health risk to public due to poor quality water	Ensure to identify and repair leakage immediately Strengthen grievance mechanism and attend the grievance of any leakage	Maintenance Records; Periodic Leakage Report;	O&M contractor for 10 years and then PHED, Sagwara	PHED, Sagwara	O&M cost of contractor

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost Source and Funds
Asset management	Reduction in NRW Increased efficiency of the system	Preparation and implementation of O&M Manual	O&M Manual; Implementation Records;	O&M contractor for 10 years and then PHED , Sagwara	PHED, Sagwara	O&M cost of contractor

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	STP, SPS, Pipe laying, OHSRs and CWR sites	Tree cutting permit taken, Tree cutting done	Continuous	Supervising staff, EHS officer and safeguards specialists	Contractor
Construction, Labour Camp, storage yard Management	Construction, Labour Camp, storage yard Management	As per SEMP	Weekly	EHS officer, Environment Specialist of consultant	Contractor
Solid waste management	Construction, Labour Camp, storage yard Management	As per SEMP	Weekly	EHS officer, Environment Specialist of consultant	Contractor
Construction and demolition waste management	All construction site	As per SEMP and applicable rules and regulations	Weekly	EHS officer, Environment Specialist of consultant	Contractor
Consent to establish of STP, batching plants, crusher, hot mix plant. DG sets etc.	STP, batching plants, crusher, hot mix plants etc	Copies of Consents	Periodically	EHS officer, Environment Specialist of consultant	No cost required for monitoring cost for obtaining CTE/CTO from PMU and for others from Contractor
Ambient air quality	6 locations (STP-1, SPS-1, CWR-1, CWPS-2, Pipe laying-1) during construction)	PM ₁₀ , PM _{2.5} , NO ₂ , SO ₂ , CO	Quarterly except Monsoon period	Contractor	Contractor
Ambient noise	6 locations (STP-1, SPS-1, CWR-1, CWPS-2, Pipe laying-1) during construction)	Day time and night time noise levels	Quarterly	Contractor	Contractor
Ground Water quality	5 locations	pH, TDS, Total Hardness, Zn,	Quarterly except	Contractor	Contractor

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost Source & of Funds
	STP-1, SPS-1, CWR-1, CWPS-2) during construction	Chloride, Iron, Copper, DO, Manganese, Sulphate, Nitrate, Fluoride, Hg, Cadmium, Cr ⁺⁶ , Arsenic, Lead, Total Alkalinity, Phosphate, Phenolic compound	Monsoon period		
Soil quality	5 locations STP-1, SPS-1, CWR-1, CWPB-2) during construction	pH, Elect. Conductivity (at 25°C), Moisture (at 105°C), Texture (silt, clay, sand), Calcium (as CaO), Magnesium (as Mg), Permeability, Nitrogen (as N), Sodium (as Na), Phosphate (as PO ₄), Potassium (as K), Organic Matter, oil and grease	Quarterly except Monsoon period	Contractor	Contractor

Environmental Monitoring in Construction Period

Proposed sites	Ambient Air quality	Ambient Noise quality	Ground Water Quality	Soil Quality
Pipe laying site within the town preferably near sensitive receptor*	1	1	Nil	Nil
STP (3.6 MLD) site	1	1	1	1
SPS site	1	1	1	1
CWR	1	1	1	1
CWPHs	2	2	2	2
Total number of samples in each quarter (A)	6	6	5	5
Total number of samples in construction period (B)	54	54	45	45

Table 25: Environmental Monitoring Plan of Anticipated Impacts during Operation

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
Monitoring of raw sewage quality	Inlet of the STP	Suspended solids, pH, Temperature Oil and grease, Total residual chlorine,	As per O&M Plan	O&M Contractor/Nagar Palika	O&M Contractor/Nagar Palika

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
		Ammonical nitrogen (as N), BOD, COD, Nitrate Nitrogen The values should be within the limit specified by CPCB to discharge into municipal sewers			
Monitoring of treated effluent quality	Outlet of STP	pH, BOD, COD, TSS, NH ₄ -N, N-total, Fecal Coliform	As per O&M Plan	O&M Contractor/Nagar Palika	O&M Contractor/Nagar Palika
Monitoring of plantations	Plantations locations	Nos. of tree survived	monthly	O&M Contractor/Nagar Palika	O&M Contractor/Nagar Palika
Sewer network to sustain operational efficiency and avoid clogging and early occurrence of leakages	Sewer network	to be included in the O&M plan prepared under the project	as per O&M plan	O&M Contractor/Nagar Palika	O&M Contractor/Nagar Palika
Consent to operate (CTO) from RSPCB	STPs	CTO should be renewed before expired	5 yearly	Sagwara Nagar Palika/PHED	Sagwara Nagar Palika, PHED
Reuse of treated effluent and safe disposal	STP outlet	Treated effluent is being used in agriculture or other gainful purposes	Continuously	O&M Contractor/Nagar Palika	O&M Contractor/Nagar Palika
Sludge Reuse and safe disposal	Sludge Management	Sludge is being gainfully used	Continuously	O&M Contractor/Nagar Palika	O&M Contractor/Nagar Palika
Monitoring of quality of water supplied to consumers	Consumer end-random sampling in all zones	As per CPHEEO norms	Daily	O&M Contractor	DBO contractor Cost
Pipeline network to sustain operational efficiency and avoid early occurrence of leakages	Pipeline network	to be included in O&M plan prepared under the project	Daily/when required	O&M Contractor	DBO contractor Cost
Reduction of NRW	Pipe line networks	As per RUDSICO-EAP norms	Daily/when required	O&M Contractor	DBO contractor Cost

B. Institutional Arrangements

237. The Local Self Government Department (LGSD) is the executing agency which is responsible for the overall strategic guidance and ensure the compliance with ADB loan

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

238. 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.

239. 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.

240. 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.

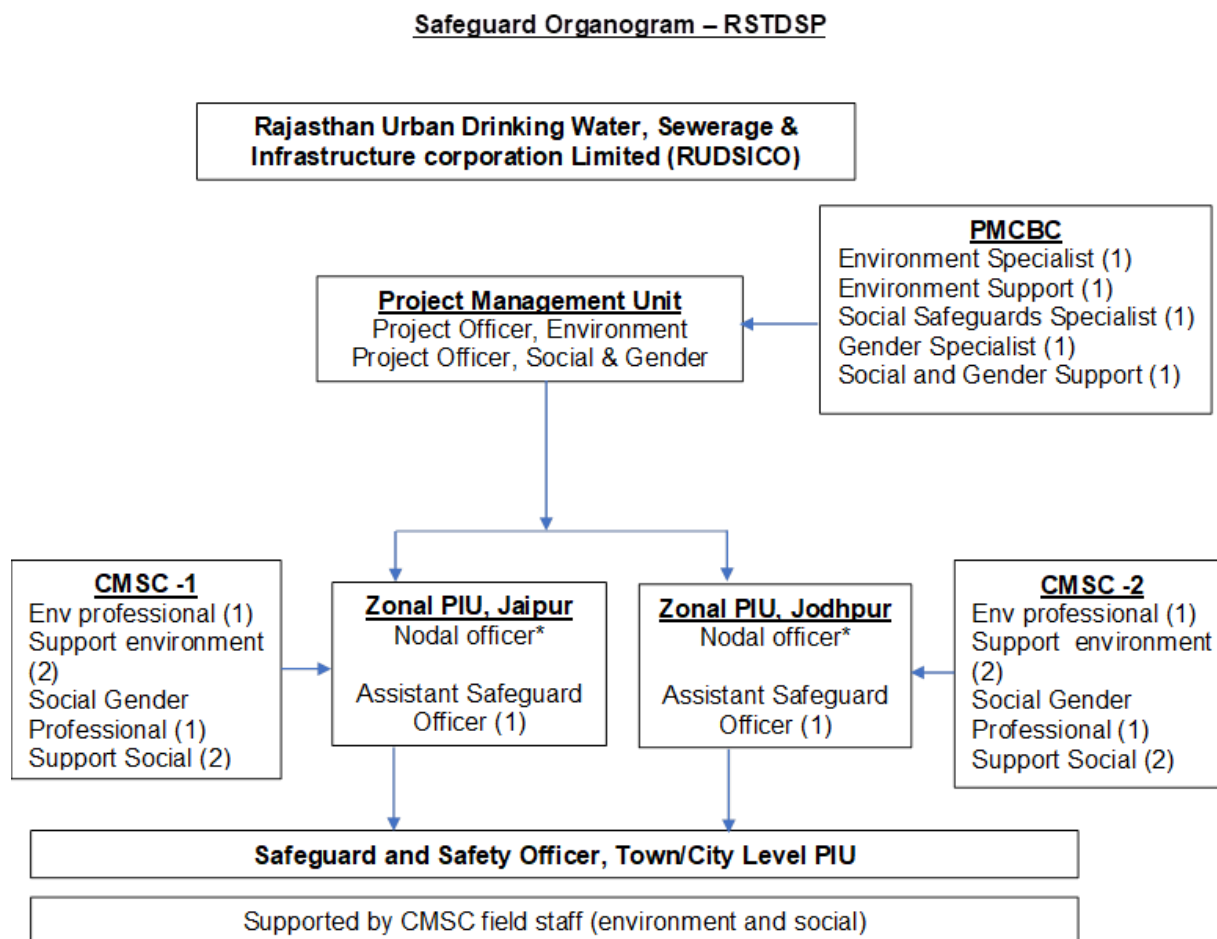
241. **Construction management and supervision consultants (CMSCs)** - 2 nos. of CMSCs at Jaipur and Jodhpur units are already established. They shall directly support PIUs in day to day contract management, construction supervision including quality management of ongoing works etc. This shall include work measurement, quantities, verification of bills of contractors etc. In compliance with the EMP, the CMSCs shall develop a strategy to overcome the difficulties of construction/traffic management in narrow streets and also prepare detailed plans for detour of traffic during excavation for pipe laying. The CMSC will propose and implement mechanism for coordination among all stakeholders such as traffic police, roads department, user committees, etc., for smooth construction execution. Adequate measures shall be taken for working near physical cultural resources involving close coordination with the Department of Archaeology. The CMSC will lead design of surveys and investigations required for the protection of archaeological sites/heritage areas and prepare Archaeological Impact Assessments, or other agreed upon document to be approved by the Department of Archaeology for the archaeologically sensitive locations.

242. **Community awareness and public participation consultants (CAPPC)**- CAPC core unit is already established at PMU, Jaipur and at fields in ongoing 14 project towns. CAPC field team will be established in upcoming project towns after PIUs are formed in new towns. CAPC will closely work in the field (with PIUs) to facilitate creation of project awareness and ensuring

public participation for all project works at the community level. This shall mainly involve house connections for water supply, sewerage and metering. CAPPC shall also undertake various IEC activities to promote and pursue health and hygiene among the communities.

243. **Figure 22** shows Environmental Safeguards Implementation Arrangements within RUDSICO-EAP and **Table 26** and **27** summarize the institutional responsibility of environmental safeguards implementation at all stages of the project.

Figure 22: 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.

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

enumerated in **Table 27**.

245. 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.

246. **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.

247. 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 27**.

248. **Town/City Level Project Implementation Unit.** The town-level PIUs shall be responsible for the quality of works executed under the project and will be guided by the zonal PIUs. The city/town PIUs will be responsible for implementation of the IEE. The town-level PIUs will be headed by a project manager (executive engineer or assistant engineer) and supported by CMSC field staff. Environment Safeguard Professional of CMSCs will assist PIUs in implementation of environmental safeguard. At each PIU, the Assistant Project Manager will be given additional responsibilities of safeguard tasks and will be designated as safeguard and safety officer (SSO). The SSO will be assisted by the social and gender specialist and environment specialist of CMSC in reviewing updated/revised IEEs, etc. They will also be responsible for coordination of field level activities related to safeguards conducted by the DBO contractor and CMSC. Key responsibilities of the town-level environment specialist are enumerated in **Table 27**.

249. **Contractors.** The contractor will be required to update the IEE and will be responsible for providing final design (including pipe alignments) to the supervision consultant for finalization/updating of resettlement plan. The contractor shall appoint an environment, health and safety (EHS) engineer who will be responsible on a day-to-day basis for (i) ensuring implementation of EMP, (ii) coordinating with the town-level PIUs and environment specialists of project consultant teams; (iii) community liaison,²⁸ consultations with interested/affected people, (iv) field-level grievance redress; and (iv) reporting.

250. 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

²⁸ 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.

for SEMP implementation. No works can commence prior to approval of SEMP.

251. 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.

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

Table 27: 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 labor standards, (d) OH&S, (e) EMP implementation especially spoil management, working in congested areas, public relations and ongoing consultations, grievance redress, etc.	(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	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
	(vii) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs (viii) Organize an induction course for the training of contractors preparing them on EMP implementation, environmental monitoring requirements related to mitigation measures; and taking immediate actions to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation. (ix) Ensure compliance with all government rules and regulations regarding site and environmental clearances as well as any other environmental requirements (x) Assist PMU, PIUs, and project NGOs to document and develop good practice construction guidelines to assist the contractors in implementing the provisions of IEE. (xi) Assist in the review of the contractors' implementation plans to ensure compliance with the IEE.	on mitigation measures involving the community and affected persons and ensure that environmental concerns and suggestions are incorporated and implemented	
PIU, Safeguard and Safety Officer (SSO)	(i) Ensure IEE is included in bid documents and contract agreements. Ensure cost of EMP implementation is provided. (iv) Disclose of approved EIAs/IEEs. (v) Obtain all necessary clearances, permits, consents, NOCs, etc. Ensure compliance 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	(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,	(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
	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.	(vi) conduct continuous public consultation and awareness; (vii) address any grievances brought about through the grievance redress mechanism in a timely manner as per the IEEs; and	
Consultant – 1.PMCBC-Environmental Safeguard Specialist – 1 no. Asbestos Expert – 1no. Heritage Expert – 1no. Biodiversity Expert – 1no.	(i) Review IEE/EMP submitted by CMSC and revise report to submit to PMU (ii) Assist PMU and PIU in obtaining all necessary clearances, permits, consents, NOCs, etc. Ensure provisions and conditions are incorporated in the IEE and detailed design documents. (iii) Assist in ensuring IEE is included in bid documents and contract agreements. (iv) Assist in determining adequacy of cost for EMP implementation. (v) Assist in addressing any concern related to IEE and EMP. (vi). Conduct specific assessment requirements	(i) Monitor EMP implementation (ii) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs.	
Consultant- 2. CMSC- 2 nos. Environmental safeguards professional	(i) Update initial environmental assessment for proposed project using REA checklists and submit to PIU/PMCBC (ii) Assist in summarizing IEE and translating to language understood by local people.	Monitoring of Implementation of EMP at site by contractor Recommend corrective action measures for non-compliance by contractors Assist in the review of monitoring reports submitted by contractors (iv) Assist in the preparation of monthly monitoring reports conduct continuous public consultation and awareness;	(i) Assist in the inspection and verification of contractor's post-construction activities.
Contractors (EHS Engineer)	(i) Review the IEE and provide information about changes needed as per revised design and scope of works to ESS of PMCBC for final revision of IEE (ii) Prepare EHS plan and take approval from CMSC/PIU and	(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	(i) Ensure EMP post-construction requirements are satisfactorily complied (ii) Request certification from PIU

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

1. Capacity Building and Development

253. 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.

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

255. 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 28.

Table 28: Capacity Building Program on EMP Implementation

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

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

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

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

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

259. 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.

260. 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.

261. 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.

C. EMP Implementation Cost

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

so this also does not need to be duplicated here. Cost for the capacity building program is included as part of the project. Regardless of these, project specific costs of mitigation by the construction contractors are included in the EMP budget for the civil works are enumerated here (**Table 29**).

Table 29: 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	78	4050	2,43,000	Civil works cost
	Subtotal (A)					2,43,000	
B.	Monitoring Measures						
1	Air quality monitoring**	Pre-construction and Construction (quarterly)	per sample	54	4920	265,680	Civil works cost
2	Noise levels monitoring**	Pre-construction and Construction (quarterly)	Per sample	54	1980	106,920	Civil works cost
3	Groundwater quality**	Pre-construction and Construction (quarterly)	per sample	45	6720	302,400	Civil works cost
4.	Soil quality**	Pre-construction and Construction (quarterly)	per sample	45	5880	264,600	Civil works cost
	Subtotal (B)					939,600	
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	5000	111	555,000	Civil works cost
2	Rainwater Harvesting for water conservation	Construction at proposed STP sites	Nos.	1	Lump Sum	450,000	Civil works cost
3	Implementation of Asbestos	Construction-Inventory	Lumpsum		-	7,000,000	Civil works cost

	Particulars	Stages	Unit	Total Number	Rate (INR)	Cost (INR)	Costs Covered By
	Management Plan	Testing Overall Supervision for Asbestos Removal Storage Transportation Disposal / Treatment Documentation and Reporting					
4	Barricading						
	Providing and fixing Barricading using 40 mm dia M.S. pipe vertical and horizontal posts	Construction	m	74,483	50	3,724,150	Civil works cost
	Providing and fixing using 40 mm dia M.S. pipe ("B" class) as vertical post and PVC tape	Construction	m	74924	38.50	28,84,574	Civil works cost
	MS Pipe with nut and bolt and GI corrugated sheets	Construction	Sq.m.	29309	101	29,60,209	Civil works cost
	Sub Total (D)					95,68,933	
E	Grievance Redressal Mechanism				Lump sum	350,000	Civil works cost
	Sub Total (F)					350,000	
	Total (A+B+C+D+E+F)				INR	114,26,533	

* In preliminary design about 11 trees may be required to cut. During detail design DBO contractor will be required to confirm exact number of tree cutting. Tree cutting requirement for pipeline works can be decided only after confirmatory survey of full length of alignment by contractor. At this stage higher side of tree cutting numbers are taken as 15 trees. As per RUDSICO-EAP policy; compensatory plantation in the ratio of 1:3 is to be followed during construction works. Therefore 45 numbers of trees are taken as compensatory plantation within STP campus to reduce foul smell and 15 numbers of trees are taken for plantation around 1 SPS.

** As per table 30

Summary of EMP Cost incurred by Institution :

Contractor Cost - INR 111,51,533

PMU Cost - INR 275,000

Total - INR 114,26,533

(In Words: Rupees One Crore Fourteen Lakhs Twenty-Six Thousand Five Hundred and Thirty Three only)

Table 30: Details of environment monitoring locations

Project components where environmental monitoring is required	Total numbers of environmental monitoring required in one quarter	Total numbers of environmental monitoring required in year (tree quarters leaving quarter of monsoon)	Project duration	Total number of environmental monitoring required during project duration
STP-1 SPS-1 CWR-1 CWPH-2 WS/WW networks-1 Total- 6 Locations	Air- 6 Noise- 6 Ground Water- 5 Soil- 5	Air- 18 Noise- 18 Ground Water- 15 Soil- 15	3 years	Air- 54 Noise- 54 Ground Water- 45 Soil- 45

VI. CONCLUSION AND RECOMMENDATION

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

264. Presently source of Water at Sagwara town is surface water from Lodeshwar Dam. The town is benefited from 6 no. of tube wells at various locations in the city. These tube wells are directly feed in distribution system. Total water abstracted from Tube Wells is negligible and from Lodeshwar dam is 4.46 MLD. Existing Water supply in Sagwara town is intermittent. There are 7 No's of OHSR/GLSR located in Sagwara town. The capacity of the OHSRs and GLSRs is 100 KL to 600 KL. Gross water supply rate is over 70 litres per capita per day (LPCD), the water received at consumer end is about 60-70 LPCD only, which is less than standard of 135 LPCD. This is due to heavy losses in the existing distribution network about 20-40%. Presently about 70-80% area of municipality limit is covered under the drinking water supply scheme by ULB. Remaining area which is newly developed and newly added to the municipality area is still unconnected with piped scheme and will be considered under this proposal.

265. At present, there is no sewerage system is in place in Sagwara. Presently the wastewater from kitchens & bathrooms is discharged into storm water drains culminating finally to the Nallah or on ground, which pollutes the environment and contaminates the ground water. Open defecation is not uncommon. Most of the residential and commercial buildings and educational institutions have on-site septic tanks and soak pits. Though septic tanks are an accepted onsite treatment, as the septic tanks are not designed and maintained properly, the effluent does not confirm to the standards. The effluent from the septic tanks is directly let into the open drains.

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

267. Proposed site of STP are located away from habitation areas. However, there are 11 trees at this location which may need to be cut during construction. Adequate compensatory afforestation measures are being proposed under the project to counter the tree-cutting activity. Also, It is proposed to reuse the treated effluent for use in agriculture, horticulture, development of urban forestry etc. and remaining treated effluent is proposed to be discharged in to a nearby drains or vacant govt. lands. In order to achieve recommended standards it is proposed to achieve very low BOD (BOD 10) and suspended solids in the treated effluent from proposed STPs.

268. At the STP, sewage sludge will be removed continuously from reactors, and solidified

using decanter, and stored in sludge drying beds for a period of 7-15 days. The treatment and drying processes kill enteric bacteria and pathogens. Because of its high content of nitrates, phosphates and other plant nutrients the sludge can be used as organic fertilizer.

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

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

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

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

273. 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.

274. 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.

275. 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.

276. The project will benefit the general public by contributing to the long-term improvement of water supply and sewerage system and community liveability in Sagwara. 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.

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

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

- (i) Obtain all statutory clearances at the earliest time possible and ensure conditions/provisions are incorporated in the detailed design;
- (ii) PMU to ensure that the construction of WTP and other associated project components are completed on time, and are in operation prior to completion of civil works under this subproject
- (iii) PMU to ensure adequate treatment capacity and treatment efficiency of WTP meeting National standards in compliance with government regulations.
- (iv) Include this IEE in bid and contract documents;
- (v) Commitment from PMU, PIUs, project consultants, and contractors to protect the environment and the people from any impact during project implementation
- (vi) Update/revise this IEE based on detailed design and/or if there are unanticipated impacts, change in scope, alignment, or location;
- (vii) Update and implement the asbestos management plan per site-specific conditions;
- (viii) Conduct safeguards induction to the contractor upon award of contract;
- (ix) Ensure that sludge management protocols are compliant with environmental regulations (Solid Waste Management Rules 2000 and its amendments) and solid waste disposal should have a designated site (dumping on vacant lot is not allowed);
- (x) Ensure contractor appointed qualified environment, health and safety (EHS) officers prior to start of works;
- (xi) Timely disclosure of information and establishment of GRM;
- (xii) Involvement of contractors, including subcontractors, in first level GRM;
- (xiii) Strictly supervise EMP implementation;
- (xiv) Continuous consultations with stakeholders;
- (xv) Documentation and reporting on a regular basis as indicated in the IEE.

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)/Sagwara Water Supply and Wastewater Project, Distt. Dungarpur, Rajasthan
Sector Division: *Urban Development*

REA Checklist- Sewerage

SCREENING QUESTIONS	Yes	No	REMARKS
A. Project Siting Is the project area...			
Densely populated?	√		Subproject activities are scattered to entire town including the densely populated areas.
Heavy with development activities?	√		Sagwara is a developing town with continuous urban expansion, there are no major industries and mostly agriculture, business and service are the common occupations
Adjacent to or within any environmentally sensitive areas?		√	There are no environmental sensitive areas near the proposed sites.
Cultural heritage site		√	There are no any cultural heritage site in Sagwara
Protected Area		√	
Wetland		√	
Mangrove		√	
Estuarine		√	
Buffer zone of protected area		√	
Special area for protecting biodiversity		√	
Bay		√	
Potential Environmental Impacts Will the Project cause...			
Impairment of historical/cultural monuments/areas and loss/damage to these sites?		√	In Sagwara, there no any historical/cultural monuments/areas

SCREENING QUESTIONS	Yes	No	REMARKS
Interference with other utilities and blocking of access to buildings; nuisance to neighboring areas due to noise, smell, and influx of insects, rodents, etc.?	√		Construction work may interfere with the water supply, power and communication lines. Access to houses and business may be affected during pipe laying works. Construction works may cause nuisance to public in form of traffic disturbance, utility disruption, increased noise and air pollution. Proposed STP sites are located away from inhabited areas. Adequate green buffer around the site will be provided to minimize the nuisance due to bad odor, if any.
dislocation or involuntary resettlement of people		√	Project does not involve land acquisition / involuntary resettlement /displacement. During the sewer construction, particularly in narrow streets there may be temporary disruption to household and there will also be temporary loss of livelihood to roadside vendors, the same is addressed in the Resettlement Plan.
disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	
Impairment of downstream water quality due to inadequate sewage treatment or release of untreated sewage?		√	Treated water shall not be disposed into any surface water source. Nevertheless, there is proposal of reuse of treated effluent from STP and unused treated effluent shall be discharged in to nearby land or drains, therefore treated effluent needs to meet prescribed standards set by the Central Pollution Control Board (CPCB).
Overflows and flooding of neighboring properties with raw sewage?		√	Raw sewage shall not cause any flooding and overflowing and will be ensured through regular operation and maintenance.
Environmental pollution due to inadequate sludge disposal or industrial waste discharges illegally disposed in sewers?	√		Inadequate sludge disposal may cause environmental pollution (soil and Water) This sewerage system will cater only domestic wastewater, no industrial wastewater discharge is allowed into the sewerage system. As a precaution, ULB should take responsibilities that wastewater from industrial units should not be allowed into sewers.
Noise and vibration due to blasting and other civil works?		√	Blasting for underground works is prohibited in RUDSICO-EAP works

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

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

REA Checklist- Water Supply

SCREENING QUESTIONS	Yes	No	REMARKS
Water Supply			
Project Siting Is the project area-			
Densely populated?	√		Some part of the city is densely populated, whereas outer area is less dense. Water supply is proposed in all town including densely populated areas of town
Heavy with development activities?	√		Sagwara is a developing town; urban expansion is considerable
Adjacent to or within, any environmentally sensitive areas?		√	
Cultural heritage site	√		There are no any cultural heritage site in Sagwara
Protected Area		√	
Wetland		√	
Mangrove		√	
Estuarine		√	
Buffer zone of protected area		√	
Special area for protecting biodiversity		√	
Bay		√	
Potential Environmental Impacts Will the Project cause...			
Pollution of raw water supply from upstream wastewater discharge from communities, industries, agriculture, and soil erosion runoff?		√	A new water source of Beneshwar Dam will be used for proposed water supply, from there treated water (from WTP) shall be provided for proposed water supply of Sagwara under RSTSP. There will be no pollution of raw water supply from upstream wastewater discharge from communities, industries, agriculture, and soil erosion runoff.
Impairment of historical/cultural monuments/areas and loss/damage to these sites?		√	There are no any historical/cultural monuments/areas in Sagwara town
Hazard of land subsidence caused by excessive ground water pumping?		√	No new ground water source will be used for proposed water supply
Social conflicts arising from displacement of communities?		√	Project does not involve land acquisition /displacement. No social conflicts envisaged
Conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?		√	A new water source of Beneshwar Dam will be used for proposed water supply, from there treated water (from WTP) shall be provided for proposed water supply of Sagwara under RSTSP. This dam will exclusively be used for water supply, therefore there will be no conflict in abstraction of raw water for water supply
Unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?	√		There may be chances of excessive pathogens or mineral constituents in the proposed raw water source i.e. Beneshwar dam. Adequate treatment shall be done by PHED and treated water shall be supplied for water supply works proposed in Sagwara under RSTDSP

Delivery of unsafe water to distribution system?		√	Adequate treatment shall be done by PHED and treated water shall be supplied for water supply works proposed in Sagwara under RSTDSP. Further chlorination shall be done in CWR before supply of water to residents. Hence, there are no chances of delivery of unsafe water to the distribution system
Inadequate protection of intake works or wells, leading to pollution of water supply?		√	No intake works or wells are proposed
Over pumping of ground water, leading to salinization and ground subsidence?		√	No any new Ground water pumping will be done for water supply
Excessive algal growth in storage reservoir?	√		Periodical maintenance regime should be followed during O&M period to check algal growth in the system
Increase in production of sewage beyond capabilities of community facilities?		√	Construction of one new STP and its networks is proposed under RSTDSP works. Sewerage system has been designed keeping in mind for future waste water discharge from residences
Inadequate disposal of sludge from water treatment plants?		√	No new WTP is proposed in RSTDSP works.
Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and protect facilities?		√	Proposed site for pumping station is demarcated with boundary wall and away from habitations
Impairments associated with transmission lines and access roads?		√	Old transmission lines will be replaced with new transmission line on existing ROWs therefore no such problem will emerge
Health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.	√		Adequate design of chlorination system will be required under the project
Health and safety hazards to workers from handling and management of chlorine used for disinfection, other contaminants, and biological and physical hazards during project construction and operation?	√		Adequate safety measures will be required for chlorination system
Dislocation or involuntary resettlement of people		√	There is no resettlement of people for project implementation. Only temporary livelihood impacts are anticipated for which Resettlement Plan is also prepared for temporary impacts on vendors
disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	No such impact is envisaged

Noise and dust from construction activities?	√		All the construction machineries employed should comply with noise emission standards of Central Pollution Control Board. Dust suppression measures such as water sprinkling will be employed
Increased road traffic due to interference of construction activities?	√		Excavation and laying pipelines along public roads will interfere with the traffic. Construction material transport will increase traffic within city. Proper traffic management and construction planning will be ensured to minimize the interference
Continuing soil erosion/silt runoff from construction operations?	√		Construction work during monsoon shall be carried out with due care so that silt run off due to construction operation is prevented. No construction will be allowed during rains.
Delivery of unsafe water due to poor O&M treatment processes (especially mud accumulations in filters) and inadequate chlorination due to lack of adequate monitoring of chlorine residuals in distribution systems?	√		There is possibility of delivery of unsafe water due to poor O&M of storage and distribution facilities. O&M contractor has to ensure the quality of water to be supplied. Penalty provisions should be made in O&M contract for delivery of unsafe drinking water
Delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?		√	Not envisaged, pipes of corrosion free materials (PVC pipes) shall be used in the project and provision should be made in designs
Accidental leakage of chlorine gas?	√		Chlorination is proposed in CWR, though there may be negligible chances of leakage of Chlorine gas and mitigation measures will be required in this process.
Excessive abstraction of water affecting downstream water users?		√	Raw water shall be taken from Beneshwar Dam by PHED and treated water shall be supplied for Sagwara Water Supply project under RSTDSP.
Competing uses of water?		√	Raw water shall be taken from Beneshwar Dam by PHED and treated water shall be supplied for Sagwara Water Supply project under RSTDSP.
Increased sewage flow due to increased water supply		√	Sewerage system is also proposed for whole town considering increased water supply under RSTDSP
large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		√	Most of the unskilled workers will be hired locally, some of skilled workers will be brought from outside but numbers will not so large to have impacts on social infrastructure and services
Social conflicts if workers from other regions or countries are hired?		√	The contractor will be utilizing the local labour force as far as possible; in case if it is unavoidable, labour camps and facilities will be provided appropriately. No conflicts envisaged
risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?		√	No explosives shall be used in project. Fuel and other chemicals will be used in very less quantities which will not have significant impact on community health and safety. Safe handling of fuels and chemicals will be ensured by contractor.

community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	√		Community safety risk may be there during construction during excavation for pipe laying, equipment and vehicle operation, construction of CWRs, OHSRs, pump houses etc. for which mitigation measures will be required by contractor
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Checklist for Preliminary Climate Risk Screening

Country/Project Title: India/Rajasthan Secondary Towns Development Investment Program (RSTDP), Sagwara Water Supply and Sewerage Project, District Dungarpur, Rajasthan

Sector :Urban Development

Subsector: Water Supply and Sewerage

Division/Department: SARD/SAUW

Screening Questions		Score	Remarks ²⁹
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	0	No such issue may affect the project
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	No such issue may affect the project
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	No such issues may affect the project
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	0	No such issue may affect the project
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	No problem will envisaged in future which likely affect the performance of project output

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

²⁹ 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.

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 one STP, CWRs and pump houses along with water supply and sewerage networks and the anticipated environmental impacts are very marginal and the construction activity does not impose any threat to the existing climatic conditions.

Appendix 2: Stakeholders Consultations 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 RSTDSP. Details of these consultations are given below-

Public Consultations During December 2021

S.No	Date	Location and name of persons	Topic Discussed	Outcome
1	27.12.2021	Near STP Site, Sagwara Male: 5 Female: 9 Total-14	• Project components under RSTDSP and the benefits to the community • Grievance redressal mechanism under the project. • Present Status of Water Supply and Waste Water services in town • Presence of any forest, wild life or any sensitive/unique environmental components nearby the project, • Presence of historical/ cultural/ religious sites nearby. • Unfavourable climatic condition • Willingness to Reuse the STP treated water. • Status of land and present vegetation at proposed land, reuse of treated effluent from STP	• Grievance mechanism and process of loading complaints briefed with participants. • It was also informed by habitations that water supply is being provided by PHED but it's intermittent on alternate days and quality of water is also not good. Sewerage facility is not available in the town; most of households having their own Septic tanks or soak pits. • No wildlife present at proposed STP site • Participants are happy with proposed project. • There is not any forest, wildlife or any sensitive /unique environmental, component near the project area. • There are not any historical/cultural and religious sites in nearby the subproject area • Weather is Sagwara is comfortable up to April and becomes hot from May to July, rains are normal to heavy
2	27.12.2021	Galiyakot Road, Punarwas Colony Male: 2 Female: 3 Total- 5	• Project components under RSTDSP and the benefits to the community • Grievance redressal mechanism under the project.	• Grievance mechanism and process of loading complaints briefed with participants. • It was also informed by habitations that water supply is being provided by PHED but it's intermittent on alternate days and quality of water is also not good. Sewerage facility is not

S.No	Date	Location and name of persons	Topic Discussed	Outcome
			• Present Status of Water Supply and Waste Water services in town • Dust and noise pollution and disturbances during construction work. • Perception of villagers on tree felling and afforestation • Safety of residents during construction phase and applying of vehicle for construction activities • Status of land and present vegetation at proposed land, reuse of treated effluent from STP.	available in the town; most of households having their own Septic tanks or soak pits. • Participants are happy with proposed project • The contractor should take care of the safety arrangement during construction phase and should provide traffic diversion routes to avoid the vehicle congestion • People should be made aware before start of work in particular area. • Water sprinkling should be done during construction works to reduce dust. People are not having problem from construction noise
3	27.12.2021	Ward no. 18 & 19 Male: 2 Female: 4 Total- 6	• Project components under RSTDSP and the benefits to the community • Grievance redressal mechanism under the project. • Present Status of Water Supply and Waste Water services in town • Presence of any forest, wild life or any sensitive/unique environmental components nearby the project, • Presence of historical/ cultural/ religious sites nearby. • Willingness to Reuse the STP treated water. • Status of land and present vegetation at proposed land,	• Grievance mechanism and process of loading complaints briefed with participants. • It was also informed by habitations that water supply is being provided by PHED but it's intermittent on alternate days and quality of water is also not good. Sewerage facility is not available in the town; most of households having their own Septic tanks or soak pits. • Participants are happy with proposed project and are willing to pay for improved quality of water and sewerage services. • There is not any forest, wildlife or any sensitive /unique environmental, component near the project area. • There are not any historical/cultural and religious sites in nearby the subproject area

Photographs of Public Consultations



Consultation Attendance sheets

Attendance Sheet

Place: Surat Date: 27/12/2021

Topic/Issue Discussed: COVID-19

S. no.	Name	Occupation	Mobile Number	Signature
1	સુરેશ			
2	મુકેશ			
3	મુકેશ			
4	મુકેશ			
5	મુકેશ			
6	મુકેશ			

Attendance Sheet

Place: STATION, KATKI ST. N. 14 Date: 27.12.2021

Topic/Issue Discussed: ଶିକ୍ଷାଗତ କାର୍ଯ୍ୟ ସମୀକ୍ଷା

S. no.	Name	Occupation	Mobile Number	Signature
1	ଶ୍ରୀମତୀ ହେମା ଜି.		9952 41841	ଶ୍ରୀମତୀ
2	ଶ୍ରୀମତୀ ସୁମିତ୍ରା			ଶ୍ରୀମତୀ
3	ଶ୍ରୀମତୀ			ଶ୍ରୀମତୀ
4	ଶ୍ରୀମତୀ ସୁମିତ୍ରା			ଶ୍ରୀମତୀ
5	ଶ୍ରୀମତୀ			ଶ୍ରୀମତୀ
6	ଶ୍ରୀମତୀ		919342541	ଶ୍ରୀମତୀ
7	ଶ୍ରୀମତୀ		942311522	ଶ୍ରୀମତୀ
8	ଶ୍ରୀମତୀ		923043445	ଶ୍ରୀମତୀ
9	ଶ୍ରୀମତୀ		9329433040	ଶ୍ରୀମତୀ
10	ଶ୍ରୀମତୀ		9271123044	ଶ୍ରୀମତୀ
11	ଶ୍ରୀମତୀ			ଶ୍ରୀମତୀ
12	ଶ୍ରୀମତୀ		9124632377	ଶ୍ରୀମତୀ
13	ଶ୍ରୀମତୀ		9852463712	ଶ୍ରୀମତୀ
14	ଶ୍ରୀମତୀ		9728307204	ଶ୍ରୀମତୀ

Consultation Sheet

Place: STATION, KATKI ST. N. 14 Date: 27.12.2021

Topic/Issue: ଶିକ୍ଷାଗତ କାର୍ଯ୍ୟ ସମୀକ୍ଷା

S.no	Name	Occupation	Mobile no.	Signature
1	ଶ୍ରୀମତୀ ହେମା ଜି.	ଶିକ୍ଷକ	983210180	ଶ୍ରୀମତୀ
2	ଶ୍ରୀମତୀ ସୁମିତ୍ରା	ଶିକ୍ଷକ		ଶ୍ରୀମତୀ
3	ଶ୍ରୀମତୀ	ଶିକ୍ଷକ	944492104	ଶ୍ରୀମତୀ
4	ଶ୍ରୀମତୀ	ଶିକ୍ଷକ	937646822	ଶ୍ରୀମତୀ
5	ଶ୍ରୀମତୀ	— " —		ଶ୍ରୀମତୀ
6	ଶ୍ରୀମତୀ	— " —		ଶ୍ରୀମତୀ
7	ଶ୍ରୀମତୀ	— " —		ଶ୍ରୀମତୀ
8	ଶ୍ରୀମତୀ	— " —		ଶ୍ରୀମତୀ
9	ଶ୍ରୀମତୀ	— " —	9282181714	ଶ୍ରୀମତୀ
10	ଶ୍ରୀମତୀ	— " —		ଶ୍ରୀମତୀ
11	ଶ୍ରୀମତୀ	— " —		ଶ୍ରୀମତୀ
12	ଶ୍ରୀମତୀ	— " —		ଶ୍ରୀମତୀ
13	ଶ୍ରୀମତୀ	ଶିକ୍ଷକ	9852463712	ଶ୍ରୀମତୀ
14	ଶ୍ରୀମତୀ	ଶିକ୍ଷକ		ଶ୍ରୀମତୀ

Public Consultations During April 2022 with ST Community

Date and Location	Participants			Topic Discussed	Outcome	Photographs
	Total	Male	Female			
07.04.2022 Ward No- 9 and 10, ST Community , Sagwada	06	02	04	• Present water supply and sewerage condition, access to water supply, quality of water supply, project components and the benefits to the community • Project components under RSTDSP and the benefits to the community and Grievance redressal mechanism under the project. • Presence of any forest, wild life or any sensitive/unique environmental components nearby the project, • Presence of historical/ cultural/ religious sites nearby. • Willingness to Reuse the STP treated water. • Status of land and present vegetation at proposed land	• The consultation/s was conducted specifically with the scheduled tribe community. • Some households do have individual water supply connection. Entire community could not afford domestic water supply connections due to (i) lack of funds to get the connection installed (ii) some households have constructed houses on land parcels without having land titles and hence not willing to take connections, (iii) have easy access to public water supply source and are not willing take individual connections. • Open defecation was/is practiced due to lack of individual toilets. Many have constructed toilets in the recent past availing subsidised schemes from the Municipality. • There is not any forest, wildlife or any sensitive /unique environmental, component near the project area. • There are not any historical/cultural and religious sites in nearby the subproject area	 

07.04.2022 Near Ward No-34, ST Community , Sagwada	07	00	07	• Present water supply and sewerage condition, access to water supply, quality of water supply, project components and the benefits to the community, • Project components under RSTDSP and the benefits to the community and Grievance redressal mechanism under the project. • Presence of any forest, wild life or any sensitive/unique environmental components nearby the project, • Presence of historical/cultural/ religious sites nearby. • Situation of open defecation in the area • Willingness to Reuse the STP treated water. • Status of land and present vegetation at proposed land	• Some households do have individual water supply connection. Entire community could not afford domestic water supply connections. • Women excited about the prospect of getting individual water connections. They opined that their energy, time and hard labour will be saved especially during summer months. Enquired if their area has been included under the project. The project team appraised that the entire town including their area in Ward 2 and 3 will be covered under proposed water supply network. • There is not any forest, wildlife or any sensitive /unique environmental, component near the project area. • There are not any historical/cultural and religious sites in nearby the subproject area • Open defecation was/is practiced due to lack of individual toilets. Many have constructed toilets in the recent past availing subsidised schemes from the Municipality.	
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07.04.2022 Ward No-21 and 35, ST Community, Sagwada	24	24	00	• Present water supply and sewerage condition, access to water supply, quality of water supply, project components and the benefits to the community, willingness to pay • Project components under RSTDSP and the benefits to the community and Grievance redressal mechanism under the project. • Dust and noise pollution and disturbances during construction work. • Perception of people on tree felling and afforestation • Willingness to Reuse the STP treated water. • Status of land and present vegetation at proposed land	• The consultation/s was conducted specifically with the scheduled tribe community. • Some households do have individual water supply connection. Entire community could not afford domestic water supply connections due to (i) lack of funds to get the connection installed (ii) some households have constructed houses on land parcels without having land titles and hence not willing to take connections, (iii) have easy access to public water supply source and are not willing take individual connections. • Open defecation was/is practiced due to lack of individual toilets. Many have constructed toilets in the recent past availing subsidised schemes from the Municipality. • People should be made aware before start of work in particular area. • Water sprinkling should be done during construction works to reduce dust. People are not having problem from construction noise	
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07.04.2022 Ward No-19, ST Community, Sagwada	05	05	00	• Present water supply and sewerage condition and access to water supply service. Quality and quality of water supply. • Project components under RSTDSP and the benefits to the community espically benefits to women, willingness to pay and GRM undet the project • Dust and noise pollution and disturbances during construction work. • Perception of people on tree felling and afforestation • Safety of residents during construction phase and applying of vehicle for construction activities • Willingness to Reuse the STP treated water. • Status of land and present vegetation at proposed land	• Some households do have individual water supply connection. Entire community could not afford domestic water supply connections. • Women excited about the prospect of getting individual water connections. They opined that their energy, time and hard labour will be saved especially during summer months. Enquired if their area has been included under the project. The project team appraised that the entire town including their area in Ward 19 will be covered under proposed water supply network. • Open defecation was/is practiced due to lack of individual toilets. Many have constructed toilets in the recent past availing subsidised schemes from the Municipality. • The contractor should take care of the safety arrangement during construction phase and should provide traffic diversion routes to avoid the vehicle congestion • People should be made aware before start of work in particular area. • Water sprinkling should be done during construction works to reduce dust. People	
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				are not having problem from construction noise	
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Consultations with Govt. Stakeholders

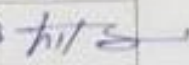
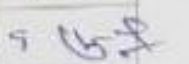
Date and Location	Participants			Topic Discussed	Outcome	Photographs
	Total	Male	Female			
07.04.2022 Nagar Palika, Sagwada	04	04	00	Proposed water supply works and availability of land, requirement of No objection etc	Meeting with PHED and Nagar Palika officials and discussion were done about proposed project under phase-4. PHED and Nagar Palika officers assured of their full cooperation with RUIDP/RSTDSP during planning and implementation of the project	
07.04.2022 Ward Councillors, Sagwada	14	09	05	Proposed water supply works and availability of land, R&R issues etc.	Meeting with ward councillors of Sagwara town were done about proposed project under phase-4. PHED and Chairman and ward councillors were assured of their full cooperation with RUIDP/RSTDSP during planning and implementation of the project	 

Public Consultations During April 2022 with ST Community

Attendance Sheets

Rajasthan Secondary Towns Development Sector Project (RSTDSP)
RUIDP Phase-IV
Consultation Sheet

Place Nagarkot Sagwara Date 7/04/2022
 Topic/Issue Related to proposed sewerage and water supply component and its impacts.

S.no	Name	Occupation	Mobile no.	Signature
1.	Mr. Mukesh Kumar Mohil	Executive officer (Nagarkot block)	9414618808	
2.	Mr. Mohan Lal Singh	Vice Chairman	9414566758	
3.	Mr. Lokesh Patidar	Junior Engineer	9461857375	

Rajasthan Secondary Towns Development Sector Project (RSTDSP)

RUIDP Phase-IV

Consultation Sheet

Place Ward No. 34, Sagwara Date 7/04/2022

Topic/Issue Woman consultation for Sewerage and Water Supply Project at Sagwara Town

S.no	Name	Occupation	Mobile no.	Signature
1	Laxmi Khazadiya	Housewife	-	
2	Meera Devi	"	-	
3	Nisha Akari	"	9950343004	
4	Kalpna Dandoo	"	-	
5	Kamla Gayman Kharedi	"	-	
6				
7				

Rajasthan Secondary Towns Development Sector Project (RSTDSP)

RUIDP Phase-IV

Consultation Sheet

Place Ward No. 19 - Sagwara Date 7/04/2022

Topic/Issue Public Consultation for Sewerage and Water Supply Project in Sagwara

S.no	Name	Occupation	Mobile no.	Signature
1.	Nabesh	Shopkeeper	9696100191	
2.	Shankarlal Tobiya	Labour	9001306396	
3.	Halish	Small Vendor	9340619119	
4.	Rohit Anand	"	9239110148	

Rajasthan Secondary Towns Development Sector Project (RSTDSP)

RUIDP Phase-IV

Consultation Sheet

Place: Chairman Office Nagal Palka Date: 07/04/2022
Sagwala
 Topic/Issue: Meeting held with Elected Ward Councilors
of N.P. Sagwala on proposed sub-project Sewerage and
Water Supply for Town Sagwala.

S.no	Name	Occupation	Mobile no.	Signature
1.	mohd. ismail $\frac{8}{12}$	Police Chairman Nagal Palka.	9014526988	
2.	Vinod parashar $\frac{2}{3}$	पार्श्व नगरपालिका	969080 2372	
3.	मेतना पालिका $\frac{20}{32}$	नगरपालिका	901343858	मेतना
4.	शरा आगरी $\frac{25}{33}$	नगरपालिका	84408574 29	शरा
5.	विशाल शर्मा $\frac{26}{34}$	नगरपालिका पार्श्व	93280919 60	
6.	मीना सेवक $\frac{21}{17}$	नगरपालिका पार्श्व	96026697 90	मीना सेवक
7.	सुमन ठापा $\frac{15}{24}$	नगरपालिका पार्श्व	9855054 706	सुमन ठापा
8.	बाबुलाल मालिक $\frac{19}{31}$	नगरपालिका पार्श्व	958722082	
9.	अमर शर्मा $\frac{7}{10}$	पार्श्व नगरपालिका	941396772	अमर
10.	अशोक शर्मा $\frac{1}{1}$	पार्श्व नगरपालिका	8250668383	अशोक शर्मा
11.	कुंदलाल मल्ल $\frac{14}{16}$	पार्श्व नगरपालिका	723209474	
12.	लालु बलारिया $\frac{16}{25}$	नगरपालिका पार्श्व	6376212151	

13. प्रदीप लाल शर्मा
 नगरपालिका - 9328528829
 प्रदीप

Rajasthan Secondary Towns Development Sector Project (RSTDSP)

RUIDP Phase-IV

Consultation Sheet

Place: Udaipur No. 25(Old)/35 (New)

Date: 04/04/2022

Topic/Issue: General Discussion about sewerage and
Water supply project for Ramnagar
(Dungarpur)

S.no	Name	Occupation	Mobile no.	Signature
1.	Santosh Dandoo	-	9602195319	[Signature]
2.	Lokesh Roy Bori	-	9742300331	[Signature]
3.	Ajay Dandoo	-	9742436309	[Signature]
4.	Shankar Khali	-	9636157268	[Signature]
5.	Ajay Khatun	-	8003558376	[Signature]
6.	SANTOSH DANDOO	-	9636272665	[Signature]
7.	[Signature]	-	9928731335	[Signature]
8.	Vijay Dandoo	-	9073661207	[Signature]
9.	[Signature]	-	9784195991	[Signature]
10.	Prem Sunkar	-	8003151529	[Signature]
11.	SHRUTI MAL	-	-	[Signature]
12.	KUNAL	-	8890036995	[Signature]

13	— दुगा	9982822	दुगा
14	मनोजडावी	9809271	मनोज
15	रमेश	917264048	रमेश
16	जयदेव	772691625	जयदेव
17	दीपक	982855785	दीपक
18	अशोक	774258931	अशोक
19	हरी	7891689844	हरी
20	अजय	7568754668	अजय
21	मनोज	7023361792	मनोज
22	दिनेश	9636397054	दिनेश
23	नाना	/	नाना
24	जय	9116320569	जय

Town leve consultation meeting. On 13 August 2022. a town level consultation was conducted in Sagwara Municipal office, Meeting was chaired by Municipal President Mr Narendra Khodania and Vice President Raju Mama Sheikh, local public, ward councillor of Sagwara municipality, Consultants from RUIDP and ADB Joined the meeting along with local persons. After meeting Mr Narendra Khodania briefed the locals about proposed project. Meeting was attended by 22 ward representatives, ULB officials, local public and Consultants from RUIDP.

RUIDP

CMSC-01, RUIDP

Attendance Sheet

Name of Project town: - SAGWARA Venue: - Nagarpalika, Sagwara Date: - 13/08/2022

Name of the Event/ Activity: - Sagwara Lakes & Playground Development in Sagwara.

Issues covered: -

1.....2.....

3.....4.....

S.No.	Name	Sex		Designation/Role	Contact No.	Signature
		Male	Female			
1	मुकुंदा पंवार	✓		पुत्री एवं महिला समी सागरिक	8890013889	<i>[Signature]</i>
2	सुमन गुप्ता	✓		पाविक	8000047350	<i>[Signature]</i>
3	व-दता शाह					
4	MOHAMMED PEETHA	✓		PARSHAD	9928660765	<i>[Signature]</i>
5	Ismael bilal	✓		Reza Khan	9824422541	<i>[Signature]</i>
6	श्यामल फारुख	✓		सदस्य	9001343856	<i>[Signature]</i>
7	अमोलक रेड	✓		पाविक	8290668383	<i>[Signature]</i>
8	मीना			पाविक	7374880239	<i>[Signature]</i>
9	दुर्गा शाह				9875054706	<i>[Signature]</i>
10	आमिर				9667175857	<i>[Signature]</i>
11	सलिन फारुख				9414566826	<i>[Signature]</i>
12						



CMSC-01, RUIDP Attendance Sheet

Name of Project town: - **SAGWARA**Venue: - **Nagerpalika, Sagwara**Date: - **19/11/20**Name of the Event/ Activity: - **Sagwara Lakes & playground Development at Sagwara**

Issues covered: -

1

2

3

4

S.No.	Name	Sex		Designation/Role	Contact No.	Signature
		Male	Female			
1	Mr. Narendra Khosla CHAIRMAN, Sagwara Nagerpalika	m		Chairman N.P., Sagwara	9414566658	
2						
3	Mr. Raju Saikh (Vice-chairman)	m		Vice-chairman N.P., Sagwara	9414566758	
4	महेश्वर शर्मा	m		महेश्वर	9929404250	
5	सुधीर मोहान	M		पट्टी	7232039474	
6	पिंशीर कुमार	m		महेश्वर	9414567449	
7	लाडु गजारे	M		पट्टी	6376212151	
8	हरि जोशी	m		महेश्वर	7568710893	
9	Vishal Jaiswal	m		महेश्वर	9328091960	
10	अरुण जोशी	m		पट्टी	7424818298	
11						
12						

Town level consultation and news coverings
News Paper cutting and attendance sheet for city level consultation at municipal office,
Sagwara on 13-08-2022



इंगरपुर भास्कर 14-08-2022

आरयूआईडीपी और एशियन डेवलपमेंट बैंक के अधिकारी शामिल

तालाबों के सौंदर्यीकरण और कॉलोनी खेल मैदान के विकास के लिए बैठक

भास्कर न्यूज़ | सागवाड़ा

शहर के पांच तालाबों के सौंदर्यीकरण और पुनर्वास कालोनी के खेल मैदान का कार्य जल्द ही शुरू होने वाला है। इसे लेकर शनिवार को नगरपालिका में आरयूआईडीपी और एशियन डेवलपमेंट बैंक के अधिकारियों ने बैठक ली। एडीबी के पर्यावरण सलाहकार गोविंद सिंह राठौर, विरासत संरक्षण विशेषज्ञ सलाहकार एडीबी गुरमीत राय, जैव विविधता विशेषज्ञ पीएमसीबीसी आरयूआईडीपी, जयपुर सुरेंद्र सिंह नागदाली और विरासत विशेषज्ञ पीएमसीबीसी आरयूआईडीपी जयपुर मानस शर्मा ने शहरवासियों और नगरपालिका अध्यक्ष नरेंद्र खोडनिया समेत जन प्रतिनिधियों से चर्चा कर शहर के पांचों तालाबों के



सागवाड़ा. बैठक में अधिकारियों को जानकारी देते पालिका अध्यक्ष।

बारे में जानकारी ली। फिलहाल शहर के पांच तालाब दुर्दशा के शिकार हैं। तालाबों में जलकुंभी और गंदगी भरी पड़ी है। लोहारिया, मसानिया, गमरेश्वर, हरियाला और बोलिया तालाब की ओर किसी ने ध्यान

नहीं दिया। पालिका अध्यक्ष नरेंद्र खोडनिया ने बताया कि तालाबों का सौंदर्यीकरण चुनाव का प्रमुख वादा था। इसलिए इस कार्य की मुख्यमंत्री से भेंट में घोषणा कराई गई है। मुख्यमंत्री बजट घोषणा के अनुरूप

सागवाड़ा शहर को आरयूआईडीपी के प्लान में शामिल किया गया था। दोनों कार्यों का सर्वे और डीपीआर का काम पूरा कर लिया गया है। नगरपालिका सागवाड़ा के जेईएन लोकेश पाटीदार ने बताया कि इन कार्यों के लिये सोशल सर्वे का काम और टेंडर भी हो गया है। शहर में पेयजल और सीवरेज के लिये 100 करोड़ का टेंडर पहले ही लग गया है। इधर, शहर के पांच तालाबों के सौंदर्यीकरण पर 20 करोड़ रुपये खर्च होंगे। वहीं कॉलोनी की डेढ़ किमी सड़क के लिए 5 करोड़ की भी घोषणा की गई है। इसके अलावा पुनर्वास कॉलोनी के खेल मैदान का पूरा स्वरूप ही बदल कर इसमें क्रिकेट, फुटबॉल, लांग टेनिस और वालीबॉल का मैदान तैयार किया जाएगा।

**विहिप व
बजरंग दल
की तिरंगा
यात्रा आज**

साबला। विश्व हिंदू परिषद एवं बजरंग दल साबला की बैठक शनिवार को हुई। विश्व हिंदू परिषद प्रखंड अध्यक्ष प्रकाश उपाध्याय ने बताया कि रविवार शाम 4.30 बजे गरवा चौक से अम्बेडकर चौक साबला तक

अखंड भारत तिरंगा यात्रा का आयोजन किया जा रहा है। इसमें साबला तहसील के लोग उपस्थित रहेंगे। हाथों में तिरंगा लेकर आजादी के अमृत महोत्सव की पूर्व संध्या पर कार्यक्रम हो रहा है। प्रखंड

अध्यक्ष प्रकाश उपाध्याय, उपाध्यक्ष सुभाष जोशी, बजरंग दल संयोजक जुगनू जानी, सह संयोजक सीरभ व्यास, जयेश शर्मा, कान्हिलाल शर्मा, रामेश्वर मौणा, मुकेश जोशी, भावेश मेहता आदि मौजूद रहे।

zee rajasthan ▶ Dungarpur

सागवाड़ा : जल्द शुरू होगा पांच तालाबों के सौंदर्यीकरण का काम, आरयूआईडीपी व एशियन डेवलपमेंट बैंक के अधिकारियों ने की बैठक

सागवाड़ा : डूंगरपुर जिले के सागवाड़ा कस्बे के पांच तालाबों के सौंदर्यीकरण का कार्य जल्द शुरू होने जा रहा है.

Written by [ज़ी राजस्थान वेब टीम](#)

Last Updated: October 29, 2022, 08:54 PM IST



trending photos



Clove Vastu Tips

लौंग से सिर्फ एक चीज जलाएं, हर परेशानी से मिलेगी निजात



सागवाड़ा : डूंगरपुर जिले के सागवाड़ा कस्बे के पांच तालाबों के सौंदर्यीकरण का कार्य जल्द शुरू होने जा रहा है. इसके साथ ही पुनर्वास कॉलोनी के खेल मैदान को भी विकसित किया जाएगा, इसके लिए आरयूआईडीपी व एशियन डेवलपमेंट बैंक के अधिकारी सागवाड़ा पहुंचकर नगर पालिका अध्यक्ष के साथ बैठक कर चुके हैं. आरयूआईडीपी व एशियन डेवलपमेंट बैंक के अधिकारी शनिवार को डूंगरपुर जिले के सागवाड़ा पहुंचे।



इस दौरान नगर पालिका सागवाड़ा में नगर पालिका अध्यक्ष नरेंद्र खोडानिया, उपाध्यक्ष राजू मामा शेख व अधिकारियों के साथ अधिकारियों ने बैठक की. बैठक में उपस्थित अवर अभियंता लोकेश पाटीदार ने टीम को सागवाड़ा के लिए प्रस्तावित जलापूर्ति सीवरेज प्लांट एवं तालाब के सौंदर्यीकरण की प्रस्तावित परियोजना से अवगत कराया. बैठक में सागवाड़ा नगर अध्यक्ष नरेंद्र खोडानिया ने बताया कि मुख्यमंत्री की बजट घोषणा के अनुसार सागवाड़ा शहर को आरयूआईडीपी के चौथे पन्ने में शामिल किया गया है.

दोनों कार्यों के लिए सर्वे और डीपीआर का काम पूरा हो चुका है। शहर में पेयजल व सीवरेज के लिए 100 करोड़ का टेंडर हो चुका है। शहर के पांच तालाबों के सौंदर्यीकरण पर 20 करोड़ रुपये खर्च किए जाएंगे। नगर अध्यक्ष नरेंद्र खोडानिया ने बताया कि तालाबों का सौंदर्यीकरण चुनाव का मुख्य वादा था. इसीलिए मुख्यमंत्री के साथ बैठक में इस काम की घोषणा की गई।

यह भी पढ़ें- चुनावी साल से पहले गहलोत सरकार का मास्टरस्ट्रोक, 1 लाख ग्रामीण परिवारों को मिलेगा 2000 करोड़ का कर्ज

इस कार्य को आरयूआईडीपी के चतुर्थ पृष्ठ में स्वीकृत किया गया है। तालाबों के किनारे वॉकिंग ट्रेक, गार्डन और फाउंटेन सिटी के इन पांच तालाबों के विकास की योजना तैयार है। सबसे पहले पानी की आवक से रुकावटों को दूर किया जाएगा और तालाबों को गहरा किया जाएगा। तालाब के पास वॉकिंग ट्रैक, बगीचा और फव्वारा लगाया जाएगा। लाइटिंग और पालों का सुदृढीकरण होगा।

Translation

Sagwara: The work of beautification of five ponds of Sagwara town of Dungarpur district is going to start soon. Along with this, the sports ground of the rehabilitation colony will also be developed, for this the officials of RUIDP and Asian Development Bank have reached Sagwara and held a meeting with the Municipal President. Officials of RUIDP and Asian Development Bank reached Sagwara in Dungarpur district on Saturday.

The meeting was attended by Municipal President Narendra Khodania, Vice President Raju Mama Sheikh, local public, and other officials of Sagwara municipality. The Junior Engineer Lokesh Patidar apprised the team about the proposed water supply sewerage plant for Sagwara and the proposed project of beautification of the ponds. In the meeting, Sagwara Municipal President Narendra Khodania told that as per the Chief Minister's budget announcement, Sagwara city was included in the fourth phase of RUIDP

The survey and DPR work for both the works have been completed. 100 crore tender has already been floated for drinking water and sewerage in the city. Rs 20 crore will be spent on the beautification of five ponds of the city. Municipal President Narendra Khodania told that the beautification of the ponds was the main promise of the election and was announced in a meeting with the Chief Minister.



इंगरपुर भास्कर 08-04-2022

आरयूआईडीपी में शहर में होने वाले कार्यों का सर्वे

भास्कर न्यूज़ | सागवाड़ा

नगरपालिका में 110 करोड़ के प्रोजेक्ट के कार्यों को मंजूरी मिलने के बाद इन कार्यों का सामाजिक सर्वेक्षण किया गया। इसे लेकर गुरुवार को जयपुर से आई आरयूआईडीपी की टीम ने योजना के तहत होने वाले कार्यों का मौका निरीक्षण किया। आरयूआईडीपी के राजीव शर्मा और डॉ. महावीर सैनी ने पालिका उपाध्यक्ष राजुमामा शेख, ईओ मुकेश कुमार मोहित और पार्षदों से शहर में होने वाले कार्यों के बारे में चर्चा की। पालिका के जेईएन लोकेश पाटीदार ने बताया कि आरयूआईडीपी के तहत शहर

में सड़क से लेकर सीवरेज का काम होना है। पिछले दिनों जयपुर में आरयूआईडीपी और एशियन डवलपमेंट बैंक के अधिकारियों के साथ पालिका के अधिकारियों की बैठक में एशियन डवलपमेंट बैंक से 110 करोड़ रुपये के कार्यों को मंजूरी मिली है। जिससे सीवरेज, वाटर सप्लाई, शहर के सभी तालाबों के सौंदर्यीकरण आदि के काम होने हैं। पालिका अध्यक्ष नरेंद्र खोडनिया ने बताया कि सागवाड़ा शहर सहित पुनर्वास कॉलोनी में भी वाटर सप्लाई, मैदान सुदृढ़ीकरण, सामुदायिक भवन के काम होने हैं। सर्वे का काम पूरा होने के बाद यह कार्य शुरू किये जा सकेंगे।

B. Stakeholders Consultations in CLC:

City level Stakeholder Committee (CLC) Meeting (dtd. 29.07.2021)- A town-level City Level Committee (CLC) has been formed in Sagwara 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 Sagwara on dtd. 29.07.2021 to discuss the matter of proposed Water Supply, waste water and gaps in other infrastructure in Sagwara under the chairmanship of District Collector, Dungarpur, in presence of Member of Legislative Assembly, DPR consultants, RUDSICO-EAP officials, PHED officials, Municipal Council officials, UIT officials, PWD and other invitee members. Proposed scope of works and technology was discussed in the meeting. The feedback and concerns of the stakeholders were taken into consideration for finalization of design and scope of works. The project was agreed by the committee for further course of action by RUDSICO-EAP. Minutes of CLC meeting, attendance sheet and photographs are given below-

Photographs of CLC Meeting



Minutes of CLC meeting with Outcomes

Government of Rajasthan

Office of the Executive Engineer, PIU,
Rajasthan Urban Sector Development Investment Program (RUSDIP), Udaipur

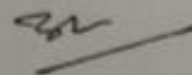
No./RUIDP/PIU/UDP/01/PH-IV/Dungarpur/2020-21/87-99 Date: 05/08/2021

A city level committee was held under the chairmanship of District Collector, Dungarpur at Panchayat Samiti Meeting Hall, Sagwara on 29.07.2021 to discuss the Waste water and Gaps in other infrastructure under RUIDP Phase IV for Sagwara town. List of members/officials attended the meeting is at annexure-A.

1. It was appraised that the DPR of Waste water and Gaps in other infrastructure is prepared by the Consultant Creative computers, Jaipur engaged by Municipal Board, Sagwara, which will be considered under RUIDP Phase IV. The suggestions from stake holders of city level committee will be considered in the project.
2. The basic scope of works & provision in DPRs were briefed to the committee by power point presentation. The estimated cost of DPR is about Rs. 101.62 Cr. (Capital Cost) for works proposed under Waste water and Gaps in other infrastructure and Rs. 8.11 Cr. For 10 years O&M. The capital cost for execution of works will be borne by the State Government financed by ADB under RUIDP Phase IV. The O&M cost for water supply works is to be borne by PHED and for sewerage works (STP, SPS & Sewer line) by Municipal Board. The O&M cost for payment will be performance based under the contract. After completion of project works the whole town will be benefitted with water supply and 1 out of 3 zone with sewerage facilities.
3. The brief scope of works are as follows:
 - **Water Supply Works:** - The main source of treated water is Beneshwer Anicut. The Existing source namely Lodeshwar dam shall continue to provide water to the town. All these sources are capable to meet out the ultimate demand of the Sagwara town. Under the project, 1 CWR (1400 KL), 2 no's new Overhead reservoir of capacity (1300 KL at New Pump house near Gas Godam and 200 KL at Punarwas Colony) will be constructed, all the old distribution pipe lines of AC & PVC pipes proposed to be replaced by DI K-7 pipe lines and also in the uncovered area within the municipal boundary limit of about 107.84 Kms. The entire area has been divided into 7 zones and 14 District Metering Area (DMA's) basis for non-revenue water (NRW) reduction. Provision of about 5811 Nos house service connections with domestic water meters for intermittent pressurized water supply is taken in the DPR. The entire system is proposed for automation on SCADA base for smooth O&M.



- **Sewerage Works:** - There is no existing sewerage system in the town. The scope under the project to provide sewer network of about 20 km length, one Sewage Treatment Plant (STP) of 3.0 MLD. STP 3.0 MLD is proposed to be constructed on identified land near Banswara Highway (Govt. Primary School No 10). It was informed that STP is proposed on latest Sequential Batch Reactor (SBR) technology to meet out the latest effluent parameters. To reduce inconvenience to public deeper depth (3.5 mtr above) & circles where traffic is more, 0.59 Km trenchless technology for laying of the sewer is proposed. Area of town which is on the outskirts and having less habitation and population density is low has been proposed with Faecal Sludge & Septage Management (FSSM).
 - **Beautification of Ponds:-** For beautification of ponds different components like Stone pitching around wall to fix the lake area and desilting of lake to remove impurities, Landscaping for culture activity, Ghat for religious activity, Aeration for water to keep odor free, Manage activity like cycling, walking, jogging, Amphitheater for cultural activity, Programmable fountain for entertainment And all related services like drinking water, lavatory block and lighting and drainage of Total cost about Rs. 18.92 Cr.
 - **Community Center:** - 2 Community centers (one at Govt. School No. 8 at Banswara Road and one at Galiyakot Road Senior Secondary School) will be constructed under this project. Both will cater 600 peoples gathering at indoor facility with allied facility of kitchen, wash area, rooms with washroom. The main hall is in waffle slab design to meet acoustic specification with stage and double height ample space for open air functional space and for parking of Total cost about Rs. 4.00 Cr.
 - **Solid waste Management:** - In present Municipal board has been allotted 25 bigha land for solid waste management by district collector. MRF and Pit composting is under construction at Waste management center. Road Work, ADM Building and Store, Compound Wall, Weigh Bridge, Bio Gas Plant, Sanitary Landfill, Remediation, Mechanical and Electrification Works taken in count of cost about Rs. 3.25 Cr.
4. District Collector Dungarpur directed that it is the important project for RUIDP and RUIDP should follow all norms for the work to be executed for Waste water and Gaps in other infrastructure project. It is also directed consultant to visit the site along with the local representatives of Nagar Palika and take provisions in the DPR for redressal of water supply related problems in their area so that inconvenience to public should be minimized.



5. STP, Udaipur gave feedback that construction should be done above HFL area, Inlet point should be Shown on the map so that no encroachment will be done on the inlet point of the pond.
6. It was also deliberated that for public complaint redressal provision to toll-free number along with provision for customer service centers will be taken under the contract. The O&M payment will be performance based under the contract.
7. The representative of the Municipal council suggested to take up the excavation of trenches for sewer work in such a way, that the trench excavated for laying sewer lines should not be laying longer without restoration.
8. It was assured that suggestions and directions of the city level committee will be incorporated in the proposed detailed project report.

After deliberation, the project was agreed by the committee for further course of action at RUIDP level. Meeting ended with vote of thanks to chair.


Executive Engineer
RUIDP (PIU) Banswara
(Member Secretary, CLC Sagwara)

No./RUIDP/PIU/UDP/01/PH-IV/ Sagwara /2020-21/ 07 - 99
Copy to the following for information and necessary action please.

Date: 05/08/2021

1. PA to Hon'ble MP, Sagwara
2. PA to Hon'ble MLA, Sagwara
3. PA to The Project Director, RUIDP, PMU, Jaipur
4. The District Collector, Dungarpur
5. The Chairman, Nagar Palika, Sagwara
6. The Executive Officer, Nagar Palika, Sagwara
7. The Superintending Engineer, PWD/PHED/AVVNL/WRD, Sagwara
8. The Superintending Engineer, RUIDP Phase IV/WW/WS, Jaipur
9. The Sr. Town Planner, Udaipur
10. Guard File

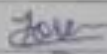
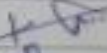
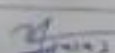

Executive Engineer
RUIDP (PIU) Banswara

Attendance Sheet of CLC Meeting

CLC Meeting on Dated 29.07.2021

Venue - Panchayat Samiti Sabhagar, Sagwara

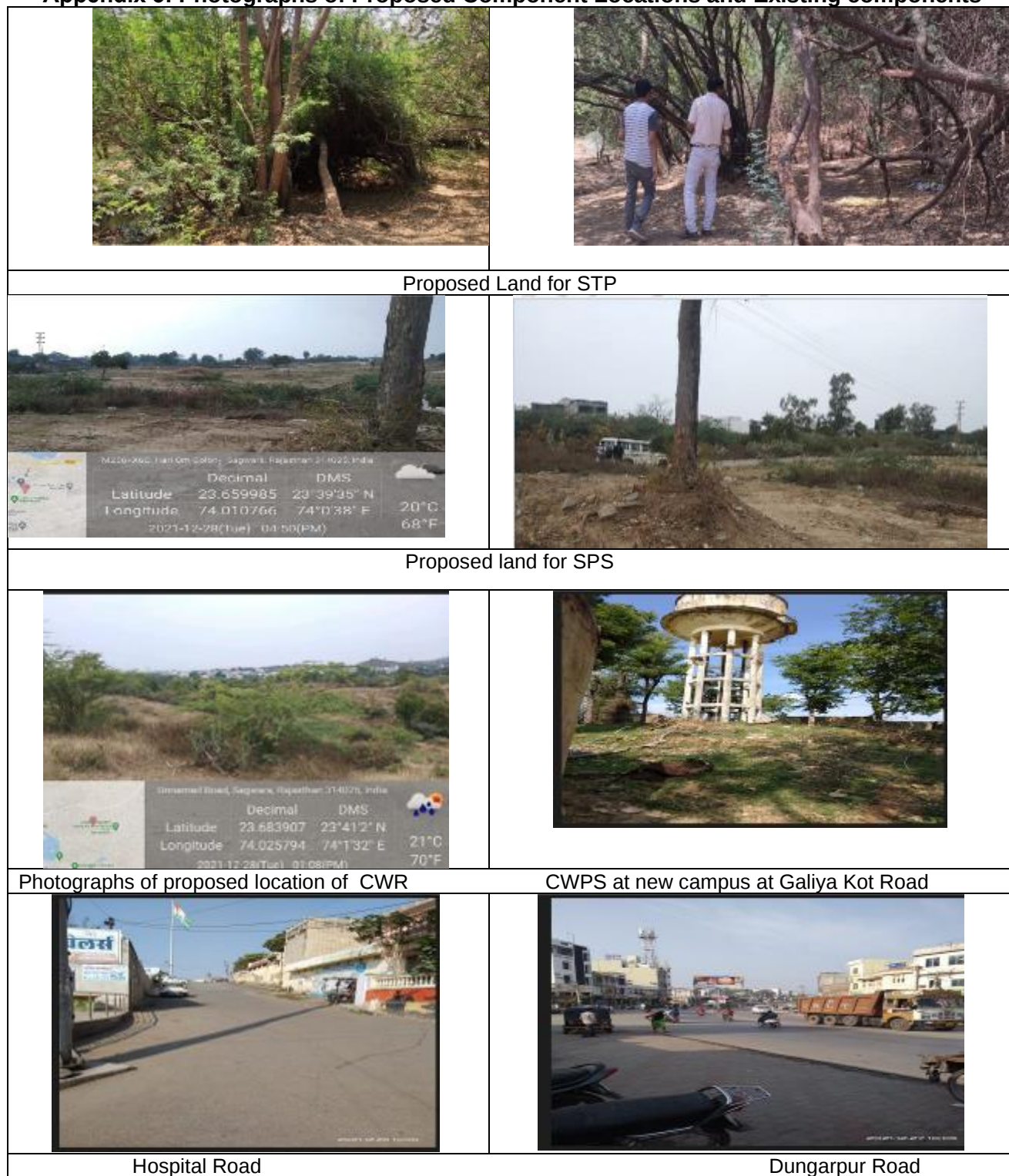
Attendance Sheet

Sr. No.	Name	Designation	Signature	Mobile No.
1	Suresh ota	collector		9634672052
2	HARENDER KHOSLA	chief mtn Nagar palika		9414544658
3	Mohamed Ismail	write chairman		9414586758
4	Rajeev Bhandari	SDO/DO Sagwara		9402304630
5	Manish Arora	SE, RUIDP		8003277650
6	Ashok Tongia	XEN RUIDP		9602135607
7	Vikas Lohi	Asn Durgapur		9782460637
8	Jayanti Lal	Asn PHEB Sagwara		9601085168
9	Shilpa patidar	Asn PWD Sagwara		9660016234
10	Lokesh patidar	JEN Nagar Palika		9461857373
11	Talbeer Datta	DPR consultant		9414042624
12	Dr. Raju Kumar	PMO Sag.		8696440044
13	Gurpreet Khatn	EEWRD Sagwara		9460274918
14	LOKESH BHATEVARA	Asn (Jen) AVVNL-Sag		9413291882
15	KEYUR SHAH	ARCHITECT		9727773771
16	Nagendra Sharma	TDA, Sagwara		9981001515
17	Vinay Purohit	Patwari sagwara		7745204413
18	Mamoo Nayase	Asn STP Nagar Palika		9414724638
19	AJ-Karnawat	STP, DDA/PL Zone		9929990030
20				

Photographs of CLC Meeting



Appendix 3: Photographs of Proposed Component Locations and Existing components





Galiyakot Road



Gamleshwar Talab Road



Gol Circle



Aspur Road



Private Bus stand Road



Nagar Palika Road

Contractor should organize Monsoon Health Camps and Monitor Workmen Habitat and Hygiene.

Appendix 4: NOCs
Water allocation letter from PHED for Dungarpur Water Supply Project

कार्यालय अधीक्षण अभियन्ता जन स्वा. अभि. विभाग, परियोजना वृत्त बोंसवाड़ा

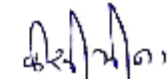
E-Mail :- seprobkn@gmail.com

क्रमांक :- अ.अ./परि-वृत्त/बोंस/स्था./2021-22/998-1002 दिनांक: 23/11/2021

अधिशायी अधिकारी
नगरपालिका सांगवाड़ा

विषय:- शहरी जल योजना सांगवाड़ा की जलापूर्ति हेतु आवश्यक जल मांग को आरयूआईडीपी के प्रस्तावित स्वच्छ जलाशय तक उपलब्ध कराने बाबत।
संदर्भ:- आपका पत्रांक 1870-74 दिनांक 15.11.2021।

उपरोक्त विषयान्तर्गत निवेदन है, कि इस वृत्त के संबंधित अधिशायी अभियन्ता से हुई वार्तानुसार डूंगरपुर जिले की पंचायत समिति सांगवाड़ा व साबला के 212 ग्राम एवं शहर सांगवाड़ा को सतही स्रोत बेगेश्वर एनिकट से शुद्ध पेयजल उपलब्ध कराने की पेयजल परियोजना की डी.पी.आर का कार्य प्रक्रियाधीन है, जिसके अन्तर्गत शहरी जल योजना सांगवाड़ा की जलापूर्ति हेतु शहर की प्रतिदिन जल मांग 10.14 एम.एल.डी. का प्रावधान सम्मिलित है, जिसे आरयूआईडीपी द्वारा प्रस्तावित स्वच्छ जल शय सांगवाड़ा नैस गोदाम तक उपलब्ध करा दिया जाएगा।

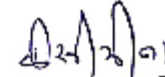


(के.सी.मीना) 23/11/2021

अधीक्षण अभियन्ता,
जन स्वास्थ्य अभियांत्रिकी
विभाग परियोजना वृत्त
बोंसवाड़ा

क्रमांक :- अ.अ./परि-वृ/बोंस/स्था./2021-22/998-1002 दिनांक: 23/11/2021
प्रतिलिपि निम्न को आवश्यक कार्यवाही एवं सूचनार्थ:-

1. अति. मुख्य अभि. जन स्वा. अभि. विभाग परि. क्षेत्र उदयपुर।
2. अधीक्षण अभियन्ता, जन स्वा. अभि. विभाग, वृत्त, डूंगरपुर।
3. अधिशायी अभियन्ता, जन स्वा. अभि. विभाग, परियोजना खण्ड-द्वितीय, उदयपुर।
4. अधिशायी अभियन्ता, आरयूआईडीपी, उदयपुर।



अधीक्षण अभियन्ता, 23/11/2021
जन स्वास्थ्य अभियांत्रिकी
विभाग परियोजना वृत्त बोंसवा
ड़ा

Transcript in English**Office of Superintending Engineer, PHED, Circle- Banswara****S.No.:- A.A/Project-Circle/Bans/PHED/2021-22/998-1002****Dated 23.11.2021****Executive Engineer,
Nagar Palika, Sagwara**

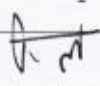
Subject:- To Provide necessary water demand to proposed Clear Water Reservoir of RUIDP for fulfilment of water requirement of Urban Water Project, Sagwara

Reference:- Your letter 1870-74 dated 15.11.2021.

With reference to aforesaid subject, it is requested that as per the communication held with Executive Engineer of this circle, DPR preparation of Water supply to provide clear drinking water from Surface water source Beneshwar anicut to Panchayat samite, Sagwara and 212 villages of Saable and Sagwara town is in process under which provision of 10.14 MLD water supply per day to fulfil the water requirement of Urban water project is included and it will be provided upto Proposed Clear Water Reservoir, Sagwara Gas Godam through RUIDP.

(K C Meena)
Superintending Engineer
PHED, Project Circle
Banswara

Approval of Associated Project from Govt. of Rajasthan for Dungapur Water Supply
Copy of MOM of State Level Scheme Sanctioning Committee (SLSSC) committee meeting dtd.
18.01.2022

	OFFICE OF THE CHIEF ENGINEER (JJM), PHED, RAJASTHAN JAL BHAWAN, 2 CIVIL LINES, JACOB ROAD, JAIPUR Phone: 0141-2222183, e-mail: rj-cejim@nic.in																				
No. F.2(11)PHED/CE(JJM)/SLSSC-31 st /2021-22/ <u>12930-12975</u> Date: <u>18.01.2022</u>																					
MINUTES OF 31st MEETING OF STATE LEVEL SCHEME SANCTIONING COMMITTEE (SLSSC) DATED 05.01.2022																					
The 31 st meeting of the State Level Scheme Sanctioning Committee (SLSSC) of PHED, Rajasthan (13 th meeting under Jal Jeevan Mission) was held on 05 th January, 2022 under the Chairmanship of Additional Chief Secretary, PHED through Video Conferencing. The List of Participants is enclosed.																					
At the outset of the meeting, Chief Engineer (JJM) briefed about sanctions so far (Up to 30 th SLSSC) under JJM as under:																					
	<table border="1"> <thead> <tr> <th></th> <th>No. of Schemes</th> <th>No. of Villages</th> <th>No. of FHTCs</th> <th>Estimated Cost (Rs. in Cr)</th> </tr> </thead> <tbody> <tr> <td>OTMP</td> <td align="center">8362</td> <td align="center">13,938</td> <td align="center">35,44,795</td> <td align="center">14,467</td> </tr> <tr> <td>MP</td> <td align="center">123</td> <td align="center">18,771</td> <td align="center">44,69,954</td> <td align="center">39,511</td> </tr> <tr> <td>Total</td> <td align="center">8485</td> <td align="center">32,709</td> <td align="center">80,14,749</td> <td align="center">53,978</td> </tr> </tbody> </table>		No. of Schemes	No. of Villages	No. of FHTCs	Estimated Cost (Rs. in Cr)	OTMP	8362	13,938	35,44,795	14,467	MP	123	18,771	44,69,954	39,511	Total	8485	32,709	80,14,749	53,978
	No. of Schemes	No. of Villages	No. of FHTCs	Estimated Cost (Rs. in Cr)																	
OTMP	8362	13,938	35,44,795	14,467																	
MP	123	18,771	44,69,954	39,511																	
Total	8485	32,709	80,14,749	53,978																	
It was also submitted that Under Secretary to Govt, NJJM, New Delhi vide letter no. W-11011/14/2021-JJM-I-DDWS Dated 04.01.22 (Copy enclosed as Annexure-A) conveyed observations on agendas of 31 st SLSSC meeting of Rajasthan. The replies of comments were presented during meeting as per Annexure-B. Most of comments are general comments as also received for agendas of 30 th SLSSC and were discussed at length during 30 th SLSSC meeting also.																					
Proposal for Sustainability of Ground Water Sources, Community Tankas in desert area and non feasible villages for providing FHTCs, Construction of Water Harvesting Structures etc submitted by State Water Resources Department, Panchayati Raj Department and PHED were considered and deferred in 30 th SLSSC. It was also decided that Director, NJJM will discuss this proposal in office of NJJM. It was informed by Director, NJJM that same were discussed and state will require to present the proposals in Ministry, when asked. Chairman, SLSSC & Additional Chief Secretary, PHED conveyed thanks to Director, NJJM for his sincere efforts.																					
The following agendas were considered:																					
<u>Agenda- 1 Confirmation of minutes of 29th SLSSC meeting held on 09.11.2021</u>																					
It was submitted that Part-I minutes of the meeting of 29 th SLSSC meeting held on 09.11.21 were issued vide no. 8535-65 Dated 07.12.2021. It was requested that same may be confirmed.																					
It was also submitted that Part-II minutes of 29 th SLSSC meeting held on 09.11.21 for proposals of 4 districts after end of model code of conduct due to Panchayati Raj Elections (Baran, Kota, Karauli & Ganganagar) were issued vide 9562-82 Dated 27.12.21. It was requested that same may be confirmed.																					
1 																					

4 (S.Madhopur)	3.0872	1.5497	0.0693	1.4682	0	0	0	0
1 (Dholpur)	1.2939	0.4733	0.5701	0.2505	0	0	0	62
6 (Udaipur)	3.3452	1.3388	1.4057	0.6007	0	0	0	0
29 (Total)	22.9091	9.2723	8.263	5.3738	0	0	0	27

Under Secretary to GoI , NJJM, New Delhi vide letter no. W-1106/14/2021-JJM-I-DDWS Dated 18.01.22 conveyed comments as under on draft minutes sent to them on 11.01.22:-

Comments	Reply
The O&M of the schemes is not to be met from Central fund of JJM.	In all proposals submitted to SLSSC, the cost of O&M part of schemes is being proposed in State share. O&M of the scheme is not met from central fund.

It was decided to accord revised approval (Revised A&F Sanction) of above 29 schemes having additional cost Rs. 22.9091Cr. (Annexure of Agenda-16).

[Action by CE (JJM) / ACE (All)]

Agenda- 17: Proposals Schemes for De- Sanction by SLSSC (Other Than Major Project) – SVS (including some regional schemes)

Following 1 scheme of Dist- Sawai-Madhopur as summarized below was proposed for De- Sanction by SLSSC:-

Nos. of Schemes	Estimated Cost (Rs. in Crore)				No. of Villages Planned			No. of FHTCs Planned
	Total	Central Share	State Share	Community Contribution	Total	PWS	Non PWS	
1 (22 nd SLSSC Dated 12.03.21)	7.40	3.70	3.70	0	2	2	0	1683

The schemes / proposals wise details are available in prescribed Table-10. Reasons for De-sanction submitted were that both villages (Bamanwas Patti Kalan & Bamanwas Patti Khurd) included in this regional scheme converted in single Nagar Palika vide GoR notification dated 25.06.21.

SLSSC was requested to De- sanction of above 1 scheme.

It was decided to De- Sanction of above 1 scheme having sanctioned cost Rs. 7.40 Cr. (Annexure of Agenda-17).

[Action by CE (JJM) / ACE (Bharatpur)]

Agenda- 18: Schemes for consideration and approval of SLSSC (Major Project) – MVS

Following 4 Projects as summarized below were proposed for consideration and approval of SLSSC:-

Name of Project	Estimated Cost (Rs. in Crore)				No. of Villages Planned			No. of FHTCs Planed	Average Per FHTC Cost (in Rupees)
	Total	Central Share	State share	Community Contribution	Total	PWS	Non PWS		
1. WSP of 233 Villages (Gangatalai-97 & Anandpuri 136) of Dist- Banswara from Jher Anicut near terminal point of Mahi & Anas River (Kadana Back Water).	710.42	306.43	388.18	15.81	233	8	225	66934	89452/-
2. WSP of 212 Villages (Sabla & Sagwara Block) of Dist- Dungarpur from Baneshwar Anicut	427.69	161.39	263.63	2.67	212	55	157	60351	66314/-
3. WSP of 353 Villages (Chikhli, Simalwara, Jhonthary & Galiyakot Block) of Dist- Dungarpur from Kadana Back Water (Mahi Dam)	885.56	397.57	474.04	13.95	353	54	299	95302	80854/-
4. WSP of 648 Villages (Block Begun-142, Bhainsorgarh-82, Gangrar-98, Chittorgarh-215 Bhadesar-45 & Nimbaheda-66) of Dist- Chittorgarh from Chambal River	2245.72	972.16	1232.27	41.29	648	96	552	85123	148785/-
Total (4 Projects)	4269.39	1837.55	2358.12	73.72	1446	213	1233	307710	

This is related to Sagwara

The scheme / proposal details are available in prescribed Table 10. It was submitted that in all above 4 Projects, source is surface source & water reservation is available. It was further submitted that the Scrutiny of the project has been made as per guidelines of JJM. The Projects' DPR has been scrutinized as per general Comments regarding design & estimates of Gol conveyed vide letter dated 12.03.2021. Though it has been tried to adhere to Gol guidelines, however any deviations are found, will be rectified at the time of Technical sanctions of the project. Certificate regarding non duplication of sanctions duly signed by regular and project wing have been taken.

SLSSC was requested to accord approval (A&F Sanction) of above 4 Projects total costing Rs. 4269.39 Cr.

It was deliberated in meeting that one project of Dist Chittorgarh based on Chambal River, infrastructure is included for some villages for which OTMP schemes were already sanctioned in earlier SLSSCs (Detailed in Table-10). It was decided that concerned CE / ACE should certify that no in-village infrastructure work has been included in these projects for the villages

 20

Approval letter from Finance Committee, Govt. of Rajasthan of Associated Project

Finance Committee Meeting :798/31.03.2022

** SUMMARY RECORD OF DECISIONS **

798th meeting of the Finance Committee of Rajasthan Water Supply & Sewerage Management Board, Jaipur was held on 31.03.2022, wherein following were present:-

1. Sh Sudhansh Pant	Addl. Chief Secretary, PHED, GoR, Jaipur	Chairman
2. Sh Prakash Rajpurohit	Mission Director, JJM, Rajasthan	Member
3. Sh Sandeep Sharma	Technical Member, RWSSMB, Jaipur	Member
4. Sh K C Kumawat	FA&CAO, RWSSMB and Representative of Finance Department	Member
5. Sh R K Meena	CE(Rural), PHED, Jaipur	Member
6. Sh D K Gaur	CE(SP), PHED, Jaipur	Member
7. Sh C M Chauhan	CE(U&NRW), PHED, Jaipur	Member
8. Sh K D Gupta	Secretary, RWSSMB	Secretary

Following were also present in the meeting:

1. Smt. Pushpa Satyani, (JS-I), PHED, Jaipur
2. Sh Dinesh Goel, CE(JJM), PHED, Jaipur

Following decisions were taken in the meeting:-

Agenda item no. 1: Confirmation of minutes of FC 797/23.03.2022
Summary record of decisions of the meeting of FC797 dated 23.03.2022 issued vide no. No.:F.3 () / FC 797/2021-22/ 7260-7312 dated 23.03.2022 and corrigendum issued vide no. No.:F.3 () / FC 797/2021-22/ 7325-7377 dated 28.03.2022 were confirmed.

Agenda item no. 2: Approval of price bid for the work of designing, providing, installing and commissioning of 300 nos. solar energy based bore well water pumping system, including comprehensive operation and maintenance for a period of seven years in various villages/ habitations of District Udaipur under PHED region Udaipur against NIT No. 01/2021-22 (EC Rs. 2000.00 lacs)

- 1) The agenda item was considered in light of the comments of TM and FA&CAO and presentation made by CE(Rural), PHED, Jaipur. During presentation, the following was informed:
 - (i) Instant proposal is for approval of price bid for the work of designing, providing, installing and commissioning of 300 nos. solar energy based bore well water pumping system, including comprehensive operation and maintenance for a period of seven years in various villages/ habitations of District Udaipur under PHED region Udaipur against NIT No. 01/2021-22.
 - (ii) 8 bids were received online for the work and 2 bidders were qualified for opening of price bid and price bid of the same were opened on 25.08.2021.
 - (iii) The lowest offer of M/s GA Infra Pvt. Ltd., Jaipur for Rs. 19,38,39,990.00 was 3.08% lower than the estimated

executed work remains idle for longer period and benefit of the work is available to the public in the shortest time. Interfacing of the various works /packages shall also be ensured

- (vi) The proposed works under the project shall be dovetailed with the ongoing/already sanctioned works on this scheme, if any, and also with the various components of the existing scheme including O&M of running/existing contracts.
- (vii) Required clearances from all the agencies shall be obtained well in time, so as to avoid any hindrance during execution of the work
- (viii) Repairing of road shall be carried out as per latest circular for repairing/ restoration of roads.
- (ix) Compliance of all general limitations/conditions and provisions of SOP issued by Finance Department vide dated 08.03.2017 shall be ensured.

4) Conclusion of decision: A&F sanction for 06 major projects total costing to Rs. 5089.17 Cr having total state share amounting to Rs. 2801.71 Cr accorded.

[Action by: CE(SP)]

Agenda item no. 18:
Revised A&F sanction
of 06 MP schemes
costing more than Rs.
5.00 Cr approved
(sanctioned) in 31st
meeting of SLSSC
held on 05.01.2022
under JJM
(Total revised EC Rs.
5504.67 Cr)

- 1) The agenda item was considered in light of comments of TM and FA&CAO and presentation made by CE(SP). During presentation, the following was informed:
 - (i) Instant proposal amounting to Rs. 5504.67 Cr is for revised A&F sanction for 06 MP schemes costing more than Rs.5.00 Cr which were revised & sanctioned in 31st meeting of SLSSC held on 05.01.2022.
 - (ii) Original approval of 2 projects was accorded in PPC204/18.05.2021 and 4 projects were approved in PPC206 dated 29.10.2021.
 - (iii) Original A&F sanction of these 06 MP schemes was accorded in various meeting of Finance Committee.
 - (iv) Cost of these projects has been revised due to revision in estimates as per PHED, BSR, 2021 and considering techno-economic aspects.
 - (v) 'On file' prior approval was accorded by Hon'ble Minister PHED and Chairman PPC vide MR-409/M/PHED/21 dated 14.02.2022 which was confirmed in PPC207 dated 22.02.2022 and financial concurrence from the Finance Department for State share matching has been received vide ID no. 102201476 dated 16.03.2022.
 - (vi) Cost break of these revised 06 major projects costing more than Rs. 5.00 Cr is as under:

No. of schemes	Estimated cost (Rs. in Cr)				No. of villages covered	No. of FHTCs
	Total	Central share	State share	Comm. Cont.		
06 (Original)	5550.63	1922.58	3628.05	0.00	1633	341994
06 (Revised)	5504.67	2401.86	3032.04	70.76	1475	348487

- 2) CE(SP) recommended to accord revised A&F sanction for 06 major projects total costing to Rs.5504.67 Cr sanctioned in 31st

Appendix 5: IBAT Assessment Checklist



Integrated Biodiversity Assessment Tool

PROXIMITY REPORT

SAGWARA_PROPOSED STP (3.6 MLD)

Country: India

Location: [23.7, 74]

Date of analysis: 27 April 2022 (GMT)

Buffers applied: 1 km | 10 km | 50 km

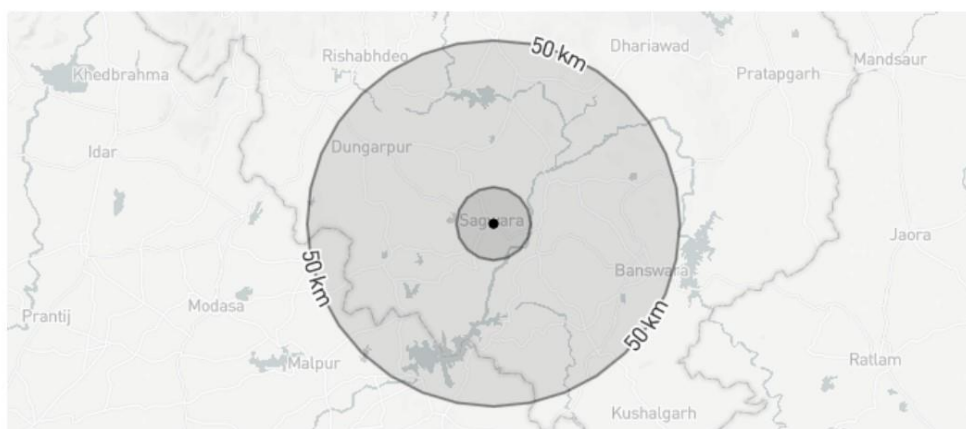
IUCN Red List Biomes: Freshwater, Terrestrial

Generated by: Noime Walican

Organisation: ADB

Overlaps with:

Protected Areas	0
Key Biodiversity Areas	0
IUCN Red List	35



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





About this report

This report presents the results of [6274-29965] 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 27 April 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 - April 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., Iribarrem, A., Beyer, H.L. et al. Global priority areas for ecosystem restoration. Nature 586, 724–729 (2020). <https://doi.org/10.1038/s41586-020-2784-9>





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.

No KBAs within buffer distance

IUCN Red List of Threatened Species

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

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

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Sypheotides indicus	Lesser Florican	AVES	CR	Decreasing	Terrestrial
Vanellus gregarius	Sociable Lapwing	AVES	CR	Decreasing	Terrestrial
Gyps bengalensis	White-rumped Vulture	AVES	CR	Decreasing	Terrestrial
Sarcogyps calvus	Red-headed Vulture	AVES	CR	Decreasing	Terrestrial
Gyps indicus	Indian Vulture	AVES	CR	Decreasing	Terrestrial
Nilssononia gangetica	Indian Softshell Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater





Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Rynchops albigollis	Indian Skimmer	AVES	EN	Decreasing	Terrestrial, Freshwater
Sterna acuticauda	Black-bellied Tern	AVES	EN	Decreasing	Terrestrial, Freshwater
Haliaeetus leucoryphus	Pallas's Fish-eagle	AVES	EN	Decreasing	Terrestrial, Freshwater
Neophron percnopterus	Egyptian Vulture	AVES	EN	Decreasing	Terrestrial, Freshwater
Falco cherrug	Saker Falcon	AVES	EN	Decreasing	Terrestrial, Marine, Freshwater
Leptoptilos dubius	Greater Adjutant	AVES	EN	Decreasing	Terrestrial, Freshwater
Tor putitora		ACTINOPTERYGII	EN	Decreasing	Freshwater
Manis crassicaudata	Indian Pangolin	MAMMALIA	EN	Decreasing	Terrestrial
Aquila nipalensis	Steppe Eagle	AVES	EN	Decreasing	Terrestrial
Crocodylus palustris	Mugger	REPTILIA	VU	Stable	Terrestrial, Freshwater
Lutrogale perspicillata	Smooth-coated Otter	MAMMALIA	VU	Decreasing	Terrestrial, Marine, Freshwater
Pangshura tecta	Indian Roofed Turtle	REPTILIA	VU	Decreasing	Terrestrial, Freshwater
Wallago attu		ACTINOPTERYGII	VU	Decreasing	Freshwater
Bagarius yarrelli		ACTINOPTERYGII	VU	Decreasing	Freshwater



KNOW YOUR
ENVIRONMENT



CONSERVATION
INTERNATIONAL



UN WCMC
World Conservation
Monitors



Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
<i>Aythya ferina</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>Lissemys punctata</i>	Indian Flapshell Turtle	REPTILIA	VU	Decreasing	Terrestrial, Freshwater
<i>Melursus ursinus</i>	Sloth Bear	MAMMALIA	VU	Decreasing	Terrestrial
<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>Amandava formosa</i>	Green Avadavat	AVES	VU	Decreasing	Terrestrial



Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Clanga hastata	Indian Spotted Eagle	AVES	VU	Decreasing	Terrestrial
Oryza malampuzhaensis		LILIOPSIDA	VU	Decreasing	Terrestrial



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Recommended citation

IBAT Proximity Report. Generated under licence 6274-29965 from the Integrated Biodiversity Assessment Tool on 27 April 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.



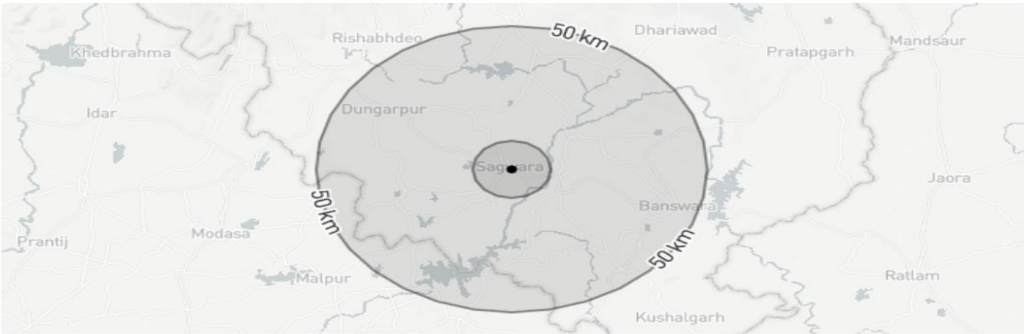


Integrated Biodiversity Assessment Tool
World Bank Group Biodiversity Risk Screen
SAGWARA_PROPOSED STP (3.6 MLD)

- **Country:** India
- **Location:** [23.7, 74]
- **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: 0	0
Alliance for Zero Extinction (AZE)	1 km: 0	10 km: 0	50 km: 0	0
IUCN Red List	15			
Critical Habitat	Unclassified			



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
Nilssoniana gangetica	Indian Softshell Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
Rynchops albicollis	Indian Skimmer	AVES	EN	Decreasing	Terrestrial, Freshwater
Sterna acuticauda	Black-bellied Tern	AVES	EN	Decreasing	Terrestrial, Freshwater
Haliaeetus leucoryphus	Pallas's Fish-eagle	AVES	EN	Decreasing	Terrestrial, Freshwater
Neophron percnopterus	Egyptian Vulture	AVES	EN	Decreasing	Terrestrial, Freshwater
Falco cherrug	Saker Falcon	AVES	EN	Decreasing	Terrestrial, Marine, Freshwater
Leptoptilos dubius	Greater Adjutant	AVES	EN	Decreasing	Terrestrial, Freshwater
Tor putitora		ACTINOPTERYGII	EN	Decreasing	Freshwater



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Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Sypheotides indicus	Lesser Florican	AVES	CR	Decreasing	Terrestrial
Vanellus gregarius	Sociable Lapwing	AVES	CR	Decreasing	Terrestrial
Gyps bengalensis	White-rumped Vulture	AVES	CR	Decreasing	Terrestrial
Sarcogyps calvus	Red-headed Vulture	AVES	CR	Decreasing	Terrestrial
Gyps indicus	Indian Vulture	AVES	CR	Decreasing	Terrestrial
Manis crassicaudata	Indian Pangolin	MAMMALIA	EN	Decreasing	Terrestrial
Aquila nipalensis	Steppe Eagle	AVES	EN	Decreasing	Terrestrial

Restricted Range Species

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Salvinia natans	Floating Fern	POLYPODIOPSIDA	LC OR LR/LC	Decreasing	Freshwater
Oreochthys cosuatis		ACTINOPTERYGII	LC OR LR/LC	Unknown	Freshwater
Oryzias latipes	Spotted Ricefish	ACTINOPTERYGII	LC OR LR/LC	Unknown	Marine, Freshwater
Macrobrachium rosenbergii	Giant River Prawn	MALACOSTRACA	LC OR 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

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

Species with potential to occur

Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
REPTILIA	55	5	0	1	4	4	45	1
AVES	324	20	5	7	8	15	289	0
ACTINOPTERYGII	44	3	0	1	2	2	37	2
MAMMALIA	64	6	0	1	5	3	55	0
AMPHIBIA	8	0	0	0	0	0	8	0
INSECTA	48	0	0	0	0	0	47	1
GASTROPODA	24	0	0	0	0	0	24	0
POLYPODIOPSIDA	3	0	0	0	0	0	3	0
MAGNOLIOPSIDA	39	0	0	0	0	0	38	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





Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
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 6: Source of Sustainability of Proposed Water Supply Work

Source Sustainability Report of Sagwara Water Supply Scheme

Selection of water source. An alternative source analysis has been conducted to select a feasible and sustainable source of water supply to meet the ultimate design demand of Sagwara town. Three alternatives: (i) Ground water; (ii) Lodeshwar Dam; (iii) Beneshwar Anicut were studied, and **Beneshwar Anicut** has been selected based on the techno-economic and environment considerations as elucidated below.

- Ground Water Source:** Presently Sagwara water supply is benefited from 6 nos. of tube wells at various locations in the city. These tube wells feed water directly into the water supply system. But, Presently Total water abstracted from Tube Wells is negligible, hence ground water sources are not sustainable for future water requirement.
- Lodeshwar Dam:** Lodeshwar Dam is 14.6 km. from the town and it meets to Moran River. Presently source of Water at Sagwara town is surface water from Lodeshwar dam with production of 4.46 MLD for urban town which is not enough for the project. So this dam is not taken as source for the proposed system.

	कार्यालय सहायक अभियन्ता जन स्वा अभि विभाग, उपखण्ड सागवाड़ा	
	क्रमांक:- १३७-१३८ श्रीमान अधिशाषी अधिकारी नगरपालिका सागवाड़ा।	दिनांक:- ०८/०३/२०२१
विषय :- शहरी जलयोजना सागवाड़ा के स्रोतों के संबंध में।		
उपरोक्त विषयान्तर्गत निवेदन है कि वर्तमान में शहरी जलयोजना सागवाड़ा के साथ १८ गांवों की जलापूर्ति हेतु लोडेश्वर डेम से की जाती है जिससे १०० एमसीएफटी जल आरक्षित है उससे २०५३ डिमाण्ड के अनुसार शहरी योजना सागवाड़ा एवं १८ गांवों के लिए जल आरक्षण पर्याप्त नहीं है। अतः हेतु शहरी जलयोजना सागवाड़ा वर्ष २०५३ की जल डिमाण्ड पूर्ण करने हेतु बेणेश्वर एनीकट से २१२ गांवों के साथ-साथ शहरी जलयोजना की पूर्ण डिमाण्ड सम्मिलित की गई है व लोडेश्वर डेम से १८ गांवों की जलयोजना जल जीवन मिशन के अन्तर्गत प्रस्तावित की गई है जिनके प्रस्ताव तकनीकी स्वीकृति विचारधिन है। अतः सागवाड़ा शहर की डिमाण्ड २१२ गांवों की परियोजना में सम्मिलित किया गया है।		
क्रमांक:- १३८ प्रतिलिपि:- १. श्रीमान अधिशाषी अभियन्ता जन स्वा अभि विभाग खण्ड-डूंगरपुर।	 सहायक अभियन्ता जन स्वा अभि विभाग उपखण्ड सागवाड़ा दिनांक:- ०८/०३/२०२१  सहायक अभियन्ता जन स्वा अभि विभाग उपखण्ड सागवाड़ा	

lii) Beneshwar Anicut: Beneshwar Anicut which is about 29 Km from Sagwara town. The Anicut situated about 3 Km from tehsil head quarter Sabla. Salient features of the Dam are as follow: -

a. Location

The Anicut situated about 3 Km from tehsil head quarter Sabla. The latitude and longitude are 23°58'00" and 74°02'00" respectively. The site is approachable by a tar road from Aspur-Banswara road from Sabla and about 60 km from district head quarter Dungarpur.

b. Catchment Area

As per available records with WRD gross catchment area is about 15988 sq km and general bed slope is 1:720. The peak flood discharge worked out to 13,93,311.85 cusecs. Combined discharge of Mahi, Som and Jakham passes through this Anicut. Major dams i.e. Mahi Bajaj Sagar Dam, Som Kamla Amba Dam and Jakham Dam are in upstream of Anicut.

c. Selection of Site

The site was selected looking at holy place Beneshwar Dham. It was constructed to facilitate pilgrims who came here for their rituals. Anicut storage water also provide irrigation facilitate of both banks of the river. Submergence area is within limits of the river banks.

d. Climate

The site is situated in sub-tropical, sub humid to humid climate conditions characterized by mild winter and moderate summers with high relative humidity during the month of July to September. The area experience mean monthly minimum temperature ranging from 11°C (January) to 26°C (June) and mean monthly maximum temperature ranges from 21.8°C (January) to 43.8°C (May) with some times goes up to 46°C.

e. Rainfall

The catchment area is too big i.e. 15,988 sq.km. spreading across Rajasthan and Madhya Pradesh and there are number of rain gauge stations in the catchment area. The nearest rain gauge station is at Sabla and annual rainfall is 750 mm.

A summary of mean monthly, seasonal and annual rainfall is given in table below. Average means annual rainfall for Sagwara town for last 50 years amount to 745.65 mm/yr.

On an average monsoon rainfall (months June to September) amounts to 95% of total annual rainfall for the same period. The same is shown in table 1.

Table 1: Monthly Rainfall Data of Sagwara for last 50 years

Year	Total Rainfall (mm)	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1971	304.90	0.00	0.00	0.00	0.00	0.00	139.80	91.50	73.60	0.00	0.00	0.00	0.00
1972	421.20	0.00	0.00	0.00	0.00	0.00	67.30	68.50	285.40	0.00	0.00	0.00	0.00
1973	1018.00	0.00	0.00	0.00	0.00	0.00	137.00	145.00	273.00	463.00	0.00	0.00	0.00
1974	407.20	0.00	0.00	0.00	0.00	22.00	30.00	125.00	126.00	1.00	103.00	0.00	0.00
1975	944.00	0.00	0.00	0.00	0.00	0.00	130.00	204.60	352.40	236.00	21.00	0.00	0.00
1976	1008.00	0.00	0.00	0.00	0.00	0.00	16.00	224.00	344.00	171.00	0.00	253.00	0.00
1977	953.00	0.00	0.00	0.00	0.00	32.00	203.00	249.00	285.00	184.00	0.00	0.00	0.00
1978	847.00	0.00	6.00	0.00	0.00	0.00	88.00	327.00	363.00	48.00	0.00	15.00	0.00

Year	Total Rainfall (mm)	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1979	591.00	0.00	0.00	0.00	0.00	0.00	19.00	113.00	285.00	0.00	8.00	166.00	0.00
1980	511.00	0.00	0.00	0.00	0.00	0.00	129.00	107.00	185.00	62.00	0.00	0.00	28.00
1981	708.00	7.00	0.00	0.00	0.00	0.00	81.00	128.00	300.00	143.00	0.00	49.00	0.00
1982	527.00	14.00	0.00	0.00	27.00	9.00	67.00	123.00	162.00	11.00	0.00	115.00	0.00
1983	739.00	0.00	0.00	0.00	12.00	0.00	112.00	310.00	137.00	109.00	59.00	0.00	0.00
1984	877.00	0.00	0.00	0.00	0.00	0.00	0.00	252.00	585.00	40.00	0.00	0.00	0.00
1985	340.00	0.00	0.00	0.00	0.00	0.00	0.00	99.00	124.00	3.00	114.00	0.00	0.00
1986	579.00	0.00	0.00	0.00	0.00	0.00	22.00	368.00	189.00	0.00	0.00	0.00	0.00
1987	754.00	0.00	0.00	0.00	0.00	0.00	158.00	46.00	547.00	3.00	0.00	0.00	0.00
1988	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1989	684.00	0.00	0.00	0.00	0.00	0.00	76.00	143.00	398.00	67.00	0.00	0.00	0.00
1990	903.00	0.00	0.00	0.00	0.00	0.00	144.00	311.00	259.00	189.00	0.00	0.00	0.00
1991	663.00	0.00	0.00	0.00	0.00	0.00	33.00	468.00	151.00	11.00	0.00	0.00	0.00
1992	609.00	0.00	0.00	0.00	0.00	0.00	21.80	215.20	214.00	78.00	74.00	6.00	0.00
1993	891.00	0.00	0.00	0.00	0.00	0.00	137.00	630.00	40.00	67.00	12.00	5.00	0.00
1994	1156.00	10.00	0.00	0.00	0.00	0.00	178.00	314.00	462.00	192.00	0.00	0.00	0.00
1995	440.00	0.00	0.00	0.00	0.00	0.00	68.00	153.00	123.00	66.00	30.00	0.00	0.00
1996	987.00	0.00	0.00	0.00	0.00	0.00	52.00	239.00	337.00	269.00	90.00	0.00	0.00
1997	739.00	0.00	0.00	0.00	12.00	18.00	67.00	261.00	205.00	156.00	10.00	3.00	7.00
1998	605.00	0.00	0.00	0.00	0.00	0.00	42.00	168.00	101.00	222.00	72.00	0.00	0.00
1999	628.00	0.00	0.00	0.00	0.00	14.00	155.00	270.00	68.00	80.00	41.00	0.00	0.00
2000	349.00	0.00	0.00	0.00	0.00	17.00	31.00	217.00	61.00	23.00	0.00	0.00	0.00
2001	523.00	0.00	0.00	0.00	0.00	0.00	97.00	264.00	134.00	0.00	28.00	0.00	0.00
2002	449.00	0.00	0.00	0.00	0.00	0.00	179.00	2.00	158.00	110.00	0.00	0.00	0.00
2003	721.00	0.00	26.00	0.00	0.00	0.00	164.00	284.00	113.00	134.00	0.00	0.00	0.00
2004	841.00	0.00	0.00	0.00	0.00	0.00	120.00	134.00	554.00	24.00	9.00	0.00	0.00
2005	621.00	0.00	0.00	0.00	22.00	4.00	22.00	304.00	141.00	128.00	0.00	0.00	0.00
2006	1434.00	0.00	0.00	0.00	0.00	0.00	132.00	306.00	740.00	256.00	0.00	0.00	0.00
2007	913.00	0.00	0.00	0.00	0.00	24.00	120.00	393.00	288.00	88.00	0.00	0.00	0.00
2008	561.00	0.00	0.00	0.00	0.00	0.00	88.00	162.00	184.00	127.00	0.00	0.00	0.00
2009	868.00	0.00	0.00	1.00	0.00	0.00	44.00	411.00	248.00	142.00	17.00	5.00	0.00
2010	623.00	0.00	0.00	0.00	0.00	0.00	33.00	151.00	242.00	157.00	0.00	40.00	0.00
2011	1078.00	0.00	0.00	0.00	0.00	0.00	30.00	343.00	511.00	194.00	0.00	0.00	0.00
2012	895.00	0.00	0.00	0.00	3.00	0.00	0.00	307.00	350.00	235.00	0.00	0.00	0.00
2013	1052.00	0.00	18.00	0.00	36.00	0.00	96.00	508.00	215.00	143.00	36.00	0.00	0.00
2014	633.00	54.00	6.00	0.00	7.00	19.00	0.00	205.00	112.00	230.00	0.00	0.00	0.00
2015	555.00	4.00	0.00	35.00	4.00	0.00	94.00	341.00	53.00	24.00	0.00	0.00	0.00
2016	917.00	0.00	0.00	0.00	0.00	0.00	73.00	403.00	386.00	32.00	23.00	0.00	0.00
2017	952.00	0.00	0.00	0.00	0.00	0.00	108.00	460.00	275.00	104.00	0.00	0.00	5.00
2018	910.00	0.00	0.00	0.00	0.00	0.00	192.00	252.00	361.00	105.00	0.00	0.00	0.00
2019	1216.00	0.00	0.00	0.00	0.00	1.00	191.00	195.00	374.00	348.00	107.00	0.00	0.00
2020	1337.00	0.00	0.00	5.00	0.00	0.00	81.00	200.00	943.00	106.00	0.00	0.00	2.00

f) Runoff

Peak flood discharge considered by a N.G.O. is 13,93,311.85 Cusecs (worked out from Dicken's Formula). A river gauging site (G&D site) of C.W.C. located at about 15 km in downstream at Padardi-Badi location. Gauge discharge data for more than 30 years are available for Mahi.

g) Submergence

The storage capacity of Anicut is 310 Mcft and submergence is within the limit of the river boundaries.

h) Storage Capacity

The storage capacity of Anicut is 310 Mcft.

As there is no other reliable source in the vicinity of town. Given the dependability, sustainability and government permissions, the Beneshwar Anicut is selected as water source for Sagwara town water supply scheme. It has sufficient amount of storage capacity of water to serve the people of Sagwara Nagar Palika up to ultimate year 2055.

Fig 2. Information on Baneshwar Anicut

Name of work:- Construction of wing walls of Baneshwar anicut near Village Nava-Tapra, Tehsil Sabla, District Dungarpur under T.A.D.

TECHNICAL - REPORT

An estimate amounting to Rs. ~~362.53~~ ^{362.53} lacs has been framed to cover probable cost of construction of wing walls for protection of bank erosion of Baneshwar Anicut across river Mahi near village Nava-Tapra of tehsil Aspur in district Dungarpur.

1- INTRODUCTION AND HISTORY:

Baneshwar anicut was constructed across river Mahi in downstream of Baneshwar Dham by M/s N.M. Sadguru Foundation, Dahod (N.G.O.) under T.A.D. sanctions. An agreement was signed dated 7.3.2005 between Commissioner, T.A.D. and Director, N.M.Sadguru Water and Development Foundation, Dahod, Gujrat for construction of this anicut. As per condition no. 12 of agreement maintenance work is being carried out under guidance of N.G.O. The condition no. 12 state "on completion of the project, the second party will ensure the operation and management of the project by forming an organization of beneficiaries and /or other local institutions for monitoring and managing the project after construction. The second party will provide constant guidance and training to the beneficiaries and such institution for the smooth post construction management of the project."

The work was completed in the year 2007. Presently on both banks in downstream, protection works are damaged and to be addressed urgently. Commissioner, T.A.D. vide his letter no. 1642 dated 25.2.2015 instructed to prepare estimate for protection work and in compliance this estimate has been prepared. At the time of construction downstream protection works were done by laying concrete and masonry work along earth cutting slopes. Due to passes of time this work is damaged, specially left flank work severely. Now it is proposed to construct self supporting retaining wall for protection of side slopes and accordingly estimate has been prepared.

2- LOCATION:

Anicut situated about 3 Km. from tehsil head quarter Sabla. The latitude and longitude are 23°58'00" & 74°02'00" respectively. The site is approachable by a tar road from Aspur-Banswara road from Sabla and about 60 km from district head quarter Dungarpur.

3- CATCHMENT AREA:

As per N.G.O. report gross catchment area is about 15,988 Sq.Km and general bed slope is 1:720. The peak flood discharge worked out to 13,93,311.85 cusecs.

Combined discharge of Mahi, Som and Jakham passes through this anicut. Major dams i.e. Mahi Bajaj Sagar Dam, Som Kamla Amba Dam and Jakham Dam are in upstream of anicut. Catchment area mostly hilly and fan shaped can be classified as "good" according to Strange's table.

4- SELECTION OF SITE:

The site was selected looking to pilgrim place Beneshwar Dham. It was constructed to facilitate pilgrim who came here for their rituals. Anicut storage water also provide irrigation facilitate of both banks of the river. Submergence area is within limits of the river banks.

5- CLIMATE:

The site is situated in Sub tropical, sub humid to humid climate conditions characterized by mild winter and moderate summers with high relative humidity during the month of July to September. The area experience mean monthly minimum temperature ranging from 11°C (January) to 26°C (June) and mean monthly maximum temperature ranges from 21.8°C (January) to 43.8°C (May) with some times goes up to 46°C

6- RAINFALL:

The catchment area is too big i.e. 15,988 sq.km. spreading across Rajasthan and Madhya Pradesh and there are nos of rain gauge stations in the catchment area. The nearest rain gauge station is at Sabla and annual rainfall is 750mm.

7- RUN OFF:

Peak flood discharge considered by N.G.O. as 13,93,311.85 Cusecs (worked out from Dicken's formula). A river gauging site (G&D site) of C.W.C. located at about 15 km in downstream at Padardi-Badi location. Gauge discharge data for more than 30 years are available for Mahi.

8- SUBMERGENCE:

The storage capacity of anicut is 310 Mcft and submergence is within limits of the river boundaries.

9- STORAGE CAPACITY:

The storage capacity of anicut is 310 Mcft.

10- SURPLUSING ARRANGEMENT:-

The length of anicut is 387 m and height 7.25m and its construction has been done as check-dam with broad crested weir. There are 79 nos. of openings at different elevation to regulate discharge of Mahi. 46 nos opening (44 of size 1.5x1.5m and 2 nos of size 1.5x0.45m) are at top level, 30 nos of opening (size 1.5x1.5m) at middle level. Gates are lowered and raised manually for regulation of river discharge. At bottom most level there are 3 nos of opening operated by valves. A rail line is laid (which can be opened during flood) on top of crest for transportation of gates

(manually) to position. The gates are fixed and remove manually after monsoon and before monsoon respectively to maintain required water level in the anicut. Looking to size of gate and discharge of Mahi, manual operation of gates is labour oriented work. The following are the parameters (as per N.G.O. estimate)

1.	F.T.L.	=	104.0m
2.	H.F.L.	=	113.90m
3.	Sill R.L.	=	102.50m
4.	Foundation R.L.	=	94.60m
5.	Bed of river	=	96.75m
6.	No. of openings	=	79
7.	Size of opening	=	1.5*1.5m, 500 mm dia C.I. pipes
8.	Size of piers	=	1.5*1.5m
9.	Size of M.S. gates	=	1.8*1.7m
10.	Length of Check Dam	=	387m
11.	Length of crest	=	328.5m
12.	Top width of anicut	=	1.50m
13.	Height of Check Dam	=	7.50m

11- TYPE OF WORK:

Construction has been done as a check-dam. In downstream steps constructed has been done in place of nappy. Other details are as following:

(i) Overflow (Broad crested weir) portion:-

Following are main parameters: overflow length 328.5m, peak flood discharge 3,14,242 cumecs.

(ii) Non-overflow:-

On both side masonry work has been done for protection work. In downstream, slope protection work is done by doing masonry work along slope. Its construction is not done as self retaining wall. Presently slope protection work is damaged and to be addressed earliest to stop further erosion of downstream and upstream at both flanks.

(iii) Stilling basin

Stilling basin provided in total width of 9 m which is presently in damaged condition.

12- WORK PROPOSED.

Downstream slope protection work has been done by laying concrete and masonry along the slope of bank. With passage of time it has been damaged. Left side downstream protection works are damaged severely and urgent protection works to be carried out to prevent further erosion. Also no protection wall was constructed in upstream of left side. At this place considerable erosion took place. This is also to be protected by construction of self supporting wing wall in upstream side. For slope protection in upstream and downstream it is proposed to construct self supported

retaining wall on both flanks. Length of wing walls taken as per existing construction along with flaring deep into side slopes to prevent any possibility of further erosion. Since upstream slope are also deteriorated so construction of wing walls on both flanks of upstream has also been proposed in this estimate.

13- RATES:-The rates in estimate are taken as per Water Resources Department, District Dungarpur B.S.R. 2014.

14- CONSTRUCTION MATERIAL REQUIRED FOR THE WORKS:-

Details of sources of construction material are as following:-

- (1) Stone and Aggregate:- Good Quality of stone and natural aggregate is available near village Vasunder.
- (2) Crusher broken aggregate:- From Crusher located near village Pindawal.
- (3) Sand:- Good quality of sand available at Som near Aspur.
- (4) Cement and Steel:- Cement and steel is available at Tehsil Sabla head quarter.

15- CHARGEABLE HEAD:-

The work is chargeable to head T.A.D. and administrative sanction to work is requested from Commissioner, T.A.D., Udaipur.


Executive Engineer,
Som Kamla Amba Canal Dn.
Aspur

iv) **Beneshwar Anicut water sustainability and environmental considerations.** The storage capacity of Beneshwar Anicut is 310 Mcft, while the water requirement of ultimate year (2055) for the project is 7.96 MLD or 2.91 MCM or 102.6 Mcft per year, which is about 33% of storage capacity of Beneshwar Anicut, which is adequate to meet the project yearly demand of the design year. Storage capacity is 3 times more than the annual water demand of Sagwara town. Also, during the dry summer months, the amount of water drawn would be miniscule compared to the water storage available. It is evident that the Anicut is full to its crest level at the end of monsoon season (September), which gradually reduced to its minimum in summer and up to the arrival of monsoon flows in June-July.

v) **Beneshwar Anicut Water quality.** Catchment area of the dam is spread over 15988 sq. km. The catchment area is mostly characterized by agricultural and barren lands, and forest areas. There is no polluting source like industry or mining in the catchment areas or town situated in this patch of river, only agriculture fields are found. Habitations are limited to small villages. Therefore, no significant impacts on surface water quality envisaged. Water quality sampling not done by DPR Consultant and water quality data of Water quality sampling done by DPR Consultant and water quality data of Beneshwar Anicut constructed Mahi River. It will be done during detailed design by DBO Contractor; and surface water quality monitoring has been including in monitoring plan.. A regular water quality regime needs to be established for checking the raw water quality. The water supplied to the consumers at all-time must meet the drinking water standards .

vi) **Wildlife & Protected area.** The nearest wildlife sanctuary is Sita Mata Sanctuary located 65 km from project town. In the forest blocks of Ghatol and Pipalkhut, some wild animals like blue bull, sambar, Jackal, jungle cat, deer, wild boar, monkey, wild dogs etc. have been observed. But there is no notified breeding or nesting bird site/ecological sensitive area/Ramsar convention site/Area notified under Wild Protection Act-1972 in these forest blocks as well as in town. In the forest blocks especially in Ghatol and Pipalkhut forest block, some wild animals are observed which are blue bull, sambar, Jackal, jungle cat, deer, wild boar, monkey, wild dogs etc. Our experts were told by locals that reptiles like common garden lizard (Chameleon zeylanicaul), common Indian monitor (Varanus beagalansis), Indian Cobra (Naja naja), and Krait (Bungarus coerulens) are rarely found in agriculture fields during rainy season. Common birds found in the region are Little egret (Egretta garzetta), Common Green Pigeon (Treron phoenicoptera), Blue Rock Pigeon(Columba livia), House swift(Apus affinis), Pheasant tailed Jacana(Hydrophasianus chirurgus) etc.No rare or migratory birds are reported in the project areas.

Appendix 7: Water Quality Report of Source

OFFICE OF THE JUNIOR CHEMIST
PUBLIC HEALTH ENGINEERING DEPARTMENT, Lab. Dungarpur (Raj.)
REPORT OF THE CHEMICAL EXAMINATION OF WATER

No. Lab Tech (Chem) 2021-2022/ 1826-1829

To, Assistant Engineer
 PHED Sub.Dn. Sagwara

Dated: 29 /03/2022
 District: Dungarpur
 Tehsil: Sagwara

Lab. Sample No.	Block / City	Gram Panchayat	Village	Habitation	Source	Source & Location	Date of Collection/Received	Date of Examination	Name of Sample Taker: Lab. Staff Chemical Test Reporting in PPM							
									pH	Turbidity	Chloride	Sulphate	Nitrate	Total Alkalinity	Total Hardness	Iron
814	Sagwara	UWSS Sagwara	UWSS Sagwara	UWSS Sagwara	Anicut	Beneshwar Dham Anicut	28.03.2022	29.03.2022	7.20	-	140	0.4	10	110	130	310

Junior Chemist
 PHED Lab. Dungarpur
 Dated: 03/03/2022

No. Lab Tech (Chem) 2021-2022/
 Copy to:

- 1 The Suptd. Engineer, P.H.E.D. Circle Dungarpur.
- 2 The Suptd. Chemist, P.H.E.D. Laboratory, Udaipur.
- 3 The Executive Engineer, P.H.E.D. Div. Dungarpur

Junior Chemist
 PHED Lab. Dungarpur

OFFICE OF THE JUNIOR CHEMIST
PUBLIC HEALTH ENGINEERING DEPARTMENT, Lab.Dungarpur(Raj.)
REPORT OF THE CHEMICAL EXAMINATION OF WATER

No. Lab/Tech(Chem)/2022-2023/
 To ,

196-188

Dated : 04 /05/2022

District: Dungarpur

Tehsil: Sagwara

Assistant Engineer

PHED Sub.Dn. Sagwara

Reff.No./Dt. 142 / 02.05.2022

Name of Sample Taker: Aen Staff

Lab. Sample No.	Block	Gram Panchayat	Village	Habitation	Source	Source & Location	Date Of Collection/ Received	Date Of Examination	Chemical Test Report mg/l in PPM							
									PH	Turbidity	Chloride	Fluoride	Nitrate	Total Alkalinity	Total Hardness	TDS
71	Sagwara	UWSS Sagwara	UWSS Sagwara	UWSS Sagwara	T.W.	Tube Well No.4 Gamathwara Colony Sagwara	02.05.2022	04.05.2022	7.40	0.20	140	0.53	39	270	320	720
72	Sagwara	UWSS Sagwara	UWSS Sagwara	UWSS Sagwara	T.W.	Tube Well No.2 Gamathwara Colony Sagwara	02.05.2022	04.05.2022	7.40	0.20	150	0.54	42	290	340	740
73	Sagwara	UWSS Sagwara	UWSS Sagwara	UWSS Sagwara	T.W.	Tube Well , C-Block Sagwara	02.05.2022	04.05.2022	7.60	0.10	120	0.52	24	240	280	610
74	Sagwara	UWSS Sagwara	UWSS Sagwara	UWSS Sagwara	T.W.	Tube Well , Near Doordarshan Kendra Sagwara	02.05.2022	04.05.2022	7.70	0.20	140	0.52	25	280	300	660
75	Sagwara	UWSS Sagwara	UWSS Sagwara	UWSS Sagwara	O.W.	Mahajan Well	02.05.2022	04.05.2022	7.80	0.30	100	0.48	12	240	250	550
76	Sagwara	UWSS Sagwara	UWSS Sagwara	UWSS Sagwara	O.W.	Khatik Well	02.05.2022	04.05.2022	7.90	0.30	100	0.54	18	230	250	530

Junior Chemist
 PHED Lab.Dungarpur

Dated : /05/2022

No. Lab/Tech(Chem)/2022-2023/
 Copy to:

- 1 The Suptd. Engineer, P.H.E.D. Circle Dungarpur.
- 2 The Suptd. Chemist, P.H.E.D. Laboratory, Udaipur.
- 3 The Executive Engineer, P.H.E.D. Div. Dungarpur

Junior Chemist
 PHED Lab.Dungarpur

Appendix 8: Copy of Approved Cost abstraction for Water supply project under Jal Jival Mission

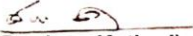
Drinking Water Supply Project for 212 villages (77 villages of Sabla Block and 135 villages of Sagwara Block) including their 255 Other Habitations & 1 Town of Sagwara Block of District Dungarpur- DPR for A&F

General Abstract of Cost

S.No.	PARTICULARS	AMOUNT (Rs. In Lakhs)
	PART -A : INTAKE STRUCTURE & WTP MAIN HEADWORKS	
	INTAKE STRUCTURE:	
1	Construction of Intake structure at Mahi River at Baneshwar Anicut complete including required Electrical, Mechanical, Instrumentation works and Panel room etc. in all respect as per drawing.	638.09
	WATER TREATMENT PLANT	
2	Construction of Water Treatment Plant of 34.70 MLD (1577.27 cum/hr) capacity including all relevant civil, mechanical, electrical, instrumentation, automization etc complete in all respect	1388.00
	SubTotal (Part -A)	2,026.09
	PART -B: PIPE LINE WORKS	
	RAW WATER PUMPING MAIN :	
3	P.L & Jointing of Raw water Pumping main of 700 DI K-7 pipes from Intake to WTP including required specials & appurtenances etc complete.	403.15
	TRANSFER PUMPING MAINS:	
4	P, L & Jointing of Transfer Pumping Mains of MS pipes from TPS-1, TPS-2 and TPS-3 including required specials & appurtenances etc complete	5,775.83
	CLUSTER PUMPING MAINS :	
5	Providing, Laying & Jointing of Cluster Pumping mains of DI pipes from CPS-1 to CPS-11 to different OHSRs including required specials & appurtenances etc complete.	5864.09
	CLUSTER DISTRIBUTION SYSTEM:	
6	Providing, Laying & Jointing of HDPE/DI distribution pipelines from cluster OHSRs to VTC/ CVC including required specials & appurtenances etc complete and construction of OHSRs & VTCs etc .	11045.12
	VILLAGE DISTRIBUTION SYSTEM:	
7	Providing, Laying & Jointing of HDPE/DI village distribution pipelines including required specials & appurtenances etc complete.	5346.49
	Subtotal (Part -B)	28,434.68
	PART -C: PUMPING STATIONS AND CLEAR WATER RESERVOIRS	
8	Provision for all required Electrical, mechanical and instrumentation works complete for Raw water pumping stations, TPS-1 to TPS-3 & CPS-1 to CPS-8 .	995.55
	(i) Mechanical Component (Rs.)	454.00
	(ii) Electrical Component (Rs.)	541.55
9	Construction of Pump Houses , staff quarters ,boundary wall and campus development works etc complete.	898.87
10	Construction of Clear Water reservoirs at locations of cluster Pumping stations TPS-1 to TPS-3 & CPS-1 to CPS-11	462.72
	SubTotal (Part -C)	2,357.14
	SUB TOTAL (A+B+C)	32,817.91
	PART -D : INSTRUMENTATION & SCADA	
11	Provision for instrumentation for all Pump stations, OHSRs & VTCs (with solar panel system for power) & SCADA for the entire project system	1,092.34
	(i) Instrumentation (Rs.)	617.34
	(ii) SCADA (Rs.)	475.00
	SUB TOTAL (Part-D)	1,092.34
	SUB TOTAL (A+B+C+D)	33,910.25
	PART -E : O & M	
12	Cost of operation and maintenance of the system for 10 year after defect liability period of one year @ 6.5% (except village distribution system)	1,856.64
	SUB TOTAL (Part-E)	1,856.64

Drinking Water Supply Project for 212 villages (77 villages of Sabla Block and 135 villages of Sagwara Block) including their 255 Other Habitations & 1 Town of Sagwara Block of District Dungarpur- DPR for A&F

S.No.	PARTICULARS	AMOUNT (Rs. In Lakhs)
	SUB TOTAL (A+B+C+D+E)	35,766.89
	<u>PART-F: DEPOSIT WORKS (POWER FEEDER,CROP/LAND COMPENSATION ETC):</u>	
13	Provision for fees to be deposited in various departments, crop compensation, land acquisition, forest clearance, road restoration etc.	1,000.00
14	Supply, Errection, Testing & Commissioning of OVERHEAD 33/11 KV Power Transmission Line with ACSR Conductor on Lattice Tower from different 33/11 KV GSS to various pumping stations as per AVVNL Standard.	347.33
15	Repair of Baneshwar Anicut at Baneshwar Dham -Capacity of anicut 310 Mcft and Year of construction 2007	956.38
	SUB TOTAL (Part-F)	2303.71
	SUB TOTAL (A+B+C+D+E+F)	38,070.60
	ADD 5% PROVISION FOR CONTEGENCIES	1,828.00
	ADD 11% PROVISION FOR PRORATA CHARGES ON STATE SHARE	2,870.27
	GRAND TOTAL (Rs in Lakhs)	42,768.87
	GRAND TOTAL FOR A&F SANCTION (Rs in Crores)	427.69


(Pradeep Kothari)
Executive Engineer
PHED Project Div.-II-Udaipur


(K C Meena)
Superintending Engineer
PHED Project Circle, Banswara


(S L Salvi)
Additional Chief Engineer,
PHED Project Region Udaipur

sd/-
(D K Gaur)
Chief Engineer (SP)
PHED GOR

Common Appendices C1 – C25 attached separately

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 Waste Water 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 construction waste / 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 fairs (melas)