

Initial Environmental Examination

Document Stage: Draft for consultation
Project Number: 42267-034
February 2023

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

Bharatpur 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
CPHEEO	–	Central Public Health and Environmental Engineering Organization
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
FCO	–	Fertilizer control ordinance
FSSM	–	Faecal 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
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
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

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 – C24 – 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.

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

New sewage treatment plant (STP) 9.4 MLD; treated effluent elevated reservoir (TEER), treated effluent storage reservoir (TESR); three new sewerage pumping stations (SPS) 0.81 MLD for Zone -1, 1.64 MLD for Zone-3, and 2.23 MLD for Zone -4 ; 81.53 km sewer lines including 11.6 km missing links, sewer networks; 3946 manholes and 3210 house sewer connections

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

Description of the Environment. Subproject components are in Bharatpur 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. Proposed SPSs will be constructed on vacant lands and STP will be constructed in existing STP campus. There are no trees on the site and is surrounded mostly by agricultural areas. Nearest wildlife protected area is the Keoladeo National Park (KNP), KPN was declared as World Heritage Site by UNESCO under the World Heritage Site Convention. KNP is situated in southern direction of town and all proposed components are proposed in northern direction of town. The nearest component to KNP is SPS1 about 2 km from boundary of national park. There are 5 ASI protected monuments in Bharatpur town which are: 1. Fateh Burj near Anah Gate, 2. Moat surrounding the fort wall comprising part of Khasra No. 1881, 3. Fort walls including Chowburja gate and approach bridges at the Chowburja and Ashtadhatu gates together with adjacent land comprised in part of survey plot No. 1881. 4. Jawahar Burj and Ashtadhatu Gate and 5. Delhi Gate (Outside fort). The nearest significant ASI site is the Moth wall Surrounding the fort at 572 m from SPS 1 and 450 m from sewer laying site, rest all protected monument are situated more than 500 to 5700 m distance from proposed subproject components.

Similarly, there are 11 State protected sites in Bharatpur. No project components are proposed near these protected monuments, nearest state protected monument is Chandpole gate and Goverdhan gate situated about 200 m and 310 m from sewer networks in zone 3. All other components are situated more than 600 m from monuments .

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 heritage buildings during laying of sewer networks in nearby roads. New STP of 9.4 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 in agricultural fields.

Potential impacts during construction are considered significant but temporary and are common impacts of construction in urban areas, and there are well developed methods to mitigate the same. Except laying of sewers, all other construction activities will be confined to the selected sites and the interference with the general public and community around is minimal. In these works, the temporary negative impacts arise mainly from construction dust and noise, hauling of construction material, waste and equipment on local roads (traffic, dust, safety etc.), mining of construction material, occupational health and safety (OHS) aspects. Pipe laying works will be conducted along public roads in an urban area congested with people, activities and traffic. Therefore, these works may have adverse, but temporary impacts arising mainly from the disturbance of residents, businesses and traffic due to construction work; safety risk to workers, public and nearby buildings due to deep trench excavations in the road; access impediment to houses and business, disposal of large quantities of construction waste etc. Trenchless method will be adopted for sewers deeper than 3.5 m and also at main road crossings in traffic areas. Subproject also includes adding missing links in the existing sewer system and may involve working on existing operational sewage lines. These works may present harmful working conditions due to accumulation of sewage, sludge and gases. Appropriate measures suggested including no manual working, supervisory control, safety equipment etc.,

Environmental Management. An environmental management plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable levels, along with the delegation of responsibility to appropriate agency. Various design related measures are already included in the project design. During construction, the EMP includes mitigation measures such as (i) proper planning and scheduling of sewer line works to minimize public inconvenience; (ii) measures to avoid impacts on heritage building and chance find procedures (iii) barricading, dust suppression and noise control measures; (iv) traffic management measures for works along the roads and for hauling activities; (v) occupational and community health and safety, labour welfare, (vi) provision of walkways and planks over trenches to ensure access will not be impeded; (vii) reuse of excavated materials to extent possible, (viii) spill and sediment control measures to avoid water and soil pollution, etc., EMP will guide the environmentally-sound construction of the subproject. EMP includes a monitoring program to measure the effectiveness of EMP implementation and include observations on- and off-site, document checks, and interviews with workers and beneficiaries. A copy of the updated EMP/ site environmental management plan (SEMP) shall be kept on-site during the construction period at all times. The EMP will be included in bids and contracts, and implementation shall be binding on contractors. There are no gaps

identified in regulatory compliance at existing STP in the environmental audit. Existing STP already has valid Consent to operate (CTO) from Rajasthan Pollution Control Board (RPCB).

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 6 places along with proposed alignment with about 70 persons in month of July and December 2021. 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 Bharatpur will be the major beneficiaries. The subproject is primarily designed to improve environmental quality and living conditions of Bharatpur town through provision of sewerage. The benefits arising from this subproject include: (i) better public health particularly reduction in waterborne and infectious diseases; (ii) reduced risk of groundwater contamination; (iii) reduced dependence on freshwater resource due to reuse of treated wastewater, and (iv) 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. PMU needs to ensure that CTO is obtained for existing STP.

I. INTRODUCTION

A. Rajasthan Secondary Town Development Section Project – Additional Financing

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

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

- (i) **Output 1: Resilient water supply systems developed or improved.** By 2028, the project will (i) At least 1,300 km of water supply pipelines will be commissioned through a district-metered area approach for effective non-revenue water (NRW) management, (ii) at least 79,000 households will be connected to an improved water supply system, including at least 95% below poverty line households, with 100% functional meters allowing for the introduction of volumetric billing, (iii) three new water treatment plants (WTPs) will be commissioned with a total capacity of at least 24 million liters per day (mld).
- (ii) **Output 2: Resilient and inclusive sanitation systems developed or improved.** By 2028, (i) at least 500 km of sewers will be constructed; (ii) seven sewage treatment plants (STPs) with co-treatment of wastewater and fecal sludge and with a total capacity of at least 30 mld will be commissioned and one existing STP with 10 mld capacity will be upgraded to meet current effluent standards; and (iii) at least 54,000 new household connections (including at least 95% below poverty line households) to the sewer system will be installed.
- (iii) **Output 3: Urban assets to enhance climate resilience and heritage living developed or improved.** By 2028, (i) at least 50 km of drainage networks will be constructed in five ULBs; (ii) at least five either kunds or baories rehabilitated and/or reconstructed in three ULBs that were heritage structures built for drainage, rainwater harvesting, and reuse, but currently are not properly functioning; (iii) five water parks rehabilitated in one ULB to enhance water retention and storage capacity and/or to improve people's well-being, both residents and visitors; and (iv)

at least four heritage structures are refurbished in five ULBs to improve the living environment and attract more tourists.

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

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

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

B. Purpose of Initial Environmental Examination Report

5. Per ADB's Safeguards Policy Statement, 2009, ADB requires the consideration of environmental issues in all aspects of the Bank's operations. Using rapid environmental assessment (REA) checklist (Appendix 1), subproject is unlikely to cause significant adverse impacts, and classified as category B and per ADB SPS requirements this IEE is conducted. Subproject selection confirms with EARF environmental criteria (**Appendix 8**)

C. Scope of IEE

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

D. Report Structure

7. This Report contains the following sections:

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

II. DESCRIPTION OF PROJECT

A. Project Location

8. **Bharatpur Town:** Bharatpur, also known as 'Eastern Gate of Rajasthan', is located in the

Braj region 180 km away from Delhi. Geographically, the district is situated between 26° 22' and 27° 83' N and 76° 53' and 78° 17' E and its average height above sea level is around 183 m. Bharatpur city is the district headquarters and is also known by the name of Lohagarh. It is situated very close to the main cities of Rajasthan and other states. Distance between Jaipur and Bharatpur is around 178 km whereas Agra lies at a distance of 55 km from the district. Mathura is located at a distance of 34 km. Bharatpur touches Gurgaon of Haryana in the north, Mathura in the east, Agra of Uttar Pradesh and Dholpur of Rajasthan in the south and Dausa and Alwar in the west.

B. Existing Sewerage System

1. Sewerage Network

9. At present, most of the Bharatpur town is covered with sewage networks and house service connections are being done for most of the house. Two projects have already been executed in town, one under RUIDP, Phase-2 (Funded by ADB) and other under the government-funded Atal Mission for Rejuvenation and Urban Transformation (AMRUT). Details of the coverage under both the schemes are as below.

10. **Sewer lines laid under RUIDP Phase-2.** This was the first sewerage project in town. Executing agency for this project was Rajasthan Urban Infrastructure Development Project (RUIDP) with external funding from ADB. This project was already completed and commissioned, with the following components:

- (i) Laying of sewerage network laterals and main line in core and densely populated areas of the city. It is intended that areas located between circular road and Sujan Ganga are covered in the phase 1 full or part of municipal ward no Ward No 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, will be covered. Population residing in and around Anah Gate, Khumer Gate, Patpara Mohalla, Neem Darwaja, Neemda Gate, Laxman Mandir, Atal Bandh, Ahir Mohalla, Radha Krishna Colony, Jama Masjid, Ganga Mandir, Mathura Gate, Sirki Wale Hanumanji, BeNarain Gate, Chaudah Mahadev Madir, Gulal Kund, Suraj Pole Chauraha, Girls College, Museum, Fort, Nadia Mohalla, Namak Katara, Jayanti Nagar, Delhi Gate, Red Cross Circle, Sahyog Nagar, Govardhan Gate, Gopah Gharh, Jagina Gate has benefitted from this RUIDP Phase-2 project;
- (ii) Laying of Outfall Sewer and Trunk Mains of sizes ranging from 700 mm to 1900 mm dia. and aggregate length of 11,962 m;
- (iii) Laying of Sub-Mains and laterals of sizes ranging from 200 mm to 600 mm dia. and aggregate length of 65,977 m. This also includes 3,865 nos. of property connections;
- (iv) Laying of 900 mm dia. pumping main of GRP for a length of 1,100 m from sewage pumping station to 8 MLD STP;
- (v) Construction of one module (out of 2 modules) of sewage pumping station with capacity of 24 MLD near hotel The Bagh;
- (vi) Construction of 8 MLD Sewage Treatment Plant (STP) based on SBR process; and
- (vii) Catchment coverage of approximately 1,137 Ha area (out of 5614 Ha).

11. **Sewer lines laid under AMRUT 1.0.** The second sewerage project executed in Bharatpur is under the AMRUT Scheme. Executing agency for this project is the Municipal Corporation, Bharatpur and coverage under this project is as follows:

- (i) Laying sewerage network for areas that are not covered under RUIDP, Phase-2, This includes covering partly or fully Ward Nos. 9, 19, 20, 36, 37, 38, 39, 40, 41, 42, 43, and 44;
- (ii) Installation of 15,186 nos. house sewer connections, out of which 5,415 nos. has been connected to sewerage network while the balance is still to be completed; and
- (iii) Construction of 5 MLD capacity Sewage Treatment Plant based on SBR process near Village Ikran adjacent to existing STP that was constructed under RUIDP Phase-2.

2. Sewerage Treatment

12. There are 2 nos. existing STPs with capacity of 5 & 8 MLD capacity based on SBR technology. 8 MLD STP was constructed in RUIDP Phase-II while 5 MLD STP was constructed in AMRUT Phase-I. 2 new STPs of 9.4 MLD and 7.7 MLD are proposed in RUIDP, Phase-IV and AMRUT 2.0 respectively. Thus, there will total capacity of STPs up to the year of 2040 will be 30.1 MLD (8+5+9.4+7.7).

C. Proposed Subproject

13. **Sewerage Works.** Under RSTDSP-AF, it is proposed to develop a sewerage system in Bharatpur town to collect, treat, and dispose/reuse the domestic wastewater safely. The proposal includes a combination of underground sewerage system/network, sewage treatment plant (STP), and Fecal Sludge and Septage Management (FSSM) system in areas that are not fully developed at present and not feasible to provide sewer network. 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 operation and maintenance to minimize lifecycle costs.

14. The sewer system will be designed as a separate sewer system that carries only the domestic/municipal wastewater. The open drain system that exists in the town will cater to storm runoff. No industrial wastewater will be allowed into the sewers. This subproject complies with the environmental subproject selection criteria agreed between the government and the ADB.

15. **Proposed Components.** The proposed subproject will have the following components:

- (i) Laying of sewer network with total length of 81.53 km pipe diameters in the range of 200 mm to 400 mm, including 11.6 km missing links, 6.0 km trenchless sewer lines of HDPE PN6 & HDPE DWC SN8 pipes; construction of 3,946 nos. manholes; and installation of 3,210 nos. house sewer connections;
- (ii) Laying of pumping mains of 1,870 m length;
- (iii) Construction of three sewage pumping stations (SPS) with capacities of 0.81 MLD for Zone -1, 1.64 MLD for Zone-3, and 2.23 MLD for Zone -4;
- (iv) Construction of new STP with capacity of 9.4 MLD employing SBR technology; and
- (v) Setting up of fecal sludge and septage management (FSSM) for low density population areas.

1. Sewer Network

16. Based on the site feasibility and town topographical survey done by the Municipality, the estimated aggregate length required for the sewer network is about 81.53 km, including 11.6 km missing links, 6.0 km trenchless laying sewer lines in Bharatpur Town. New networks are proposed for Zone 1,3, and 4. The proposed sewer network will be laid on government-owned lands. No alignment will pass through forest land or private land that would require land acquisition.

Table 2: Details of Proposed sewer networks

Sewer Pipe Dia	Type of Pipe	Length (m) Depth wise					Total Length (m)
		up to 1.5	1.5 -3.0	3.0 - 4.5	4.5 - 6.0	6.0 - 7.5	
200 MM	HDPE DWC SN8	39586.80	30342.60	4130.80			74060.20
250 MM	HDPE PE-100/PN-6			3093.10	304.10	37.30	3434.50
250 MM	HDPE DWC SN8		299.90	594.10			894.00
300 MM	HDPE DWC SN8			70.50			70.50
315 MM	HDPE PE-100/PN-6			766.90	986.80	53.40	1807.10
400 MM	HDPE PE-100/PN-6			241.30	530.20		771.50
Total		39586.80	30642.50	8896.70	1821.10	90.70	81037.80

2. Sewage Pumping Station (SPS) and Pumping Main

17. There are three nos. sewage pumping station (SPS) that will be built under the subproject. These SPSs will have capacities of 0.81 MLD, 1.64 MLD and 2.23 MLD.

18. SPS-1 is proposed for Zone-1. It will have a capacity of 0.81 MLD and will be constructed on a government-owned land near Nai Mandi circular road Tiraha. This land has an area of 4700 m², and the pumping station will occupy about 500 m² of this area. The site is surrounded by Ranjeet Nagar Flood Canal and houses on north and Mathura- Bharatpur Road on south.

19. SPS-3 is proposed for Zone 3. It will have a capacity of 1.64 MLD and will be constructed on a land owned by the Urban Improvement Trust (UIT) near Mukherjee Nagar Pulia, abundant PNT Quarters, Bharatpur. The land has an area of 6,800 m², and the pumping station will occupy 600 m² of this area.

20. SPS-4 is proposed for Zone-4. It will have a capacity of 2.23 MLD and will be constructed at Deeg road workshop yojna in front of Vaishali agency, Bharatpur. The land is likewise owned by the Urban Improvement Trust (UIT). The site is accessible through Bharatpur Marg and Mathura Bypass Road.

Table 3: Details of Proposed SPS

SPS	2025	2040	2055	Zone & Node No.	Incoming Sewer Dia	IL(m)	GL(m)
SPS-1	0.46	0.63	0.81	ZONE-1, PMP-1	400 mm, HDPE	166.54	172.23
SPS-3	0.94	1.29	1.64	ZONE-3, PMP-3	400 mm, HDPE	167.41	172.12
SPS-4	1.26	1.74	2.23	ZONE-4, PMP-4	400 mm, HDPE	167.03	172.57

3. Pumping Mains

21. The proposed pumping mains will transfer sewerage from SPS to STP. Details are provided in table below.

Table 4: Proposed Pumping Mains

Origin	Diameter	Length (m)	Discharge Zone No.	GL of Discharge Point (m)	Sewer Dia at Discharge Point
SPS-1	200 mm DI K-9	50	ZONE-1, OUTLET PMP-1	174.86	1400 mm RCC
SPS-3	250 mm DI K-9	820	ZONE-3, OUTLET PMP-3	174.95	1400 mm RCC
SPS-4	300 mm DI K-9	1000	ZONE-4, OUTLET PMP-4	175.36	1100 mm RCC

4. Sewage Treatment Plant (STP)

22. Presently, there are two STPs in operation. These are the 8.0 MLD and 5.0 MLD STPs constructed under previous phases of RUIDP. These are located at Ikran Village in Bharatpur town. For the subproject, additional new STP of 9.4 MLD capacity based on SBR process is proposed. This new proposed STP will be constructed along with TESR and TEER with 22 m staging land in the same campus/compound of the existing STPs. The land is a government-owned land under ownership of Nagar Nigam and has an area of 7,300 m². The proposed STP will occupy about 7,000 m². The site is accessible through the Agra- Bharatpur state highway.

Table 5: Sewage Generation for Different Horizon Years (under Proposed AMRUT 2.0 area including existing area & RUIDP Phase-IV area)

Population Projection			Sewage Generation (MLD)			Location of STP	Incoming Sewer Dia at STP
(Number)	2025	2040	2025	2040	2055		
229259	265516	302399	26	30.1	34.3	At Campus of Existing STP near Village Ikran	1600 mm, RCC

23. Currently, there is a total of 13 MLD sewage treatment capacity for the town. But per estimate, the town will require sewage treatment capacity of 26 MLD by the year 2025 and 30.1 MLD by 2040. The proposed 9.4 MLD STP will partially fill the envisaged capacity deficit.

Accordingly, AMRUT Phase 2 is also preparing to build a new 7.7 MLD STP to fully satisfy the ultimate total capacity requirement by 2040.

24. At present, sewage in 24 MLD PTU is coming through 900 mm GRP pumping main from 24 MLD SPS nearly 1000 m away from the existing STP location.

5. House Sewer Connections

25. The subproject will also include the installation of 6,027 nos. of house sewer connections (3210: Phase-IV Area + 2817: RUIDP, Phase-II Area), including pre-cast RCC M-40 grade circular roadside inspection chambers outside building line and 110 mm and 160 mm dia PVC-U pipeline for collection of sewage from roadside inspection chambers outside building line to street manhole. A total 6460 nos. house connections are proposed.

6. Manholes

26. Manholes provide access to sewers for inspection and cleaning. Manholes are located at every change of alignment, grade, or diameter, at the head of all sewers and branches and at every junction of two or more sewers. Spacing of manholes depends upon type of sewer cleaning equipment and on the methodology of whether manual cleaning or use of mechanical devices is needed. On sewers, which are to be cleaned manually but could not be physically accessed for cleaning or inspection, the maximum distance between manholes have been adopted as per the CPHEEO manual. Total number of proposed manhole is 3,946.

Table 1: Depth wise details of Manholes

Sewer Dia	Type of Pipe	up to 1.5 m	1.5 -3.0 m	3.0 - 4.5 m	4.5 - 6.0 m	6.0 - 7.5 m	Total MH (Nos)
200 MM	HDPE DWC SN8	1907	1488	202			3597
250 MM	HDPE PE-100/PN-6			154	16	2	172
250 MM	HDPE DWC SN8		17	28			45
300 MM	HDPE DWC SN8			4			4
315 MM	HDPE PE-100/PN-6			38	52	2	92
400 MM	HDPE PE-100/PN-6			11	25		36
Total		1907	1505	437	93	4	3946

27. **Reuse of treated effluent.** The Rajasthan State Sewerage and Wastewater Policy, 2016, promotes the reuse of treated sewage for non-potable applications, and also to make sewerage projects environmentally sustainable. This policy:

- (i) aims 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;
- (ii) promotes the reuse and provides guidance on the same;
- (iii) prioritizes reuse in irrigation (agriculture, forestry, and landscaping), followed by fish farming, industry and non-potable domestic reuse;
- (iv) requires monitoring of treated wastewater quality, soil quality etc.;

- (v) prohibits artificial recharge of aquifers using treated wastewater, and promotes construction of storage tanks to store treated wastewater to facilitate reuse;
- (vi) prescribes that the detailed project report (DPR) of a sewerage project should clearly define the best reuse option specific to the town and prepare a reuse action plan part of the DPR duly following the water quality norms and legal implications; and
- (vii) suggests use of sludge produced from the treatment as fertilizer and soil conditioner after processing.

28. To further the implementation of the Policy, promote the reuse of effluent, and provide guidance to the stakeholders, the LSGD is currently in the process of publishing "Guidelines for Reuse of Treated Wastewater in Rajasthan, 2019. These guidelines:

- (i) promote 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; and
- (ii) promotes the use of treated wastewater as an economic resource.

29. Under the subproject, following the State Policy, treated effluent will be reused in applications such as agriculture, horticulture, development of urban forestry and industry, as appropriate. A Treated Effluent Reuse Plan will be prepared by the DBO Contractor during the detailed design phase as envisage by the State Policy, and reuse modalities will be firmed up. To facilitate reuse and supply of treated effluent, a TESR, effluent pumping station and a TEER are proposed at the STP in the subproject. Total storage capacity of TESR and TEER at each STP is 15% of respective STP treatment capacity. Treated effluent will be chlorinated prior to its entry into TESR/TEER.

30. **Discharge of Treated Effluent:** For storage of treated water TESR of Capacity 770 KI and TEER of Capacity 385 KI at 22 m Staging will be developed. During rainy season and in case of low demand for treated effluent reuse, remaining effluent will be disposed by gravity nearby into "Bharatpur City Flood Control Drain. This flood control drain is 500m away from STP site.

31. **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. More specific discussion on sludge treatment process and disposal scheme are included in Section V of this IEE report.

7. Fecal Sludge and Septage Management

32. Fecal Sludge and Septage Management (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 Faecal Sludge and Septage Management. These pockets /areas are having the population density less than the density required to generate the sewage in sufficient quantity for piped sewer network. However, sewer network has been designed including these areas so that in future whenever required sewer network can be laid.

33. Under the FSSM, faecal sludge / septage will be collected from the household level septic tanks using truck mounted mobile desludging equipment and transported to STP for treatment. 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. **Municipal Area Proposed Under 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, will make septage collection, treatment and effluent management environment- friendly. Details of area covered in FSSM is given below.

Table 6: Details of Proposed FSSM in town

Ward No.	Total Area	Habitat on Area*	Other than Habitat on Area	Census Population	Projected Population			Density per hectare on Total Area		Density per hectare on Habitation Area		
	Ha.	Ha.		2011	2040	2055	2025	2040	2055	2025	2040	2055
8	483.69	59.88	423.81	3309	8747	11632	12	18	24	99	146	194
46	99.84	64.58	35.26	3853	8890	11562	63	89	116	97	138	179
49	484.48	186.04	298.44	4623	16716	23131	21	35	48	56	90	124
51	263.58	78.38	185.2	4318	9773	12666	26	37	48	88	125	162
57	104.24	66.54	37.7	3595	9157	12108	60	88	116	94	138	182
58	1166.1	244.33	921.77	4558	20667	29212	11	18	25	50	85	120

35. **Table 7** shows the nature and size of the various civil works components of this sewerage subproject in Bharatpur Town. Google Coordinates of proposed work sites are given in **Table-2**. Locations of subproject components on Google Map and Topo Sheet are shown in **Figures 1 to 4**, and conceptual layout plans and network alignments.

36. Operation and maintenance (O&M) of FSSM. The DBO contractor will operate and maintain the system for a period of 10 years. This will include the following:

- (i) Desludging the septic tanks / pits from the individual houses using mobile truck mounted desludging equipment
- (ii) Transportation of the vehicle to STP, dispose-off septage to Inlet chamber/screen chamber of STP,
- (iii) Cleaning of the tank, and proper garaging of the vehicle at designated place.

Table 7: Proposed Scope of Work in Bharatpur Town

Component	Function	Description	Location & Ownership
Sewer Collection networks including Manholes and House sewer connections	Collect wastewater from houses and convey by a combination of gravity and pressure pumping to pumping station and ultimately to the STP	Laying of total 81.53 km length of 200 mm to 400 mm dia including 11.6 km missing links, 6.0 km trenchless sewer lines HDPE PN6 & HDPE DWC SN8 pipes Manholes 3946nos House sewer connections (3210 numbers)	Sewers will be laid underground in the roads and internal streets in the town. Sewers will be located in the centre of the road. The existing/proposed water pipes are/will be located on one or either side of the roads, and therefore sewers will be laid in the centre without distributing the water pipes.
Pumping Main	Transfer of wastewater from pumping station to nearest existing Pumping main to STP	New - Total length: 1870 m SPS1 - 200 mm DI K-7 dia, 50 m SPS3- 350 mm DI K-7 dia 820m SPS4 350 mm DI K-7 dia 1000 m	Within existing ROW
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.	Construction of 3 nos. of SPS. 0.81 MLD Zone 1 1.64 MLD Zone 3 2.23 MLD Zone 4	Location: Zone – Zone 1,3 & 4 Ownership: Nagar Parishad

Component	Function	Description	Location & Ownership
Sewage Treatment Plant (STP-01) (Including provision of Co-treatment of Faecal Sludge)	Treatment of collected wastewater to meet stipulated discharge standards	<i>New – STP</i> 9.4 MLD Components - SBR (sequential batch reactor) based STP with primary, secondary, tertiary treatment - Disinfection of treated wastewater for reuse – chlorination tank - sludge management (sludge collection, thickening, dewatering and disposal) - Laboratory, and online testing facilities for BOD, COD, TSS etc.,) - Instrumentation, automation, SCADA etc Discharge of Treated Effluent: For storage of treated water TESR of Capacity 770 KI and TEER of Capacity 385 KI at 22 mtr Staging will be developed. In rainy season of in case of low demand remaining effluent will be disposed by gravity nearby into “Bharatpur City Flood Control Drain” which is 500 m away from STP site.	Location: 9.4 MLD- near Ikran Village Ownership: Nagar Parishad
Pipe networks for transfer of treated effluent	Collect wastewater from houses and convey by a combination of gravity and pressure pumping to pumping station and ultimately to the STP	10.0 km pipe networks for distribution of treated effluent for reuse such as in agriculture- Material- HDPE PE-100/PN6 200 dia- 10 km	Within existing road ROW
FSSM			
Truck mounted mobile desludging equipment	Desludging of septage from household pits/ septic tanks, transportation, and discharge to STP	mobile tankers with suction and discharge arrangements – number of tankers to be procured will be estimated during the detailed design	Mobile equipment

Table 8: Coordinates of Sub Project Locations

COMPONENTS	Latitude	Longitude
Proposed STP 9.4 MLD site, Nagla Gopal	27°12'17.14"N	77°32,47.57" E
Proposed SPS site	SPS-1: 27°13'38.9" N SPS-3: 27°13'39.57" N SPS-4: 27°13'28.95" N	77°29'59.86" E, Zone-1 77°29'29.97" E, Zone-2 77°28'57.39" E, Zone-3
Discharge/Disposal Point of Treated Wastewater from proposed STP site	27°12'24.65"N	77°32'43.72"E

37. **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 Bharatpur; and
- (vii) Maintaining environmental norms at entire system components.

38. **Existing Facilities:** The collected sewage will be transferred from SPS to STP campus via existing pumping mains. This collected sewer will get treated at existing STP of 8 MLD and newly proposed STP of 9.4 MLD. The existing 8 MLD STP is based on SBR and treating sewerage as per latest government requirement. The Environmental Audit report of Existing 8 MLD STP is presented in Appendix 25 of this IEE.

Figure 1: Location of Proposed STP (9.4 MLD) site, Nagla Gopal near Ikran village in Google Earth



Figure 2: Layout of Existing and Proposed STP

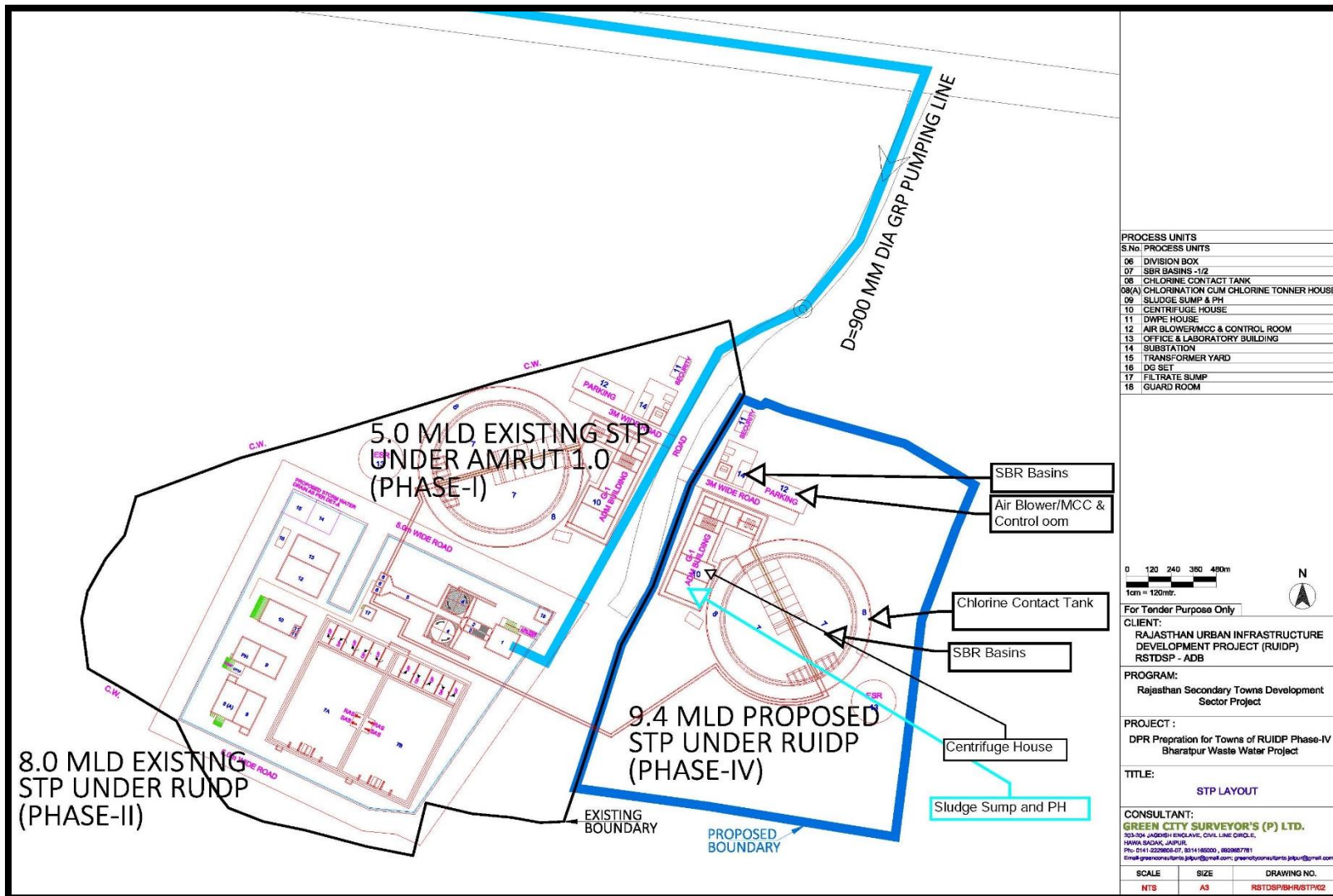


Figure 3: Location of Proposed SPS's locations at Bharatpur in Google Map



Figure 4: Location of Proposed SPS 1 locations Google Map



Figure 5: Location of Proposed SPS 1 locations Google Map



Figure 6: Location of Proposed SPS 1 locations Google Map



Figure 7: Proposed Sewer Zone in RUIDP Phase 4 (Zone -1 in blue ink, Zone-3 in Yellow Ink and Zone 4 in Green Ink)

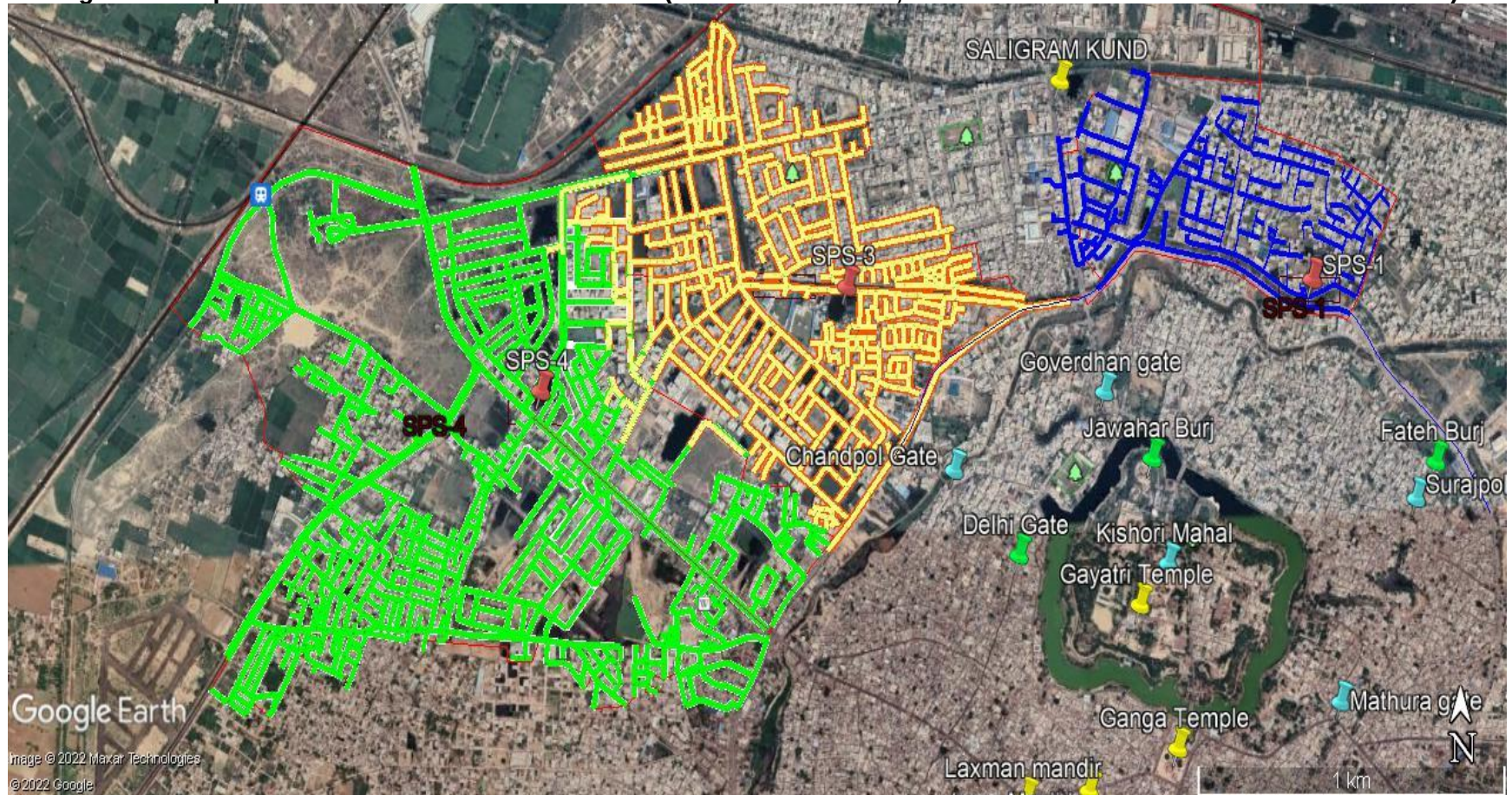
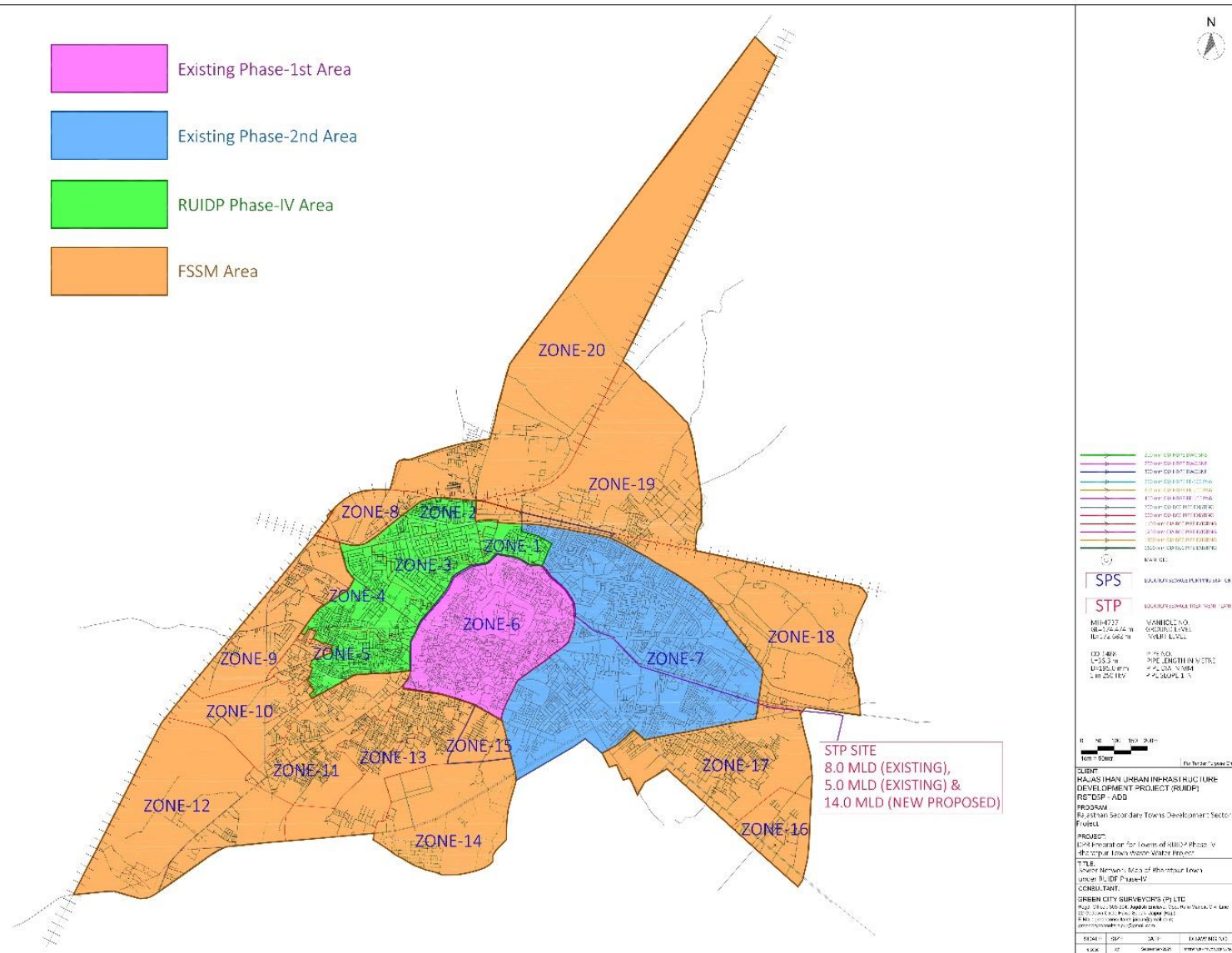


Figure 8: Layout of Proposed Sewer Networks and FSSM areas



D. Subproject Benefits

39. The subproject is primarily designed to improve environmental quality and living conditions of Bharatpur Town through provision of sewerage. The benefits arising from this subproject include: (i) better public health particularly reduction in waterborne and infectious diseases; (ii) reduced risk of groundwater contamination; (iii) improvement in quality of water bodies due to disposal of treated effluent meeting disposal standards.

40. The subproject will improve the efficiency of existing and new proposed sewer network, improve sanitary conditions within the city area, increase flow to avoid chocking of sewer line, reduce the water and air pollution near existing lake by trapping wastewater in the sewer than letting it flow open; improve water quality in existing lake as household sewer connections will collect sullage to sewer line.

E. Implementation Schedule

41. After the completion of preliminary designs, bids were and contract awarded to successful bidder in November 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.

42. Subproject is proposed for implementation under DBO modality, wherein which the successful bidder will design the sewerage systems and components (based on the feasibility/preliminary design/standards/guidelines provided in the bid document), construct, commission, and operate for 10 years, after which it will be transferred to Bharatpur Municipality. Therefore, at this stage, subproject is designed only in outline, and the details of components of the subproject provided in the **Table-1** are as finalized at this stage based on the preliminary designs and as included in the bid documents. This IEE is based on the subprojects and components detailed in the **Table-1**, and the IEE will be further updated during the detailed design phase.

III. ANALYSIS OF ALTERNATIVES

43. The ADB SPS, 2009 requires an analysis of project alternatives to determine the best method of achieving project objectives (which is safely collecting and disposing the human waste generated, in Bharatpur City, 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.

44. The proposed Sewerage subproject component in Bharatpur includes sewage collection network, transmission, treatment and treated wastewater reuse and disposal. Descriptions of various alternatives considered for critical components such as 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	Bharatpur subproject is proposed to improve the service levels of basic infrastructure – sewerage. Bharatpur There are two existing STP of 8 & 5 MLD capacity based on SBR technology near Ikran village. 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) better public health particularly reduction in waterborne and infectious diseases; (ii) reduced risk of groundwater contamination; (iii) 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	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 (UASBR) + FAL; Conventional Activated Sludge Process; 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><100 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</td><td>can only be used for low</td><td>can only be used for low</td><td>Can be used for low end</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	<100 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	can only be used for low	can only be used for low	Can be used for low end
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																																													
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		usages like flushing and gardening tertiary treatment required for high and usages like construction water, industrial usages, cooling water etc.	end usages like flushing and gardening tertiary treatment required for high and usages like construction water, industrial usages, cooling water etc.	end usages like flushing and gardening tertiary treatment required for high and usages like construction water, industrial usages, cooling water etc.	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
	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 (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 border="1"> <thead> <tr> <th>Parameter</th><th>Standards</th></tr> </thead> <tbody> <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> </tbody> </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)
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)														
4	Treated wastewater disposal														
Type of alternative	Treated wastewater disposal – reuse applications														
Description of alternatives	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 sites, 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 stream located near STP site														
5	Project Locations														
Description of alternatives	STPs location. Based on the technical feasibility of gravity flow system, sewerage system in Bharatpur is designed and optimized with two sewage treatment plants (STPs). 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. The two selected sites are away from habitations and surrounded by agricultural lands (no habitations within 250 m from STP sites proposed at Nagla Gopala near Ikran village). As far as possible sufficient distance from proposed STPs from habitation is desirable, and also considering the selected														

	superior and compact sewage treatment technology (SBR), the two sites which are selected are suitable for the construction of STPs and therefore no site alternative is considered. Sewer lines. Sewer line is proposed along the roads/streets in the town within the road right-of-way (ROW). In wider roads water pipes will be laid in the road shoulder beside the tarmac, and in narrow roads, where there is no space, pipes will be laid in the road carriage way by break opening the tarmac. Sewers will be mostly laid in the center of the road, away from water pipes. There are existing asbestos cement pipes underground in the existing water supply networks, the alignment will be fine-tuned during the detailed design, to avoid existing AC pipe alignments as far as possible. SPS Locations. Sewage pumping station is proposed in vacant government land on the basis of drainage pattern of town, availability of government land with no any other use, adequate land parcel, site away from habitation etc. Nearest habitation is about 25 m away from site, therefore this site is suitable for construction of proposed SPS and no site alternative is considered. Disposal Point: After utilising the treated wastewater for non-potable uses, the excess water will be disposed at Bharatpur City Flood Control Drain for further use in agriculture by downstream users. The proposed land for disposal is govt. land. There is no habitation within 120 m radius.
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IV. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORKS

A. ADB Safeguard Policy (SPS 2009)

45. 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.

46. 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.

47. The environmental impacts of Bharatpur sewerage subproject have been identified and assessed as part of the planning and design process. An environmental assessment using ADB's REA checklist for sewerage treatment (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.

48. **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.

49. **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. The Preliminary Environmental audit report of existing STP is given in **Appendix 25**.

50. **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.

51. **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.

52. **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

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.

risks and adverse impacts of the subproject.

53. 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.

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

55. 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.

56. 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.

57. 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.

58. ADB SPS International Best Practice Requirements. ADB SPS, 2009 requires that,

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.

during the design, construction, and operation of the project, the executing agency shall apply pollution prevention and control technologies and practices that are consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety (EHS) Guidelines. (IFC's General EHS Guidelines⁴ and Sector Specific [Water and Sanitation] Guidelines⁵). These standards contain performance levels and measures that are normally acceptable and applicable to projects. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of India regulations differ from these levels and measures, the PMU and PIUs will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the PMU and PIUs will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS, 2009.

B. National Laws

59. 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.

60. **Environmental assessment.** The Government of India's EIA Notification of 2006 and its amendments (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.

61. **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.

62. **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.

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

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

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

64. **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 below**.

C. Environmental Regulatory Compliance

65. **Table 10** presents a summary of environmental regulations and mandatory requirements applicable to Bharatpur Town sewerage 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,	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,	All phases of project

Law	Description	Requirement	Relevance to Project Phase
	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	control of raw water pollution¹⁸, reuse and recycling. Avoid/minimize use of forest lands. With reference to climate change adoption and mitigation following should be considered in the project: (i) diminishing flows in surface water bodies, and groundwater depletion, and revival traditional water bodies as water sources (lakes/tanks); (ii) equal stress on demand side management in water; and (iii) minimize energy use - design energy efficiency systems.	
EIA Notification, 2006 and amendments	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	Designed One STPs 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
	conditions imposed in consent issued under provision of the Water (Prevention and Control of Pollution) Act of 1974. These conditions regulate the quantity and quantity of effluent, the location of discharge and the frequency of monitoring of effluents. Any component of the subproject having the potential to generate sewage or trade effluent will come under its purview. Such projects have to obtain Consent to establish (CTE) under Section 25 of the Act from Rajasthan State Pollution Control Board (RSPCB) before starting implementation and Consent to Operate (CTO) before commissioning.		
Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments.	This Act was enacted to achieve prevention, control and abatement of air pollution activities by assigning regulatory powers to Central and State boards for all such functions. The Act also establishes ambient air quality standards. The projects having potential to emit air pollutants into the atmosphere have to obtain CTE and CTO under Section 21 of the Act from RSPCB. The occupier of the project/facility has the responsibility to adopt necessary air pollution control measures for abating air pollution.	The following will require CTE and CTO from RSPCB: (i) Diesel generators (more than 15 KVA); (ii) Batching Plant hot mix plants; and (iii) stone crushers, if installed for construction. All relevant forms, prescribed fees and procedures to obtain the CTE and CTO can be found in the RSPCB website (http://environment.rajasthan.gov.in) If ready mix concrete and hot mix bitumen is procured from third party, contractor has to ensure that the plants, from where material is being purchased is having CTE/CTO and copy should be collected from third party and submitted in PIU	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	Not Applicable	-

Law	Description	Requirement	Relevance to Project Phase
	resources and knowledge to the country and the people.		
Wildlife Protection Act, 1972 and amendment 1991	This overarching Act provides protection to wild animals, birds, plants and matters connected with habitat protection, processes to declare protected areas, regulation of wildlife trade, constitution of state and national board for wildlife, zoo authority, tiger conservation authority, penalty clauses and other important regulations.	None of the components of the subproject are located within the protected Area. Therefore, this act is not applicable.	Not Applicable
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 2 provides ambient air quality standards, Appendix 6 provides emission limits for vehicle exhaust and Appendix 2B provides emission limits of DG sets and Appendix 2A provided emission stack height requirements for diesel generators Appendix 4 provides STP discharge standards	Construction and operation
Noise Pollution (Regulation and	Rule 3 of the Act specifies ambient air quality standards in	Appendix 3 provides applicable noise standards	Construction and operation

Law	Description	Requirement	Relevance to Project Phase
Control) Rules, 2000 amended up to 2010.	respect of noise for different areas/zones.		
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 7 provides drinking water standards	Construction and operation
Solid Waste Management Rules 2016	Responsibility of Solid Waste Generator segregate and store the waste generated in three separate streams namely bio-degradable, non-biodegradable and domestic hazardous wastes in suitable bins and handover segregated wastes to authorized waste pickers or waste collectors as per the direction or notification by the local authorities from time to time; store separately construction and demolition waste, as and when generated, in his own premises and shall dispose off as per the Construction and Demolition Waste Management Rules, 2016; (iii) No waste generator shall throw, burn or bury the solid waste generated by him, on streets, open public spaces outside his premises or in the drain or water bodies.	Contractor to follow all the rules during construction works	Construction and operation
Construction and Demolition Waste Management Rules 2016	(i) Every waste generator shall segregate construction and demolition waste and deposit at collection centre or handover it to the authorized processing facilities (ii) Shall ensure that there is no littering or deposition so as to prevent obstruction to the traffic or the public or drains (iii) Large generators (who generate more than 20 tons or more in one day or 300 tons per project in a month) shall submit waste management plan and get appropriate approvals from the local authority before starting construction or demolition or remodelling work,	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.	Construction

Law	Description	Requirement	Relevance to Project Phase
	(iv) Large generators shall have environment management plan to address the likely environmental issues from construction, demolition, storage, transportation process and disposal / reuse of C & D Waste. (v) Large generators shall segregate the waste into four streams such as concrete, soil, steel, wood and plastics, bricks and mortar, (vi) Large generators shall pay relevant charges for collection, transportation, processing and disposal as notified by the concerned authorities;		
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	Contractor to comply all the requirements of this Act during construction works. STP Sludge or any material if classified as hazardous waste / material is to be handled and disposed according to this Rules	Construction and operation

Law	Description	Requirement	Relevance to Project Phase
	facility shall give to the operator of that facility, such specific information as may be needed for safe storage and disposal. (6) The occupier shall take all the steps while managing hazardous and other wastes to- 6 (a) contain contaminants and prevent accidents and limit their consequences on human beings and the environment; and (b) provide persons working in the site with appropriate training, equipment and the information necessary to ensure their safety.		
Wetlands (Conservation and Management) Rules, 2017	The Rules specify activities which are harmful and prohibited in the wetlands such as industrialization, construction, dumping of untreated waste and effluents, and reclamation. The Central Government may permit any of the prohibited activities on the recommendation of Central Wetlands Regulatory Authority.	Not applicable as subprojects components are not located in or near to designated wetland area.	Not applicable
Ancient Monuments and Archaeological Sites and Remains Act, 1958 and Ancient Monuments and Archaeological Sites and Remains (Amendment and 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	Not applicable - there are no state protected monuments in the town Re-assessment will be required after confirmatory survey during pre-construction phase and for the proposed works identified within core area or regulated areas of these monuments, permission from State Archaeological Department will be required before start of	Not applicable

Law	Description	Requirement	Relevance to Project Phase
	completion, procedures to be followed during the work and for chance finds et-.	construction works. In case of chance finds, the contractor/PIU will be required to follow chance finds protocol (Appendix 24)	
The Building and Other Construction Workers (BOCW) Act 1996 and Rajasthan Building and Construction Workers Rules 2009	Employer shall- • Provide and maintain, at suitable point, sufficient quantity of wholesome drinking water, such point shall be at least 6 meters away from any washing areas, urinals or toilets • Provide sufficient urinals and latrines at convenient place, easily accessible by workers • Provide free of charge, temporary living accommodations near to work sites with separate cooking place, bathing and lavatory facilities and restore the site as preconditions after completing the construction works • Provide crèche with proper accommodation, ventilation, lighting, 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	Contractors are required to follow all the provisions of BOCW Act and Rajasthan BOCW Rules. Salient features of Rajasthan BOCW Rules are- Chapter III, section 17- Registration of establishments Chapter VIII, section 61- Hours of works, intervals or rest and spread over, overtime Section 62- weekly rest Section 63- night shift Section 67- registers of workers Section 68- Muster roll, wages register Section 70- latrine and urinal facilities Chapter XI- Safety and Health Section 78- fire protection Section 79- emergency action plan Section 80- fencing of motors Section 81- lifting and carrying of weight Section 82- H&S policy Section 83- dangerous and harmful environment Section 84- Overhead protection Section 88- eye protection Section 89- PPEs Section 90- electrical hazards Section 97- use of safety helmets and shoes Chapter XIII-lifting appliances and gears Chapter XV- transport and earth moving equipment Chapter XVI- concrete works Chapter XVII- demolition works Chapter XVIII-Excavation and tunnelling Chapter XX- ladders and step ladders Chapter XXII- structural frame and formworks Chapter XXIV- medical facilities and first aid box	Construction

Law	Description	Requirement	Relevance to Project Phase
	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/unstacking • Safeguarding the machinery with fly-wheel of moving parts • Safe handling and use of plants operated by compressed air • Fire safety • Limit of weight to be lifted by workers individually • Safety in electric wires, apparatus, tools and equipment • Provide safety net, safety sheet, safety belts while working at height (more than 1.6 mtrs as per OSHA) • Providing scaffolding, ladders and stairs, lifting 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	• Applicable to all construction works in the project • Principle employer (RUDSICO-EAP) to obtain Certificate of Registration from Department of I, as principle employer • Contractor to obtain license from designated labor officer	Construction and operation

Law	Description	Requirement	Relevance to Project Phase
	designated Officer. The Act is applicable to the establishments or Contractor of principal employer if they employ 20 or more contract labor. The inter-state migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home up to the establishment and back, etc.,	- Contractor shall register with Labor Department, if Inter-state migrant workmen are engaged - Adequate and appropriate amenities and facilities shall be provided to workers including housing, medical aid, traveling expenses from home and back, etc., Appendix 9 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
International conventions and treaties			

Law	Description	Requirement	Relevance to Project Phase
Ramsar Convention, 1971	The Ramsar Convention is an intergovernmental treaty that provides the framework for national action and international co-operation for the conservation and wise use of wetlands and their resources. India is one of the signatories to the treaty. The Ramsar convention made it mandatory for the signatory countries to include wetland conservation in their national land use plans.	Keoladeo National Park in Bharatpur is one of the first recognized Ramsar Site in India. Recognised on October 01, 1981. No project component is proposed with or near Keoladeo National Park and its eco sensitive zone in Bharatpur.	Not applicable
Convention concerning the Protection of the World Cultural and Natural Heritage	Convention concerning the Protection of the World Cultural and Natural Heritage (5), it was adopted by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) in 1972	Keoladeo National Park is one of the World Cultural and Natural Heritage recognized by UNESCO. No project component is proposed within or near Keoladeo National Park and its eco sensitive zone.	
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 Hydrochlorofluoro carbons (HCFCs)	Not applicable in this project as no ODS are involved in construction works	Not applicable
Basel Convention on Trans-boundary Movement of Hazardous Wastes, 1989	India is a signatory of this convention which aims to reduce trans-boundary movement and creation of hazardous wastes	Contractor to follow the provisions of Hazardous Waste Rules 2016 for storage, handling, transport and disposal of hazardous waste emerged during construction works Under this Convention, asbestos or asbestos waste in	Not applicable

Law	Description	Requirement	Relevance to Project Phase
		the form of dust and fibers is classified as hazardous waste.	
Convention on Migratory Species of Wild Animals (CMS), 1979 (Bonn convention)	CMS, also known as Bonn convention, was adopted in 1979 and entered into force on 1 November 1983, which recognizes that states must be the protectors of migratory species that live within or pass through their national jurisdictions, and aims to conserve terrestrial, marine and avian migratory species throughout their ranges. Migratory species threatened with extinction are listed on Appendix I of the Convention. CMS Parties strive towards strictly protecting these species, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them. Migratory species that need or would significantly benefit from international cooperation are listed in Appendix II, and CMS encourages the Range States to conclude global or regional agreements.	Not applicable to this project as no migratory species of wild animals are reported in the project areas.	Not applicable

66. **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 Nigam 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 under Water Act, 1974 from RSPCB	PIU & Contractor
5	Operation of new STP	Consent to operate under Water Act, 1974 from RSPCB	
6	Tree Cutting	State forest department/Revenue (Tehsildar)	PIU

S. No	Construction Activity	Statute under which Clearance is Required	Implementation
7	Hot mix plants, Crushers, Batching plants and DG Set	Consent to establish and consent to operate under Air Act, 1981 from RSPCB	Contractor
8	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
9	Sand mining, quarries and borrow areas	Permission from District Collector/ State Department of Mines & Geology	Contractor
10	New quarries and borrow areas	Environmental clearance under EIA Notification 2006	Contractor
11	Use of vehicles and equipment	Pollution under control certificate (PUC) form RTO	Contractor
12	Temporary traffic diversion measures	Temporary traffic diversion measure including use of alternate road from District traffic police	Contractor
13	Use of Railways ROW for construction area/ crossing	Indian Railways	PIU
14	Use of highway ROW for construction area/ crossing	National Highway Authority of India	PIU

67. 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

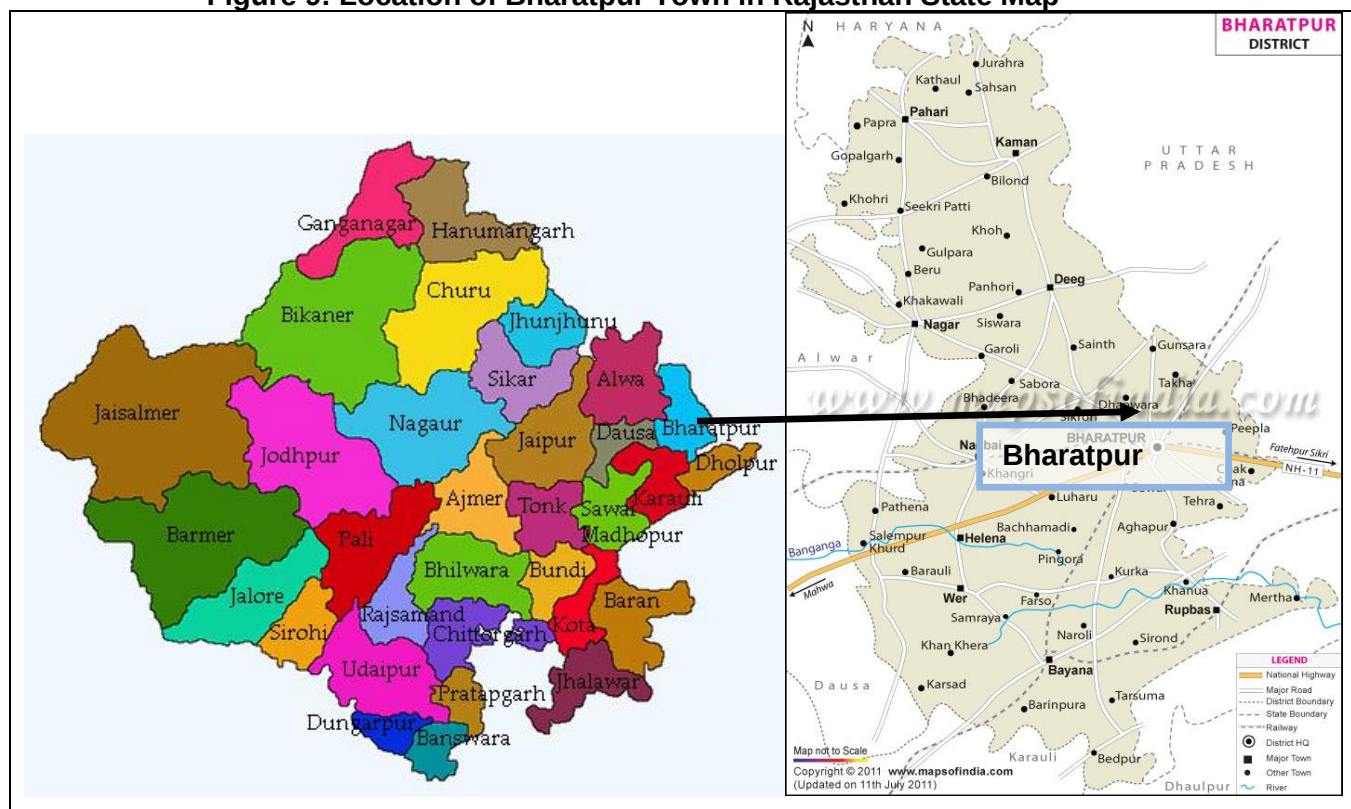
A. Physical Environment

1. Location, Area & Connectivity

68. Bharatpur, also known as 'Eastern Gate of Rajasthan', is located in the Braj region 180 km away from Delhi. Geographically, the district is situated between 26° 22' and 27° 83' N and 76° 53' and 78° 17' E and its average height above sea level is around 183 m. Bharatpur city is the district headquarters and is also known by the name of Lohagarh. It is situated very close to the main cities of Rajasthan and other states. Distance between Jaipur and Bharatpur is around 178 km whereas Agra lies at a distance of 55 km from the district. Mathura is located at a distance of 34 km. Bharatpur touches Gurgaon of Haryana in the north, Mathura in the east, Agra of Uttar Pradesh and Dholpur of Rajasthan in the south and Dausa and Alwar in the west.

69. Presently, Bharatpur is district headquarter and is also administrative head quarter commissioner, covering other three district under it namely Dholpur, Karauli and Sawai Madhopur. Municipal Services in the existing areas of the city are managed by local self-government body "Bharatpur Nagar Parishad". Development of upcoming areas of the city is looked after by UIT. Location of Bharatpur town in Rajasthan State map is shown in **Figure 9**.

Figure 9: Location of Bharatpur Town in Rajasthan State Map



70. The general physical character of district comprises of sand and rocky land in the major part. It is situated on an average altitude of 250 m above mean sea level.

2. Topography, Soils and Geology

71. **Topography:** the district is situated between $26^{\circ} 22'$ and $27^{\circ} 83'$ N and $76^{\circ} 53'$ and $78^{\circ} 17'$ E and its average height above sea level is around 183 m Topographically Bharatpur, is levelled and saucer in shape. The general Topography of the city is low lying & marshy with black cotton soil. Looking at topography the town is like a saucer in shape, except inner mort portion, which have highest ground level from another site. Topography is marked by undulation without any regular slope pattern. There are several depressions scattered all over the city which get filled with Rainwater/ Wastewater. Two annular shape water bodies called inner mode (Sujan Ganga) and outer mode are interesting part of city's landscape. Besides inner mode and outer mode there are four other channels, namely CFCD, Giriraj Channel, Goverdhan Canal and RFCD which are draining the rainwater from the city. A canal starting from Ajan Bandh dam come up to Ranjit Nagar & Sujan Ganga.

72. **Soils.** The soil is generally alluvial, prone to water logging. The nature of recently alluvial calcareous has been observed. Nutrient level in the Bharatpur soil including area coverage of saline and sodic soil. The nutrient status of the Bharatpur soil is graded as low to medium level.

73. **Drainage:** The peculiar topography of the town provides natural drainage pattern. The area has been divided into two river drainage basins, namely Barah river basin towards north and Banganga river basin towards south.

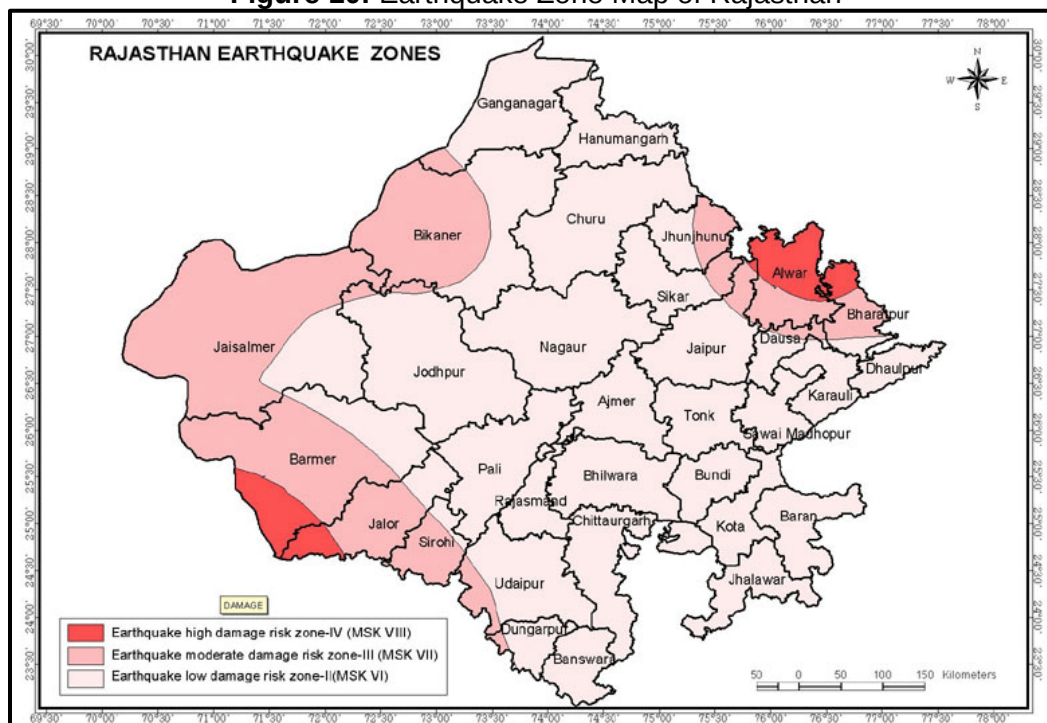
74. **Geology:** The rock types of districts exposed are grouped under Alwar and Ajabgarh Groups belonging to the Delhi super group (Lower to Middle Proterozoic). The rocks of Alwar group comprising quartzite, basic volcanic tuffaceous sandstone, shale etc. are well exposed in the south-western part of the district around Khankhera. The major parts of the district are occupied Quaternary alluvium and blown sand which conceal the hard rock geology. Hydrogeological domains of unconsolidated and consolidated rocks formation with varying ground water potential. Different formations belonging to Alwar super group, Delhi super group, Vindhyan group and Quaternary alluvium form the geological framework of the district. About 85% area of the district is occupied by alluvium and windblown sand.

75. **Geomorphology.** Geo-morphologically the district classified into seven geomorphic units namely hill and valley, younger flood plains, ravine, obstacle dunes and pediment / pediplain. On an average 90% of the district area covered with unconsolidated porous formations.

76. **Mineral Resources.** Barytes, buildings stones, and quartz are the important minerals of the district. The STP and SPS site has no mineral resources. Barytes closely associated with the basic intrusive occurs in the rocks of the Delhi Super group. Barytes veins occur as fissure filling in quartzite. Occurrences are reported from Hatori (27°00' :77°06'), Karwar (27°00' :77°03') etc. Small deposit of copper with an indicated reserve of 1 million tone with 1% Cu is located near Khankhera (26°55' :77°08'). Minor occurrence of lead is reported from Jotri (27°35' :76°58'). Quartz is available at many places in the district. Quartzite and sandstone are quarried at Bansi Paharpur (26°56 :77°03'), Dig (27°27' :77°19') etc. White spotted, reddish sandstone of the Bhander Group is in great demand as building Stone.

3. Seismology

77. According to the Vulnerability Atlas of India, Bharatpur Town falls in "Earthquake Moderate damage risk zone-III so all structures will be constructed as per resistant of earthquake high damage risk zone-IV. 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 Bharatpur. Earthquake Zone Map of Rajasthan is shown in **Figure 10**.

Figure 10: Earthquake Zone Map of Rajasthan

4. Climatic Conditions

78. The climate of Bharatpur Town is quite dry. The summer season is hot, but milder than most of the other Rajasthan cities. The maximum temperature during summer months (April to June) goes above 49°C quite frequently and has reached up to 43°C during peak summer. The temperature during winter months (December to February) normally touches 25°C and the lowest minimum temperature recorded is 9°C.

79. Average annual rainfall of the district is 582.9mm. Major portion of rainfall is received in the monsoon season. In the last year 2021 actual rainfall received is 596.3 mm while normal rainfall 545.2.

Table 12: Rainfall Statistics of Bharatpur District

Duration	Cumulative Rainfall Statistics of Bharatpur District				
	SR NO.	Name of district	Actual rainfall (mm)	Normal rainfall (mm)	Departure from normal (%)
01/06/2021 to 30/09/2021	1	Bharatpur	596.3	545.2	9
01/06/2020 to 30/09/2020	2	Bharatpur	468.9	545.2	-14
01/06/2015 to 30/09/2015	3	Bharatpur	393.1	557.6	-30

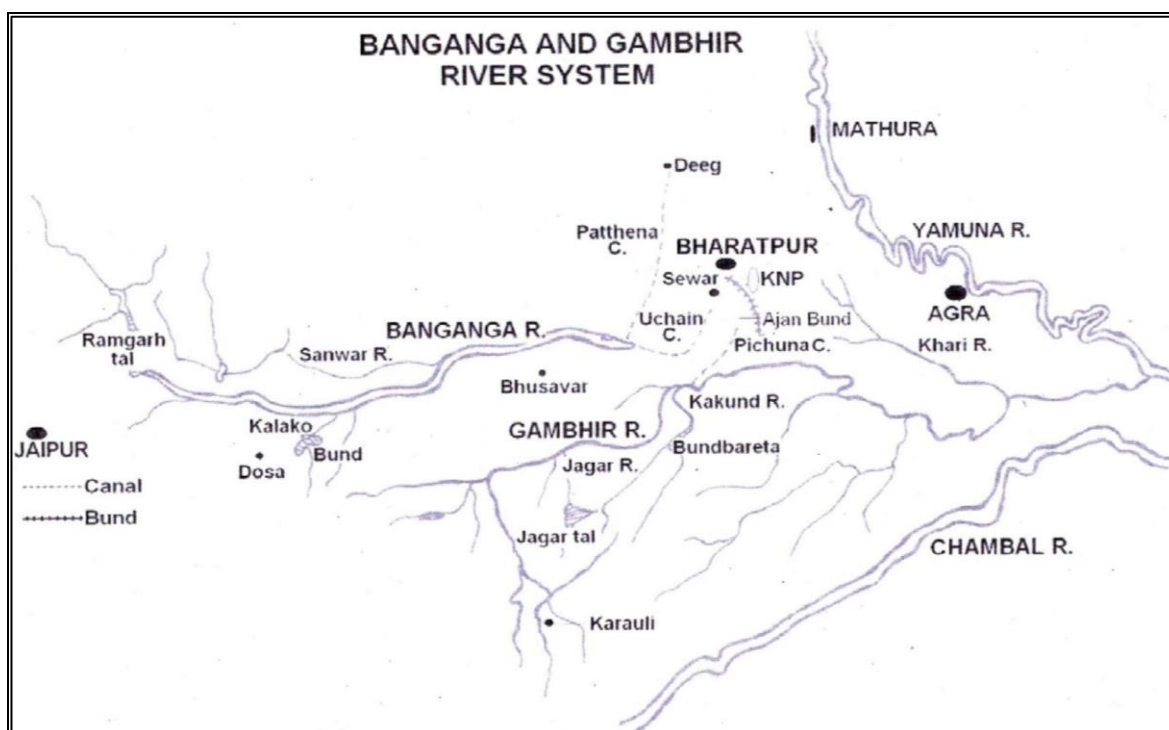
Source: IMD Jaipur (End of season report 2021, 2019 and 2015)

5. Surface Water

80. There are only three main seasonal rivers in this District, namely Ban Ganga, Rooparel and Gambhir. Ban Ganga starts from Ramgarh Dam of Jaipur district, passes from Bharatpur and meets in river Gambhir near tehsil Bayana of District Bharatpur. Gambhir river starts from

Panchna Dam of district Karauli and after passing from Bharatpur meets River Yamuna in Uttar Pradesh. Rooparel River starts from hills of district Alwar and enters into Bharatpur from tehsil Kaman. Instead of this, a Dam, namely, Bandh Baretha is situated near the village Baretha on river Kakund which starts from the hills of district Karauli. The water of this dam is used for drinking and irrigation purpose for this district. The capacity of this dam is 684.00 million cubic feet (29 Gaze feet). However, 9.4 MLD STP discharge is proposed on the Bharatpur flood control drain therefore some temporary slight changes may be taken in physicochemical properties of this drain water in the condition of untreated sewer discharge into drain.

81. **Bharatpur City flood Control Drain** is an earthen drain and is the main drainage line for Bharatpur town. Entire domestic wastewater not collected through Sewer lines and storm water runoff within the circular road and around Bharatpur town, discharged into this drain. It start from Kali Bagichi where storm water of south of Bharatpur. The alignment of this drain starts from Kali Bagichi and passes through Atal Bandh Gate, Neemda Gate, Anah Gate, Kumher Gate, Chandpole & upto Jaghina Gate. It consist of 25 nos. storm water inlets on left and 12 nos on right side.



6. Groundwater

82. For broadly grouping geological formations from ground water occurrence and movement considerations, the various lithological units have been classified into two groups on the basis of their degree of consolidation and related parameters. These are,

- (i) Unconsolidated porous, quaternary formation; and
- (ii) Fissured formations – consolidated sedimentary rocks.

83. On an average 90 % of the district area covered with unconsolidated porous formations. Ground water quality of Bharatpur is assessed by examine various physico-chemical parameters

of open wells, bore wells and hand pumps. The results reveal that the water of most of the sampling area is hard and contaminated with higher concentration of total dissolved solids.

84. Because of the sandy soils and lack of rainfall, the water table is very deep around Bharatpur Town, ranging from 38-46 m below ground level. The main aquifer lies below this depth, comprising Lathi formations from the Lower Jurassic Age, composed of mainly sandstones and some lime stones in the upper levels. The aquifer is tapped by a number of wells, but the yield is reported to be low. Bharatpur Municipal Board (BMB) has developed a well field at Dabla Village 12.5 km from the town, where the aquifer is around 85 m below the surface. There are 12 tube wells of 200 m depth providing an average yield of 18,000 l/h, producing a total of around 3 million litres per day.

85. The chemical quality in the district is fresh to brackish; and quality of ground water varies from place to place. Most of the area shows higher values of fluoride and nitrate in the drinking water samples some other samples have higher values of TDS, Alkalinity, Hardness and chloride while remaining parameters are within the permissible limits.

86. Ground water and surface water quality monitoring will be done during the pre-construction activities of this sub-project.

7. Air Quality

87. Ambient air quality in Rajasthan is monitored by Rajasthan State Pollution Control Board. In Bharatpur, ambient air quality is monitored at one location within the city (at Khadi Gamoday Samiti). As presented in the following table, annual average concentration of gases like NO₂ and SO₂ are within both national standards and WHO guideline values, while particulate matter concentration (PM₁₀) is high.

88. The contractor is required to conduct ambient air quality of Jodhpur in the pre-construction phase to establish the baseline at project sites and will continue periodic monitoring as per the environmental management plan.

Table 12A: Ambient air quality of Bharatpur (annual average)

Yes	PM ₁₀ (µg/m ³)	NO ₂ (µg/m ³)	SO ₂ (µg/m ³)
2022	179	34.8	15.91
2021	179	32.59	14.95
2020	182	35.74	14.24
2019	194	36.55	12.69
2018	207	35.83	10.39
2017	159	33.72	8.38
2016	159	32.66	8.68

2015	201	25.73	10.08
Standards			
NAAQS (annual)	60	40	50
WHO guidelines (annual)	20	40	20

NO₂ = Nitrogen Dioxide

NAAQS = National ambient air quality standards

PM₁₀ = Particulate Matter size less than 10µm or

SO₂ = Sulphur Dioxide

WHO = World Health Organization

Source: RSPCB

8. Noise Quality

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

B. Ecological Resources

1. Forest areas

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

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

92. As per the year 2021 assessment of the India State of Forest Report 2021 published by Ministry of Environment, Forests and Climate Change (MoEFCC), Bharatpur district has about 5066 sqkm area out of which 221.06 sqkm is total forest area, which is about 4.26 % of total Geographical area of district. Out of which, 26.33 sqkm area is covered with moderate dense forest and 194.73 sqkm is open forest The forest area in district has been decreased by -9.21 % from 2019 assessment. About 77.15 sqkm area of Bharatpur covered with scrub forest.

93. Flora in Bharatpur consists of different vegetation types. The principal vegetation types are tropical dry deciduous forest dominated by *Acacia nilotica* intermixed with dry grassland. Besides the artificially managed marshes, much of the area is covered by medium-sized trees and shrubs. The common species grown near settlements are mostly edible or useful plants such as *Acacia chundra*, *Acacia nilotica*, *Aegle marmelos*, *Azadirachta indica*, *Bauhinia racemosa*, *Butea monosperma*, *Diospyros melanoxylon*, *Diospyros melanoxylon*, *Dichrostachys cinerea*, *Madhuca indica*, *Zizyphusnummularia*, *Mangifera indica*, *Embllica officinalis* and *Mitragyna sp.*

94. **Fauna:** The district is known for its duck shoots. Geese, ducks, teals, pintails, Siberian cranes during winter. Local birds are mainly egrets, painted storks, ibises, cormorants, saras cranes, spoonbills, and open-billed storks, darter, besides common parakeets, crows babblers, partridges and weaver bird.

2. Forest and Protected area in Bharatpur.

95. Bharatpur town is famous for **Keoladeo National Park** (KNP) formerly known as the Bharatpur Bird Sanctuary which was created 250 years ago. Situated at South of Bharatpur, Keoladeo is named after (Shiva) temple within its boundaries of National Park. Initially, it was a natural depression; and was flooded after the Ajan Bund was constructed by Maharaja Suraj Mal, the then ruler of the princely state of Bharatpur, between 1726 to 1763. The bund was created at the confluence of two rivers, the Gambhir and Banganga. Keoladeo was declared as a Ramsar site under the Convention on Wetlands of International Importance in year 1981. In 1985 The park was declared as World Heritage Site by UNESCO under the World Heritage Site Convention. The Subproject is proposed at northern side of Bharatpur town and the KNP is situated at Southern side of town. The nearest component to KNP is SPS1 proposed about 2736 m from outermost boundary of eco-sensitive zone and about 2200 m from national park's boundary.

96. National Park is a famous avifauna sanctuary of thousands of rare and highly endangered birds such as the Siberian Crane come here during the winter season. Over 230 species of birds are known to have made the National Park their home. It is also a major tourist centre with scores of ornithologists arriving here in the hibernal season. It was declared a protected sanctuary in 1971. The Keoladeo National Park is spread over 28.73 square kilometres recently eco-sensitive zone of sanctuary was defined by MoEFCC (261. S.O. 814(E) [21.02.2020]). The ESZ Zone for this national park will be 500 meters around the notified limit.

3. Flora

97. The KNP falls in the Punjab plains biotic province of semi-arid biogeographical zone, which is a flat dry area of the Indus-Yamuna watershed. The area also falls under Aravalli region. The Park's vegetation is a blend of xerophytes and semi-xerophytes consisting predominantly of *Acacia nilotica*, *Capparis decidua*, *C. sepiaria*, *Mitragyna parviflora*, *Prosopis cineraria*, *Salvadora oleoides*, *Syzygium cumini* and *Zizyphus* sp. The KNP has immense floral diversity from aquatic to terrestrial species in spite of its location in the sub-tropical region. The major trees found in the Park are *Acacia nilotica*, *Acacia leucophloea*, *Capparis* sp., *Mitragyna parviflora*, *Prosopis juliflora*, *Syzygium cumini*. *Salvadora* sp. and *Capparis* sp. show stunted growth depending much on the soil type in the park. Herbs constitute more than 55% of the floristic species. The most widespread grasses in the park are *Cyanodon dactylon*, *Desmostachya bipinnata* and *Vetiveria zizanioides* (khus grass).

98. As of now and also reported in the earlier studies the vegetation of the KNP wetland is largely dominated by emergent macrophytes, mainly *P. spinescens*, together with *P. distichum*, *P. punctatum*, *Limnophyton obtusifolium*, *C. alopecuroides*, *Panicum paludosum*, *Scirpus tuberosus*, *Scirpus littoralis* and *Echinochloa colonum*. Of 90 aquatic macrophytes (Prasad 1988), *Pseudoraphis spinescens* and *Paspalum distichum* predominate the wetland system. The weed species namely *Ipomoea aquatica* and *Eichhornia crassipes* (Water hyacinth) come up periodically and are removed manually on a regular basis with the help of local villagers as a part of KNP management plan. The edges of the wetland which remain inundated for almost 4-6 months remain covered by dense growth of sedge species such as *Scirpus tuberosus* and *Cyperus rotundus*. The tubers of these sedges and the rhizomes of water lilies (*Nymphaea* sp.)

are the favourite food of the endangered species, the Siberian crane. Among the submerged plants, *Hydrilla verticillata*, *Najas minor*, *Vallisneria natans*, *Ceratophyllum* sp. and *Potamogeton* sp. are consumed by waterfowl.

4. Wetland Vegetation

99. The major plant species dominating the wetland vegetation are *Cyperus alopecuroides*, *Hydrilla verticillata*, *Ipomoea aquatica*, *Neptunia oleracea*, *Paspalidium punctatum*, *Paspalum distichum* and *Pseudoraphis spinescens*. Being mostly seasonal and dynamic the wetland system of the Keoladeo National Park supports six major / dominant types of vegetation communities, namely (i) free floating (*Spirodella polyrhiza*, *Lemna perpusilla*, *Eichornia crassipes*), (ii) rooted with floating leaves (*Nymphaea pubescens*, *N. nouchali*, *Nymphoides cristatum*), (iii) free submerged (*Ceratophyllum demersum*, *Utricularia aurea*, *U. stellaris*), (iv) rooted submerged (*Hydrilla verticillata*, *Najas minor*, *Potamogeton crispus*), (v) emergent, amphibious (*Eleocharis dulcis*, *Paspalum distichum*, *Cyperus alopecuroides*, *Scirpus littoralis*, *Ipomoea aquatica*) and, (vi) marshland plants (*Caesulia axillaris*, *Eclipta prostrata*, *Echinochloa colonum*)

5. Fauna

100. KNP is rich in faunal wealth. 375 species of birds, 34 species of mammals, 29 species of reptiles, 8 species of amphibians, 57 species of fishes and 71 species of butterflies, more than 16 species of dragonflies and more than 8 species of spiders inhabit the park.

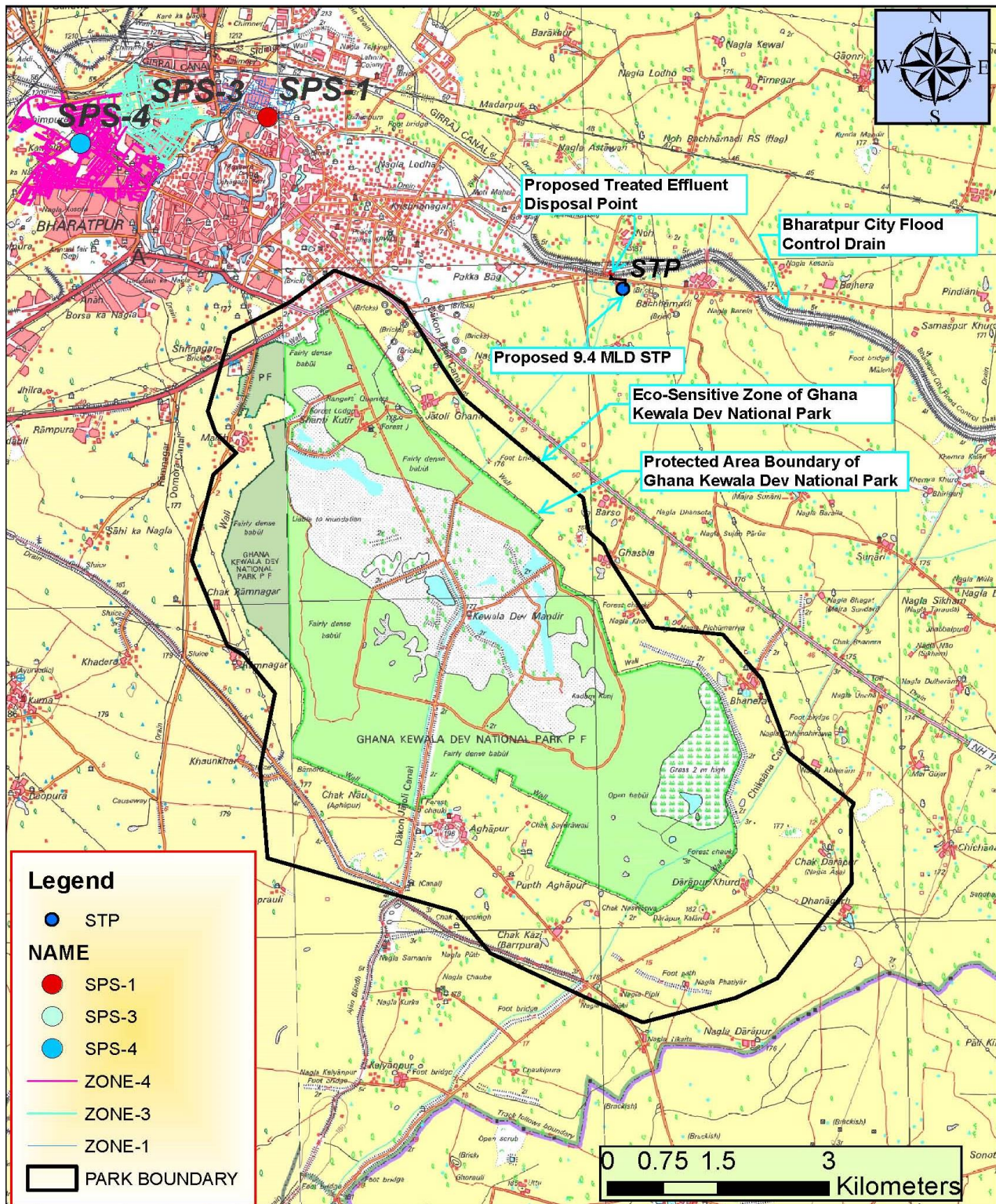
101. **Mammals:** Mammalian Fauna at Bharatpur comprises of 27 identified species including Indian porcupine, Sambar, Chital, Fishing Cat, Asian Palm Civet, Golden Jackals, Striped Hyenas and others.

102. **Birds-** More than 330 species of birds have already been identified. Local birds such as Painted Storks, Open Bill Storks, Spoonbills, Cormorants, Darters, Ibises, Moorhen, Pheasant - tailed Jacana, Purple Coot, White-breasted Waterhen, Paddy Bird, Night Heron, Comb Duck (Nukta) and Dabchick, begin nestling when the rains are about to start. Migratory birds start arriving in October which include a variety of Ducks, Geese, Raptors, Waders, Warblers and Cranes (including the Siberian Crane, of which there are about only 350 birds in the world and the Sanctuary is the wintering ground for about 52 such Cranes).

103. **Fishes** - The fish fauna of the park comprises 57 species, of which 37 enter the park along with the water from rivers, and six species are breeding residents. *Channa punctatus*, *Channa striatus*, *Channa marulius*, *Heterpneustes fossilis*, *Clarius batrachus* and *Colisa fasciata* breed inside the park.

104. **Amphibians and Reptiles** - Keoladeo National Park has seven species of turtles while the whole of Rajasthan state has only eleven species. Besides this, there are 5 species of lizards, 3 geckos, 14 snake species and 8 species of amphibians.

Figure 11: Proposed Component Locations on Topo Sheet, Showing Eco-sensitive zone of Keoladev national park



105. Biodiversity Assessment Report (IBAT Analysis) for Sewerage system of Bharatpur has been attached with this report as **Appendix 22**. 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). There are 28 species of concern fauna listed as IUCN Red list, are 12 nos critical endangered and 16 endangered. Proposed activities are within the urban area of Bharatpur where there is no presence of such species. These mostly occur in the nearby protected areas.

C. Economic Development

106. Economic base of a town reflects its prosperity. Bharatpur town, being the districts headquarter, has been functioning as administrative centre. Bharatpur is known not only for agriculture production but also for oil industries. It has also sustained growth in tertiary economic activities. The major economic activities are trade and commerce; thus, it offers a number of wholesale and retail markets which act as a distribution centre for nearby towns and villages. Tourism income contributes very much towards economic generation of the town on the contrary household industries play a big role in providing employment and income generation.

1. Land use

107. The socio-cultural and economic factors have significantly influenced over land use both in rural and urban areas. Land forms, slope, soils and natural resources are some of the important which control the land use pattern of the town. Data are based on bharatpur statistics outline, 2012-13. The land use pattern of district is presented in **Table 13** below-

Table 13: Existing Land Use of Bharatpur

S. No.	Land Use	year 2001 area(acre)	year 2001 Proposed area (%)	Proposed total area - 2023	Proposed total Developed area (%) - 2023	Proposed total urbanised area (%) - 2023
1	2	3	4	5	6	7
1	Residential	1864	48-77	5414	46-24	42-46
2	Commercial	206	5-40	618	5-28	4-84
3	Industrial	344	9-00	585	4-99	4-58
4	Government, Semi-Government	41	1-07	191	1-63	1-49
5	Public and Semi Public	576	15-07	1215	10-38	9-52
6	Recreation	166	4-34	1251	1251	1251
7	Circulation	625	16-35	2298	19-63	18-02
8	Special Planning area			136	1-16	1-06
	Total Developed area	3822	100-00			
	Total area for development			11708	100-00	91-78
9	Afforestation	802		435		3-42
10	Vacant land			195		1-54
11	Government reserved	215		215		1-69
12	Water bodies	254		198		1-57

S. No.	Land Use	year 2001 area(acre)	year 2001 Proposed area (%)	Proposed total area - 2023	Proposed total Developed area (%) - 2023	Proposed total urbanised area (%) - 2023
13	Urbanised Area	5093				

2. Commerce, Industry & Agriculture

108. **Trade and Commerce.** Bharatpur has been divided into six industrial areas:-

- (i) Old Industrial Area Bharatpur- A total 175.66 acre land has been allotted to this industrial area, out of which on 144.66 acre land 198 plots have been developed and 188 plots have been distributed to the entrepreneurs.
- (ii) The main retail and wholesale business activities of the town are carried out with the newly developed main market street where retail and transport-oriented businesses are located.
- (iii) Brij Industrial Area Bharatpur- A total 233.06 acre land has been allotted to this industrial area, out of which on 213.06 akad land 267 plots have been developed and 206 plots have been distributed to the entrepreneurs.
- (iv) Industrial Area Bayana- 53.22 acre land has been allotted to this industrial area, out of which on 52.20 acre land 127 plots have been developed and all plots have been distributed to the entrepreneurs.
- (v) Industrial Area Deeg- 39.08 acre land has been allotted to this industrial area, out of which on 30.85 acre land 92 plots have been developed and 91 plots have been distributed to the entrepreneurs.
- (vi) Industrial Area Jurhera- 40 acre land has been allotted to this industrial area, out of which on 40 acre land 64 plots have been developed and 58 plots have been distributed to the entrepreneurs.
- (vii) I.I.D. Center Bayana- 66.72 acre land has been allotted to this industrial area, out of which on 52.20 acre land 164 plots have been developed and all plots have been distributed to the entrepreneurs.

3. Industries

109. The industrial areas in Bharatpur town are Brij industrial area, Byana industrial area and Deeg industrial area.

110. Bharatpur town all the important infrastructures facilities for economic and industrial growth like water, power, transport, communication, industrial training, industrial estates, etc. One of the additional advantages is that Bharatpur is located at a very central place, linking it with important trade and industrial centers of the country. The impact of economic facilities has resulted in setting up of a number of large and medium scale industries and has contributed to the development of small-scale industries throughout the district. There are five large/medium scale industries in the district, viz., M/s. (CIMMCO) Central India Machinery Manufacturing Co. Ltd. Bharatpur, M/s (GEW) General Engineering Works, Bharatpur, M/s DALMIA Industries Ltd. Bharatpur, M/s PERFECT SANITARY PIPE Manufacturing Co. Ltd. M/s CATTLE FEED PLANT Ltd. Nadbai, Bharatpur.

111. **Agriculture.** Bharatpur town is known not only for agriculture production but for oil

industries also mustard seeds and other agriculture products come to the market through mandies (wholesale market) established by Krishi Upaj Mandi Samiti (wholesale market committee) These Krishi Upaj Mandies are in Bharatpur, Nadbai, Weir, Deeg, Kaman, Bayana, Roopwas, and Bhusawar. About 70-80% of lands used for agricultural purpose.

112. Existing cottage and artisan units in the district are mainly based on handloom, forest, leather, and livestock, Industry. The development of cottage, village and artisan units is kept on important place in the development plans of the State. For the purpose easy loans on concessional Rate of Intt. by the financial instituted and the subsidies are also being provided for these units by state govt. Besides the above, the cottage/village/household and artisan units are also being facilitated by way of availability the loan facilities on liberal terms of various schemes of the NABARD and SIDBI through the channels of Regional Rural Banks, Commercial Banks, Co-operative Banks primary Land Development Banks etc.

113. Bharatpur is known not only for agriculture production but also known for oil industries. Mustard seeds and other agriculture products come to the market through mandies established by Krishi Upaj Mandi Samiti. These Krishi Upaj Mandies are in Bharatpur, Nadbai, Weir, Deeg, Kaman, Bayana, Roopwas and Bhusawar. There are total 554 oil mills registered in which 2317 persons are employed and Rs. 2690.84 lacs were invested. Out of these mills 78 are big units having AGMARK and rest are small oil expeller units.

4. Other Infrastructure

114. The total combined available water from the ground water and surface water is 24.03 MLD out of which 22.0 MLD is used for residential purpose and 2.03 MLD is used for other purposes. Current supply per capita is 60 liters per capita per day (lpcd) as against the standards of 135 LPCD. The existing water supply system comprises mainly of asbestos cement pipes.

115. **Sewerage and Sanitation.** At present, most of the Bharatpur town is covered with sewage networks and house service connections are being done for most of the house. Two projects has already been executed in town one under RUIDP, Phase-II (Funded by ADB) and other under AMRUT.

116. **Drainage.** Presently there exists a minimal network of storm water drains. These drains are also receiving the sludge and waste through domestic sewer. The existing drainage system is a piece-meal construction without proper designs of open nallahs (drains) that are irregular and insufficient. The wastewater along with sewage is discharged into the fields towards west of the town through open drains.

117. **Industrial Effluents.** Industries are outside the town area. The industries are required to treat their own effluents before disposal and are not allowed by the Bharatpur Nagar Parishad to connect to the local sewer network.

118. **Solid Waste.** The total waste generation in the town is about 116.74 MTD. the waste is collected door to door and processed in designated landfill and waste processing area of Bharatpur Nagar Nigam funded by ADB in RUIDP Phase - II. Biomedical wastes are collected and transported to Alwar for incineration.

119. **Storm Water Drainage:** Bharatpur 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 problem gets aggravated due to low water percolation as account of presence of higher percentage of silica clay formation in the sub soil which renders it less permeable and prone to moisture retention. The surface runoff from the town finally gets accumulated in every monsoon season in the outskirts of town in low lying areas.

5. Transport

120. Transport in the city is mainly by personal vehicles (motorcycles and bicycles) and auto-and private taxis. The Rajasthan State Road Transport Corporation (RSRTC) runs public buses to neighbouring villages and towns and to larger towns farther afield, such as Jaipur, Alwar, Dhaulpur, Dausa , with which there are good road connections. Bharatpur is also connected to Agra, Jaipur and Delhi by the national railway. National Highway no. 21 passes through the town to which State Highway no. 01,14,22,43,44,44A crosses in town. Roads are broad (about 60 feet) in city area which crosses at rectangle to each other. Broad gauge railway line and railway station exist in Bharatpur which connects Bharatpur with all the major districts of Rajasthan and other part of country.

D. Socio Cultural Resources

1. Demography

121. Bharatpur as of 2011 India census, had a population of 252342. The major languages spoken are Dehati and Hindi. The town has been growing steadily since 1951. The growth of the town has been phenomenal during 1961-71 when there was an influx of population of immigrants to this town. However, thereafter also the growth was not stable. The average decadal increase is 37.78%. However, the last decadal (2001-2011) growth is only 22.95%.

2. History, Culture and Tourism

122. Bharatpur the Eastern Gateway to Rajasthan was founded by Maharaja Suraj Mal. It was once an impregnable well-fortified city, carved out of the region formerly known as Mewat. The trio of Bharatpur, Deeg and Dholpur has played an important part in the history of Rajasthan.

123. The place was ruled by an tribal community of Sinsinwar clan, who came to India in 100 AD. Gohad city was built in 1505 AD and developed as a famous Jat state which was later ruled by the Marathas. In 1733 AD, Maharaja Suraj Mal built the city of Bharatpur. It is believed that it was a well-fortified city under his rule. Bharatpur was carved out from Mewat and got its name from Lord Bharat (Lord Rama's brother).

124. From the point of tourism, the Bharatpur town has a number of religious, historical and archaeological places of importance. These places mainly attract the tourists from within the country as well as abroad. The historical places include Lohagarh fort or the Iron Fort “and other places like Keoladeo National Park, Kamra Khas Palace, Deeg fort, and Purana Mahal which attracts domestic and foreign tourists. A famous breeding water bird sanctuary called 'Keoladeo Ghana bird sanctuary near Bharatpur.

125. **ASI Protected Monuments in Bharatpur** – Bharatpur town has 5 following ASI protected monuments.

- (i) Fateh Burj near Anah Gate;
- (ii) Moat surrounding the fort wall comprising part of Khasra No. 1881;

- (iii) Fort walls including Chowburja gate and approach bridges at the Chowburja and Ashtadhatu gates together with adjacent land comprised in part of survey plot No. 1881;
- (iv) Jawahar Burj and Ashtadhatu Gateway; and
- (v) Delhi Gate (Outside fort).

126. **Fateh burj**, built of earthwork is of strategic importance for the Jat rulers of Bharatpur due to location of the famous cannon over it, which perhaps played an important role in the victory of the rulers. The cannon is 6 m long with frontal diameter of 0.68 m. The perimeter on rear side is 2.67 m. The diameter of the slot is 16.5 cm. The cannon is placed over two stone shafts in east-north-east west-southwest alignment. The cannon bears engravings of rows of continuous arches, floral designs, a Swastik design and figure probably of a dog in dotted lines. The cannon is possibly made of wrought iron. The date is assignable to eighteenth century A.D.

127. **The fort wall** is massively built of stone rubbles in lime mortar with occasional use of *lakhauri* bricks at top and is surrounded all around by a deep and wide moat filled with water. The fort has only two gateways i.e. Chowburja Gate on the south flanked by round bastions on either side and Ashtadhatu Gate on the north. Both the gateways are approachable through long bridges. The bridge in front of Chowburja Gate is approximately 50 m long and 12 m wide. The other bridge is comparatively longer. It is datable to the eighteenth-century A.D.

128. **Moth Wall** - The city of Bharatpur and its fort are said to have been founded about 300 years ago by Rustam, a Jat of the Sogariya clan. Maharaja Surajmal took it from Khemkaran, the son of Rustam in A.D. 1733 and refurbished it by constructing a big fort and moat surrounding it. This historical fort, also known as Lohagarh, is rectangular in shape and has eight bastions with a high wall surrounded by a deep tapering moat (18.3 m wide). The outer wall got damaged at places but has now been repaired on the Gopalgarh side. Roads leading to the fort through its two gates i.e. Chawburja Gate and Ashtadhatu Gate, cross the moat by masonry bridges. The moat always remains filled with water

129. **Delhi Gate** - A small gateway in comparison to others facing north-northeast has an arched passage flanked by thick walls (1.5 m x 6 m) on either side. The gateway is built of stone rubble in lime mortar with lime plaster over it. The date is assignable to eighteenth century A.D.

130. The **Jawahar Burj** was constructed by Maharaja Suraj Mal (A.D. 1756-63) but the structures over it were raised by Maharaja Jawahar Singh (A.D. 1764-68) in commemoration of his victory of Delhi. Three mandapas were erected here, one painted with epic scenes. An inscribed Iron pillar bearing genealogy was recently erected here by the ex-ruler Maharaja Brijendra Singh. An Ashtadhatu Gate was brought from Delhi by Maharaja Jawahar Singh in A.D. 1765 as a trophy.

131. **Jawahar Burj** and stand erect within the glorious ramparts of the Lohagarh Fort. This site was considered as a coronation site for all the Jatrulers. This place is considered as victory towers and are decorated with deteriorating frescoes. It is different from the other forts in the state in that there is no flamboyance associated with the fort. However, it generates an aura of strength and magnificence.

132. No subproject components is places near ASI or state protected monuments. The nearest ASI monument is Mothwall surrounding the fort is about 450 m from proposed sewerage network in zone 1, rest all protected monument are situated between 500 to 5000 m distance from

proposed subproject components. Distance details are given in **Table 14** and map showing ASI and state protected monuments on Google earth in presented **Figure 12**.

Table 14: Distance of Proposed Subproject Components from ASI Monuments

Protected Monuments	Distance From Subproject Components (m)				
	SPS1	SPS3	SPS4	STP	Nearest Networks
Delhi gate (ASI Protected)	820	920	1790	5750	500
Fortwall (ASI Protected)	920	1020	1890	5850	540
Jawaharburj (ASI Protected)	690	1120	2000	5241	520
Moatwall (ASI Protected)	572	862	1612	4900	450
Fateh Burj (ASI Protected)	630	1954	2930	4750	520
Entire area of Kishori Mahal/Lohargarh Fort (State protected)	900	1230	2046	5500	930

133. State Protected monuments in Bharatpur.

- (i) Kishori mahal's complete premises, kamara khas kachahari kala, kothi khas, Hansarani palace, chaman Bagichi, Hamam and adjoining structure area and open land till boundary of the fort including three wells and gates of mudwall;
- (ii) Mathura gate;
- (iii) B. Narain gate;
- (iv) Atalbandh gate;
- (v) Anah gate;
- (vi) Kumher gate;
- (vii) Goverdhan gate;
- (viii) Neemda gate;
- (ix) Chandpol gate;
- (x) Surajpol gate; and
- (xi) The mud bastion with canon and platform situated near Surajpol gate on North side of mud wall and the surrounding area of 100 Sq. feet of the plate form.

134. Kishori Mahal - This place is built by by Maharaja Surajmal during the early half of 18th century A.D. for his family residence. Since Maharani Kishori, beloved wife of Maharaja Surajmal use to live in it. Hence his highness Sawai Brijendra singh named it as Kishori Mahal and it is known such till now. The palace carries the characteristics of mediaeval architecture. Cenotaph situated on the roof are an attraction of the palace. Creepers motif are inscribed on both entrance doors.

135. There are mainly two squares in the palace. The construction of the upper front part of this palace with the features of medieval architecture is incomplete. Chhatris are built on both sides above the east facing palace. There are several classrooms in the second square of the palace. This part of the palace is three storeyed. The palace has beautiful jaalis, windows with large rectangular design, etc. There are sights. There was a stable at the back of the palace. Belbute and lettering are engraved on both the four entrances of the palace.

136. The lattice structures built in the second square of the palace had fountains. Small doorways are built in the walls of the South Daul of the ground floor. In these lamps were kept and there was a provision of water flow from their upper part. A well was also built for water supply in the outer south-west part of the palace went.

137. Maharaja Surajmal Memorial and Panorama have been established here in 2008. The statue of Maharaja Surajmal and its local history have been carved on the stone in the east direction in front of the palace. Many galleries containing photographs, sculptures and manuscripts have been constructed inside the palace.

138. **Other Important monuments of Bharatpur.** The Lohagarh fort is the most distinguishable monument of Bharatpur district. It is also referred to as the iron fort and was founded and designed by Suraj Mai, the ruler of Bharatpur, in 18th century A.D. It took nearly twenty years for the fort to be completed. The name suggests the invincible nature of the fort. It stood firmly in face of repeated attacks by the British. More than splendour or lavishness, it is the air of magnificence and might that is associated with it. The Lohagarh fort of Bharatpur district is one of the best architectural monuments in Rajasthan. There are two gates in the fort, the one facing the north is called the Ashtdhaatu that is eight metal gate. It is decorated with paintings of elephants. The gate in the south is known as Chowburja or the four pillared gate. There are also some enthralling towers and monuments inside the Lohagarh fort. The tower Jawahar Burj was erected to celebrate the triumph of the Jats over the Mughals and the Fateh burj tower marked the defeat of the British army in the year 1803 A.D. The monuments like the Kishori Mahal, Mahal khas, Kothi khas and Moti Mahal inside the Lohagarh fort adds to its grandeur.

139. The Lohagarh fort in Bharatpur district at present has been transformed into an extensive museum. Articles like swords, daggers and guns and antiques like hunted tigers, bear kids, wood articles, vessels, jewellery boxes and ornaments have been put into display for tourists. There are also some inscriptions and historical pieces that are exhibited. The Lohagarh fort is breathing evidence to the gallantry and courage of the Jat rulers of Bharatpur

140. Another monument of Bharatpur is its palace. The Bharatpur Palace is next to Lohagarh fort in terms of magnificence and elegance. It is a medieval monument in the old city of Bharatpur in Rajasthan. It was built at different phases by different Jat maharajas of Bharatpur. The royal palace is a radiant combination of Rajput and Mughal architecture. The splendid apartments have beautiful carvings and are embedded with marvelously designed floor tiles. It gives us a vivid idea of the royal lifestyle of the Jat rulers

141. Bharatpur palace houses a museum which has a collection of antique that dates back to 2nd century. These specimens provide important historical evidence of the ancient culture of the region. The palace is located near to the museum and is within easy reach of the tourists. The designer floor tiles and the stylish furnishings are all reflective of the grace and splendour of the majestic lifestyle of the Jats

142. **Shri Banke Bihari Temple** - Built during the Mughal rule in Bharatpur, the Bankey Bihari temple in Bharatpur is a delightful temple inside the Lohagarh Fort.

143. The peace and silence that hang around the temple, as well as the soothing gongs that reverberate the still air inside the temple, make for an auspicious and serene atmosphere. The temple is dedicated to Lord Krishna and houses several idols celebrating his power and virtue. This temple is one of the best places to visit in Bharatpur.

144. **Government museum,** Bharatpur was established on 11th November 1944. There is massive collection of antiquities of historic and artistic importance.

145. In archaeological section of museum there are several sculptures and artful slabs of stone related to Jainism, Shaivism, Vaishnavism, Shakrism and other sets. These sculptures show the

religion development and sculpture art in this region.

146. On the upper storey of museum's gallery miniature paintings of various s locals and Mughal styles of Rajasthan are displayed. Manuscripts various types of artifacts of local handicrafts and stuffed animals wild animals also displayed. In arms section of the museum many kinds of arms and armory are displayed beautifully which were used by Jat warriors and some were acquired from Britishers. These arms shows the contemporary technique of war. Artistic work on the guns and swords is very attractive.

147. Besides the exhibited material in the galleries, the baradari of lofty six pillars on the roof and bath of Indo-Irani also known as "Persian Bath" of Mughal period (Hamam) are other main attractions of the museum.

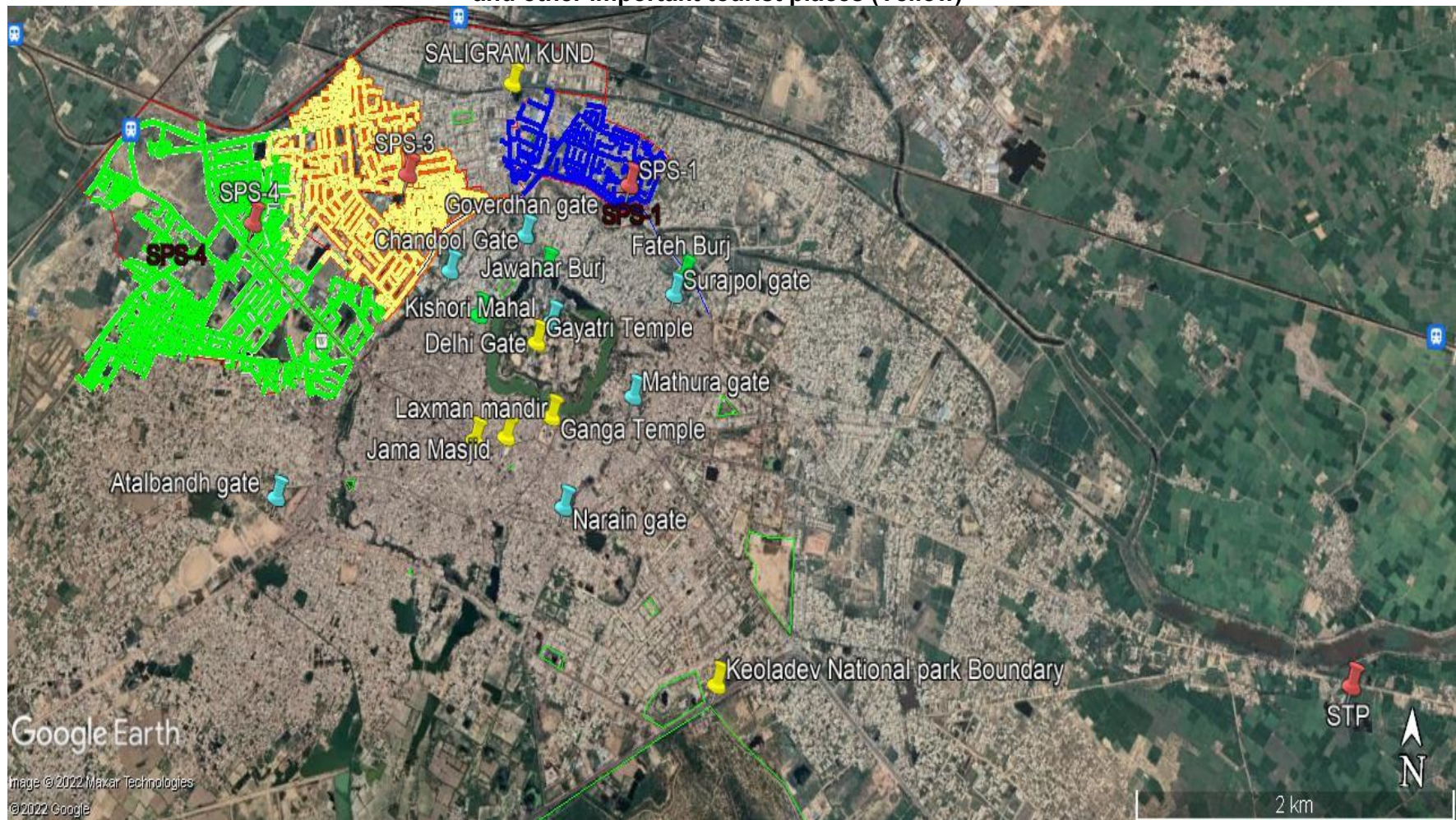
148. **Gayatri Temple** is located inside Lohagarh fort. This temple is built under the directions of Pandit Shri Ram Sharma Acarya Ji. Here Gayatri Pillar is also located. In this temple hand written 1.25 crores Gayatri books are present. This is the centre of "The GayatriParivar" on divisional level under which Dholpur, Karoli, Alwar and Bharatpur is included. The fire continuously burning from last 750 years is used to start daily "YAGYA" to start the Day.

149. **Brijendra Bihari temple** was founded in 1918 by Maharaja Kishan Ji to commemorate the birth of his son "Maharaj Brijendra Singh Ji." Maharaja Brijendra Singh Ji later donated this temple to Mahant Shri Vallabh Acharya Ji. Brijendra Bihari Kund was built in 1918 to meet the Temple's water needs, and it included 6 ghats and 1 well. Later, this Kund was used to provide drinking water for the elephants in the Seward fort.

150. **Saligram Temple** -. The Maharaj of Bharatpur built the temple 200-250 years ago to commemorate the birth of his son. Lord Hanuman Ji's idol can be found in the temple. This idol was discovered during excavation work for the Kund, making it more sacred and religious to the locals. The temple's first head priest was Mahant Shri Saligram Maharaj Ji, whose name the Kund and temple were named after.

151. There is an old saying about the place that when there was a lack of Ghee while making devotional offerings, the water of this Kund was used as Ghee in preparation of the same, making this Kund more of a place of belief.

Figure 12: Showing Project components along with, ASI protected monument (green), State protected monuments (Blue) and other important tourist places (Yellow)



E. Environmental Settings of Investment Program Component Sites

152. Sewers 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. There is sufficient space available for laying of Sewers pipes. 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.

153. STP (9.4 MLD) is proposed near Nagla Gopal, Near Ikran Village on vacant government land under Municipal Corporation. There are no trees present at site, which may be required to cut for construction of STP. There are only agricultural activities in the periphery of this site. There are no habitations within 250 m of the proposed site, however a cattle shed is observed at 75 m in north-east direction. No wildlife is reported in this area.

154. There are 3 nos. SPS are proposed at different location which are:- i) SPS-01 (0.81 MLD) Near Nai Mandi Circular road Tiraha in Zone-01, (ii) SPS-03 (1.64 MLD) Near Mukherjee Nagar Pulia, PNT Quarters in Zone-3, and (ii) SPS-04 (2.23 MLD) Deeg Road, Workshop Yojna Infront of Vaishali agency in Zone-04. Most of the Land is low lying and accumulated area where wastewater from nearby areas is accumulated. No wildlife exists near the proposed sites. Some shrubs are present at nearby locations of proposed components, but they may be not impact and if they will be possibility of cutting of trees for construction works than prior permission from local administration for tree cutting will be required and compensatory plantation as per RUDSICO-EAP policy will also be required. All the precautions should be taken during construction and operation to minimize the impacts on nearby residents. Proposed SPS-1 location is existed on Mathura- Bharatpur Highway and there are some motor service station and shops are existed at 35 m distance in north-west side. The nearest habitant is observed at approx. 43 meter aerial distance in north side. As similar to SPS-1 site SPS-4 site is also existed in commercial area where are some motor service stations are existed at 40-meter distance. Both SPS site are propped on govt. land and located near the commercial areas. There are no residential property within 50 meter periphery. At above mentioned both SPS site, sewer will be collected by gravity and there are no suitable locations therefore these sites are selected whereas some commercial properties are existed in surrounding location at 25-50 m radius. Proposed SPS-3 site is located near Mukherjee Nagar Pulia where a small Sankat Mochan Hanuman Temple is situated at 50 meter distance in south-east direction. Although this temple is sensitive receptor but there are no resident inside the Temple. This SPS site is also, under Nagar Parishad Bharatpur ownership and sewer will be collected by gravity in this SPS.

155. Site environmental features of all subproject sites and photographs are presented in the following Table 15.

Table 15: Environmental Features of Project sites

Table 10: Environmental Features of Project Sites							
S. No	Proposed Structure	Env. Sensitivity	Photo				
1.	STP (9.4 MLD)	- This Site is situated at campus of existing STP near village Ikran. 9.4 MLD STP is proposed on government land under ownership of Nagar Nigam. - The proposed site is connected with the Agra-Bharatpur state highway. - The nearest human habitation is at 250 m and a cattle shed at 75 m on northern side. - The site is surrounded by the agricultural fields. - The STP site is approximately 3.5 km away in the North from Keoladeo national park - The available and required government land at the location is 7300 m² and is 7000 m² respectively.	 Proposes site of STP near Ikran Village <table><tr><td>Lat.</td><td>27°12'18.7"N</td></tr><tr><td>Long</td><td>77°32'52.0"E</td></tr></table>	Lat.	27°12'18.7"N	Long	77°32'52.0"E
Lat.	27°12'18.7"N						
Long	77°32'52.0"E						
2.	SPS-1	- The proposed location SPS-1 (0.81 MLD) is at Zone-1 near Nai Mandi circular road Tiraha. - The proposed site area is under ownership of Urban Improvement Trust (UIT). - The SPS-1 Site is present north to Keoladeo national park at a distance of 2.7 km. - The nearby habitation to the SPS-1 is 35 meters. - The available and required government land at the location is 4700 m² and is 500 m² respectively. - Site is surrounded by Ranjeet Nagar Flood Canal followed by houses on north and Mathura- Bharatpur road on south	 Proposes site of SPS-1 (0.81 MLD) <table><tr><td>Lat</td><td>27°13'38.9"N</td></tr><tr><td>Long</td><td>77°29'60.0"E</td></tr></table>	Lat	27°13'38.9"N	Long	77°29'60.0"E
Lat	27°13'38.9"N						
Long	77°29'60.0"E						
3.	SPS-3	- This proposed site SPS-3 (1.64 MLD) is present at Zone 3, Near Mukherjee Nagar Pulia, abundant PNT Qrarters, Bharatpur. - The proposed site area is under ownership of Urban Improvement Trust (UIT). - The Keoladeo National Park is present at 3.4 km away from the SPS- 3 Proposed location in the south direction. - The Proposed SPS-3 is 85 meters away from the Saint lukes international academy. - Sankat Mochan Hanuman temple is existed at 55 m distance in south-east direction. - The proposed SPS-3 is well connected with the city roads. - The nearby habitation to the SPS-3 is 65 meters away. - The available and required government land at the location is 6800 m² is 600 m² respectively - Site is surrounded by abundant government quarters, Ranjeet Nagar Flood canal and Colony roads	 Proposes site of SPS-2 (1.64 MLD) <table><tr><td>Lat</td><td>27°13'39.0"N</td></tr><tr><td>Long</td><td>77°29'04.6"E</td></tr></table>	Lat	27°13'39.0"N	Long	77°29'04.6"E
Lat	27°13'39.0"N						
Long	77°29'04.6"E						

4.	SPS-4	- This proposed site SPS-4 (2.23 MLD) is present at Zone-4 Deeg road workshop yojna Infront of vaishali agency, Bharatpur. - The proposed site area is under ownership of Urban Improvement Trust (UIT). - There is no impacts on trees and wildlife. - The available and required government land at the location is 4900 m² is 650 m² respectively. - The nearby habitation from SPS-4 is at a distance of 25 meters. - The site is approachable using Bharatpur Marg and Mathura Bypass Road. - The SPS-4 site is situated north to the Keoladeo national park at an approximate distance of 4 km.	 Proposes site of SPS-4 (2.23 MLD) <table><tr><td>Lat</td><td>27°13'31.2"N</td></tr><tr><td>Long</td><td>77°28'28.6"E</td></tr></table>	Lat	27°13'31.2"N	Long	77°28'28.6"E
Lat	27°13'31.2"N						
Long	77°28'28.6"E						
5.	Proposed Disposal Point	- The Proposed site of the disposal is at Bharatpur flood control drain. This drain starts at Bharatpur and ends near mandolin (Uttar Pradesh). - Nearest habitation to the disposal point is 120 meters in north-west direction. - The disposal point is approximately 280 meters away from the STP Location. - The Site is approachable through Agra Bharatpur Road. - The Keoladeo National Park is at southern direction and present at a distance of 3.08 km from the Disposal Site.	<table><tr><td>Lat</td><td>27°12'25.0"N</td></tr><tr><td>Long</td><td>77°32'43.7"E</td></tr></table>	Lat	27°12'25.0"N	Long	77°32'43.7"E
Lat	27°12'25.0"N						
Long	77°32'43.7"E						

VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Introduction

156. 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.

157. 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 worker's 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; and
- (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.

158. 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).

159. 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.

160. 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

161. **Location Impacts of Sewage Treatment Plants.** STP (9.4 MLD) is proposed on govt. land at adjoining of existing 5& 8 MLD STPs in Naglagopal, Ikran Village. This govt. land is under ownership Nagar Parishad Bharatpur. There are no tree cover in the proposed land. This land is open land. There are only agricultural activities in the periphery of this site. There is no habitation within 250 m of the proposed site, however a cattle shed is existed at 75 m meter distance in north-east direction. No wildlife and forest area are reported in the adjoining areas. There are some agricultural activities around this site and treated effluent and sludge from STP can be utilized in these agricultural practices. The treated effluent will be disposed in the Bharatpur fold control drain which is existed at 280 m aerial distance in north direction. There is no habitant in 120 m periphery.

162. **Odour Nuisance from STP.** As presented in the baseline profile, the proposed STP site is identified away from habitation, and sites are 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, odour nuisance will be very minimal. Limited bad odours 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 odour generating units (such as sludge/solids handling facilities) are located away from the surrounding area with future development potential.

163. **Reuse/discharge of treated effluent.** It is proposed reuse the treated effluent for use in agriculture, horticulture, development of urban forestry etc. and remaining treated effluent from STP is proposed to dispose by gravity in Bharatpur flood control drain by gravity. 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

164. **Location Impacts of proposed SPS sites-** (i) SPS-01 (0.81 MLD) Near Nai Mandi Circular Road Tiraha in Zone-01, (ii) SPS-03 (1.64 MLD) Near Mukherjee Nagar Pulia, PNT Quarters in Zone-3, and (ii) SPS-04 (2.23 MLD) Deeg Road, Workshop Yojna Infront of Vaishali agency in Zone-04. Most of the Land is low lying and accumulated area where wastewater from nearby areas is accumulated. No wildlife exists near the proposed sites. Some shrubs are present at proposed site, few trees of kikkar and babool are 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. All the precautions should be taken during construction and operation to minimize the impacts on nearby residents. Proposed SPS-1 location is existed on Mathura- Bharatpur Highway and there are some motor service station and shops are existed at 35 m distance in north-west side. As similar to SPS-3 site SPS-4 site is also existed in commercial area where are some motor service stations are existed at 35 meter distance from SPS 3 and nearest distance to SPS 4 is 25 m. Both SPS site are propped on govt. land and located near the commercial areas. At above mentioned both SPS site, sewer will be collected by gravity and there are no suitable locations therefore these sites are selected whereas some commercial properties are existed in surrounding location at 25-50 m radius. Proposed SPS-3 site is located near Mukherjee Nagar Pulia where a small Sankat Mochan Hanuman Temple is situated at 55 meter distance in south-east direction. Although this temple is sensitive receptor but there are no resident inside the Temple. This SPS site is also, under Nagar Parishad Bharatpur ownership and sewer will be collected by gravity in this SPS.

165. Except STP which is at south-east side, all Project components are proposed at northers side of Bharatpur town and the KNP is situated at Southern side of town. The nearest component to KNP is SPS1 proposed about 2736 m form outermost boundary of eco-sensitive zone and about 2200 m from national park's boundary

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

167. **Tree cutting at project sites.** There is no notable tree cover or vegetation in STP (9.4

MLD) site and SPS sites. Sewers will be laid along the road within road ROW. There are no notable trees in the alignment; thus, 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, 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.

168. During detail design DBO contractor will be required to confirm that there will be any tree will be impacted or not. Tree cutting requirement for pipe line works can be decided only after confirmatory survey of full length of alignment by contractor. As per RUDSICO-EAP policy; compensatory plantation in the ratio of 1:3 is to be followed during construction works.

169. **Physical Cultural Resources.** There are notable and significant archaeological places, protected monuments and areas in Bharatpur town, but subproject components are located at sufficient distance from these protected monuments. 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) develop a protocol in conducting any excavation work, to ensure that any chance finds are recognised and measures are taken to ensure they are protected and conserved.
- (ii) Conduct awareness training to contractor & supervision staff prior to start of excavation;
- (iii) Stop work immediately to allow further investigation if any finds are suspected;
- (iv) Inform local Archaeological Department if a find is suspected and take any action, they require to ensure its removal or protection in situ; and prepare a chance find protocol

2. Design Impacts

170. **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 sewerage components. It is proposed to consider 2055 as the design year for all the components in order to maintain unanimity in the design period and design population. Accordingly, 2025 shall be the base year and 2040 the intermediate year to cross check the designs pertaining to intermediate demand. The rate of water supply has been taken as 135 lpcd for 100% population. Sewage generation is 85% of water supply (including 5% to account for infiltration).

171. **Design of Sewage Treatment Plant.** One STP of capacity 9.4 MLD and is proposed to be constructed at the identified sites to treat the sewage generated from Bharatpur Town. It is proposed to establish STP based on SBR (sequential batch reactor) process, followed by disinfection by chlorine. 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

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

base the STP design on discharge standards for STPs suggested by CPCB in 2015, which are more stringent. The strident standards also facilitate maximum utilization of treated wastewater for reuse in various purposes following the Sewerage and Wastewater Policy, 2016 of Rajasthan.⁷ It is also to be noted that in April 2019, the National Green Tribunal (NGT) in one of its orders directed MOEFCC to reconsider stringent standards for STPs.

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

S. No	Parameter	Proposed Discharge Standards for Bharatpur 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	Faecal Coliform,	<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.

172. 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, especially 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 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

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”.

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.

173. 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 5**).

174. **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.

175. **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.

176. **Reuse Plan.** The State Policy requires the sewerage detailed project report provide reuse options and strategy to implement reuse, and detailed reuse action plan. As the Bharatpur 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 Bharatpur, 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 Bharatpur, 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 Bharatpur, 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

177. 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 food 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 litre. Effluent used for the irrigation of food crops, sports fields, public parks, should have and less than one viable nematode egg per litre and less than 1,000 faecal coliforms per 100 millilitres (ml). These shall be considered in the reuse plan that will be prepared during the detailed design and complied accordingly.

178. 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). 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 monitoring:

- (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.

179. 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.

180. 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.

181. 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.

182. Contractor will propose the sludge management plan with best methods for reuse of sludge as per guidelines of CPHEEO (guidelines are attached as **Appendix 18**) 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

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)
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			
Odour		Absence of foul Odour	
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			

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

- (i) Prepare a dried Sludge utilization plan for Bharatpur 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).

184. **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.

185. 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, Bharatpur Nagar Nigam 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.

186. 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.

187. 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 sulphide 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.

3. Due diligence of associated/existing facilities

188. It is designed to utilize existing sewerage infrastructure like STP, Pumping mains 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.

189. All the existing infrastructure facilities are located in urban areas within Bharatpur town. All these components are located away from state or centrally protected environmental or archeologically sensitive areas and monuments such as forests, wildlife sanctuaries or protected historical sites. Mitigation measures are designed to mitigate any negative impact of subproject around these areas. Required permission and clearances as discussed in above sections will be taken before start of construction in specific section. 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.

190. At present there are two existing STPs in Bharatpur one 8 MLD constructed under RUIDP phase – 2, and one 5 MLD construction in AMRUT Project. The pumping mains from SPS-1, SPS-3 and SPS-4 will pump water into existing pumping mains of 8 MLD STP to transfer collected sewerage to STP campus and this 8 MLD STP is associated with proposed subproject. 5 MLD STP constructed under AMRUT is separate from the proposed subproject components. Therefore, environmental audit of 8 MLD STP is conducted and findings are summaries below. The detailed Audit report is attached in Appendix 25.

- (i) As per government requirements, construction and operation of STPs requires, consent to establish (CTE) prior to start of construction, and consent to operate (CTO) prior to start of operation. At present, 8 MLD STP has valid CTO from RSPCB upto August 2024.
- (ii) 8 MLD STP design on SBR treatment process to meet latest norms for wastewater disposal into inland water bodies including, BOD < 10 mg/l, Total Suspended Solids < 20 mg/l, Fecal coliform < 100/100 ml. STP is treating effluent as per required standards. The lab results resister for month of March – May 2022 confirms the STP is working on required efficiency and treating sewerage as per required parameters.
- (iii) STP has Sludge management system components: Gravity thickeners for sludge from clarifiers, mechanical sludge dewatering system but No sludge drying bed were constructed for existing STP
- (iv) **Corrective action plan** – Proposed STP is designed with sludge drying bed for both new and existing STPs (layout of STP showing proposed sludge drying bed is presented in Appendix 25)

C. Pre-construction Impacts

191. **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 contact 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.

192. 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.

193. 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.

194. Debris disposal. Prior to the commencement of works, contractor shall identify a debris disposal site in consultation with the PIU and Consultant. Contractor will prioritize, if available, the use of solid/construction waste disposal sites operated under the consent from RSPCB. Contractor will follow all the prescribed rules⁸ during construction and adhering to following criteria (including but not limited to)-

- (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

⁸Construction and Demolition Waste Management Rules 2016

- (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

D. Construction Impacts

195. 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.

196. **Laying Sewer Networks.** Subproject include linear works (sewage collection pipes). The maximum depth for sewers depends on the design, and in Bharatpur 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.

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

198. 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.

199. **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.

200. **Storage and Disposal of excavated earth.** A large quantity of soil will be excavated for pipe laying, 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. Contractor will prioritize, if available, the use of solid/construction waste disposal sites operated under the consent from RSPCB. If not available, prior to the commencement of works, Contractor will follow all the prescribed rules⁹ 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; and
- (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.

201. **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:

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

- (i) Use material sources permitted by government;¹⁰
- (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

202. **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; and
- (xii) Conduct ambient air quality monitoring periodically as per Environmental Management Plan EMP.

203. **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 to construct any construction camps and labour camps near to any water body and do not allow to dispose any waste or sillage in to any water body;

¹⁰CTE and CTO will be required for batching plant, hot mix plant, crushers etc. if specifically established for this project. If contractor is purchasing raw material or ready mix concrete, asphalt/macadam and aggregates from third party, he has to be assured that third party is having CTE/CTO from RSPCB and should collect the copy of these and submit to PIU/consultants. Quarry sites should also have the desired permissions.

- (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).

204. **Noise and Vibration Levels.** Construction works will be conducted along the roads in Bharatpur 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;
 - (xiii) Consult in advance with habitants and inform them about the nature and duration of works; and
 - (xiv) Conduct noise monitoring according to the Environmental Management Plan (EMP).

205. 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, resident's 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 are 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 (lx)	Areas to be illuminated	Type of work activity
54	Illumination throughout the work area	General work area lighting, and performance of visual tasks of large size, or medium contrast, or low require accuracy
108	Illumination of work area and areas adjacent to equipment	Performance of visual tasks of medium size, or low to medium contrast, or medium required accuracy

216	Illumination of task	Performance of visual tasks of small size, or low contrast or high required accuracy or fine finish
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- (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 day time 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 contractor's safety personnel should closely monitor the safety of works continuously and noise and illumination levels on hourly basis and maintain photographic and video graphic 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; and
- (xxxi) Night works should not be conducted near hospitals and during peak seasons such as peak tourist season, students' exam times etc.

206. **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.

207. **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 10**);
- (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).

208. **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 11**);
- (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.

209. 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; and
- (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.

210. **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 10**);
- (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;
- (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; and
- (ix) Provide all mitigation measures as given in resettlement plan (RP) prepared for the project to mitigate impacts on vendors and shopkeepers.

211. **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.

212. **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 9**);
- (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 Training¹¹ for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents;
- (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; and
 - 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

¹¹ Some of the key areas that may be covered during training as they relate to the primary causes of accidents include (i) slips, trips and falls; (ii) personal protective equipment; (iii) ergonomics, repetitive motion, and manual handling; (iv) workplace transport; and (v) legislation and responsibilities. Training can provide the foundations of competence but it does not necessarily result in a competent worker. Therefore, it is essential to assess staff competence to ensure that the training provided is relevant and effective. Supervision and monitoring arrangements shall be in place to ensure that training has been effective and the worker is competent at their job. The level of supervision and monitoring required is a management decision that shall be based on the risks associated with the job, the level of competence required, the experience of the individual and whether the worker works as part of a team or is a lone worker.

- (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.

213. Health and safety risk during sewer works. Subproject also includes adding missing links in the existing sewer system and may involve working on existing operational sewage lines. These works may present harmful working conditions due to accumulation of sewage, sludge and gases. Appropriate measures suggested including no manual working, supervisory control, safety equipment etc., These work sites may present hazardous or harmful working conditions due to accumulation of harmful gases such as hydrogen sulphide in the existing / old sewers, and lack of sufficient oxygen may endanger the lives of workers if care is not taken. Following measures shall be implemented:

- (i) Contractor and supervising staff should assess the conditions prior to start of work with necessary safety precautions; Gas detector shall be used to measure the level of harmful gases
- (ii) Works shall be conducted only under appropriate supervisory control
- (iii) Appropriate equipment shall be used, and manual working shall not be conducted, such as entry of workers into old sewers etc.,
- (iv) Adequate ventilation shall be maintained, workers on the site shall be provided with appropriate PPEs including oxygen masks and cylinders etc.,
- (v) Implement a site specific Health and Safety (H&S) Plan for sewer rehabilitation works

214. 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:

- (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; and
- (iv) Provide road signs and flag persons to warn of on-going trenching activities.

215. 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.

216. **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) Provide 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 accommodation¹² 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 20**);
- (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.

217. **Social and Cultural Resources:** For this project, excavation will occur at locations not

¹² https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_gpn_workersaccommodation

known to have archaeological values, so there is no risk of such impacts. Religious places such as temples are present nearby the proposed pipeline works 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/hindrances/obstacles during such time to the religious places; and
- (iv) provide proper signage, barricades etc. to protect public and devotees from dangers of construction works.

218. 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 CAPPC. 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;
- (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; and
- (ix) Locate entry and exit points in areas where there is low potential for traffic congestion.

219. 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; and

- (iv) Excavate only that stretch in a day that could be finished in the same day by laying of pipes and backfilling.

E. Operation and Maintenance Impacts

220. **Sewerage System:** O&M of the sewerage system will be carried out by DBO contractor for 10 years and then by Bharatpur 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.

221. 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 into 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.

222. 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.

223. 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.

224. 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 21**;
- (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; and
- (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.

225. There are also certain environmental risks from the operation of the sewer system, most notably from leaking sewer pipes as untreated faecal material can damage human health and contaminate both soil and groundwater. It will be imperative therefore that the operating agency establishes a procedure to routinely check the operation and integrity of the sewers, and to implement rapid and effective repairs where necessary. There is an occupation health risk to workers engaged in sewer maintenance activities. Following measures should inter alia be followed:

- (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:
 - a. As far as possible use remote/CCTV mechanism to identify/detect the problems in sewers and do not engage persons for this purpose;
 - b. 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;
 - c. Ensure that maintenance staff and supervisors understand the risks; provide proper instructions, training and supervision;
 - d. Use gas detector to detect any hazardous or inflammable gas in confined areas like sewers/manholes prior to maintenance process;
 - e. 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;
 - f. Provide adequate welfare facilities, including clean water, soap, nail brushes, disposable paper towels, and where heavy contamination is foreseeable, showers;
 - g. For remote locations portable welfare facilities should be provided;
 - h. Areas for storage of clean and contaminated equipment should be segregated and separate from eating facilities;

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

226. 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 diarrhoea, 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.

227. **Operation of FSSM.** Households of 65 Wards (refer Table 1) 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.

F. Cumulative Impacts

228. 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 and sewerage in Bharatpur Town, by rehabilitating, augmenting, and creating required new infrastructure.

229. sewerage works is proposed to be taken up simultaneously in Bharatpur Town, which is a 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 Bharatpur is a developing town. Given dry and windy weather conditions, dust generation from cumulative construction activities may be significant, and this may increase the particulate matter concentration in ambient air. Dust control measures suggested in the EMP aim to minimize the dust generation from the subproject construction activities. Suggested trenchless method, by avoiding excavation, will also help in reducing the overall dust generation from the subproject activities. If there are any road improvement works proposed to be implemented in Bharatpur, scheduling of works needs to be coordinated with the respective road agency (ULB or Public Works Department [PWD]) so that improved roads are not subjected for excavation. There is also

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

230. **Project Benefits.** The citizens of the Bharatpur will be the major beneficiaries of the sewerage systems, as (i) 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 diarrhoea and dysentery, should be reduced, so people should spend less on healthcare and lose fewer working days due to illness, so their economic status should also improve, as well as their overall health.

VII. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. Overview

231. 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.

232. 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, Bharatpur Nagar Nigam Public Health Engineering Department, and Rajasthan Pollution Control Board. Secondary stakeholder is: 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

233. 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 Bharatpur in August 2019, July 2021 and December 2021 (**Appendix 12**).

C. Consultation during Project Preparation

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

235. 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.

236. It was observed that people are willing to extend their cooperation as the proposed activities are supposed to enhance the infrastructure service levels and the living standard of the public. The public expressed their concern regarding the nuisance and disturbance (dust, road closure and traffic management activities) during the construction stage which can have impact on their day-to-day activities. Public demanded for advance notice before construction and proper warning signs along the construction area to avoid accidents and inconvenience. Public opined that an appropriate operation and maintenance system should be in place, especially for

sewerage system, for its best functioning and to have the maximum health and aesthetic benefits. Regarding sewerage works people were demanding sewage house connections in whole town because they are suffering a lot due to unsafe sewage disposal in drains. 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. Details of public consultations are given in **Appendix 12**.

237. A City Level Committee (CLC) in town has been formed in Bharatpur 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 Bharatpur in District Head Quarter, Bharatpur on dtd. 24.07.2021 to discuss the matter of proposed Sewerage works in Bharatpur under the chairmanship of District Collector, Bharatpur, in presence of, 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 and it was decided that treated effluent shall be reused by Municipality in beneficial uses and for generation of revenue by ULB. Land availability for the proposed components was also confirmed by local authority. 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 12**.

238. A town level consultation/workshop was organised in Meeting Hall of Municipal Corporation, Bharatpur on October 10, 2022. Meeting was attended by 42 stakeholders including public representatives, government departments and ADB consultants. Another Town level consultation was conducted in Bharatpur on January, 18 2023 in the Meeting Hall. All ward wise public representatives, news reporters, prominent persons and officers from RUIDP, Nagar Nigam, administration and PHED was invited for meeting. ADB team members and consultants also participated. 45 persons attended the meeting, expressed support to the project. Details of these meetings and photographs are attached in Appendix 3.

D. Consultation During Construction

239. Prior to start of construction, Bharatpur Nagar Nigam 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/neighbourhood 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.

240. 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 Nigam/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.

E. Information Disclosure

241. Executive summary of the IEE will be translated in the local language and made available

at the offices of Nagar Nigam, RUDSICO-EAP- PMU and PIU. Copies of summary will be provided to participants of city level workshop to be organized in Bharatpur. 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 Nigam/RUDSICO-EAP after approval of the IEE by Government and ADB. Stakeholders will also be made aware of grievance register and redress mechanism.

242. 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.

243. Local communities will be continuously consulted regarding location of construction camps, access and hauling routes and other likely disturbances during construction. The road closure together with the proposed detours will be communicated via advertising, pamphlets, radio broadcasts, road signage, etc.

VIII. GRIEVANCE REDRESS MECHANISM

A. Project Specific Grievance Redress Mechanism

244. 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)¹³ the system was effective in timely resolution of grievances in a transparent manner.¹⁴ 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.¹⁵

¹³ 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.

¹⁴ 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.

¹⁵ Continued logistics support at field level will be key to successful management of grievance redress under RSTDSP.

245. **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.

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

B. Grievance Redress Process

247. 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 site¹⁶ or by sending a WhatsApp message to the PIU¹⁷ or by dialling the phone number of town level PIU/CAPPC or by dialling a toll-free number.¹⁸ 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.¹⁹ 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 personnel 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

The target date for establishment of the first level (PIU level) and second level (Zonal level) of GRM is before loan negotiation.

¹⁶ 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.

¹⁷ 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.

¹⁸ Project contractors in all project towns will have a toll-free number with specific working hours for registration of grievances related to RSTDSP.

¹⁹ <http://www.sampark.rajasthan.gov.in/RajSamWelcome.aspx>

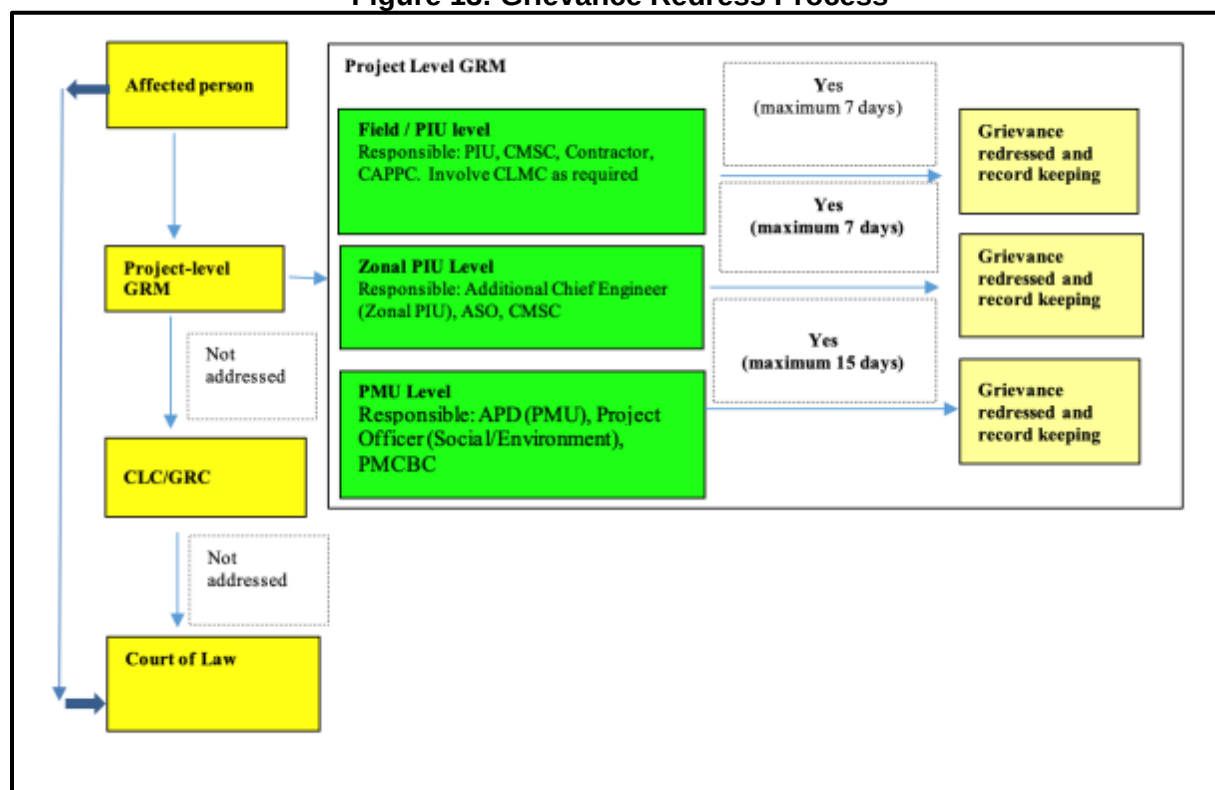
- of a complaint/grievance. If required, city level monitoring committee (CLMC)²⁰ will be involved in resolution of grievances at the 1st level;
- (ii) **2nd level grievance.** All grievances that cannot be redressed within 7 days at field/PIU level will be brought to the notice of Zonal PIU headed by 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, CAPP and the contractor; and
 - (iii) **3rd level grievance.** All the grievances that are not addressed by Zonal PIU within 7 days of receipt will be brought to the notice of the PMU. Depending on the nature of grievance, the project officer (social/environment) at PMU will resolve the grievance within 15 days of receipt of grievance with necessary coordination of Zonal PIU and CMSC and guidance/instruction of additional project director (APD-PMU).
 - (iv) Grievances not redressed through this process within/at the project level within stipulated time period will be referred to the CLC/GRC, which has been set up.²¹ 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.

248. The multi-tier GRM for the project is outlined below (**Figure 13**), 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.

²⁰ 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.

²¹ 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 13: 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.

249. 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), 2013.²²

250. 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.²³

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

²²The Authority admits grievance only with reference to the Land Acquisition and R&R issues under the RFCTLARRA, 2013.

²³ Accountability Mechanism. <http://www.adb.org/Accountability-Mechanism/default.asp>.

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. The sample grievance registration format is attached as **Appendix 15**.

252. **Periodic review and documentation of lessons learned.** The PMU Project Officers (Social and 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.

253. **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.

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

IX. ENVIRONMENTAL MANAGEMENT PLAN

A. Environmental Management Plan

255. 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.

256. 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.

257. 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.

Table 18: 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 4 for detailed parameters) including: BOD < 10 mg/l Total Suspended Solids < 20 mg/l Faecal coliform < 100/100 ml	RSPCB, Consent etc.,	Consultants / PMU	Project Costs
	Odour nuisance and aesthetics	(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 visual screen around the facility and will improve the aesthetic appearance. Treated wastewater shall be used for plantation. (ii) Develop layout plan of STP such that odour generating units (such as sludge / solids handling facilities) are located away from the surrounding area with future development potential.	DBO Contractor / PIU	PMU	Project costs
	Impairment of STP treatment efficiency	Ensure continuous uninterrupted power supply (i) Provide back-up facility (such as generator) and make sure that adequate fuel supplies during operation for running of generator when required; (ii) 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.	RSPCB Consent etc.	Consultants / PMU	Project Costs

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
		(iii) 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 Bharatpur Nagar Nigam (iv) Design should include online monitoring for the minimum BOD, pH and Ammonia at the inlet and outlet of the plant			
	Mixing of industrial effluent with sewage	No industrial wastewater shall be allowed to dispose into municipal sewers No domestic wastewater from industrial units shall be allowed into municipal sewers (i) Ensure that there is no illegal discharge through manholes or inspection chambers (ii) Conduct public awareness programs; in coordination with RSPCB, issue notice to all industries for compliance (iii) Conduct regular wastewater quality monitoring (at inlet and at outlet of STP) to ensure that the treated effluent quality complies with the standards	ULB/PIU and RSPCB Consent etc.	PIU / ULB	Project Costs
Location impacts of proposed components	Nearby community may be affected due to increased pollution during construction and operation	(v) sites should be selected so that nearby community may have no or minimum impact due to proposed works (ii) Mitigation measures are prepared and included in design and EMP is attached with contract documents	List of pre-approved sites for -construction work camps, areas for stockpile, storage and disposal -Waste management plan	Consultants/PMU	No cost required
Seismic sensitivity	Damage to infrastructure and potential risks: project area in moderate	(i) Designs of project component structures shall comply with relevant codes of design such as Bureau of Indian Standard (BIS) specifications for earthquake resistant	Detail design considering risk of earthquake in town	DBO contractor/PIU	DBO contract or

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
	earthquake risk zone (Zone III)	design (IS: 1893: Criteria for earthquake resistant design of structures).			
Requirement of tree cutting	Tree cutting may result loss of aesthetics and increase in air pollution	(i) sites should be selected so that minimum tree cutting is required (ii) project documents should include the minimum tree cutting provisions (iii) Provision for Compensatory plantations should be included in contract documents	As per RUDSICO-EAP policy; Tree Cutting Approvals; Compensatory Afforestation Plan;	Consultants/PIU/PMU	No cost required
Energy Efficiency	Loss of natural resources	(vi) Use energy efficient electrical equipment (vii) Provision of use of energy efficient equipment in contract agreements and BOQ	As per BEE norms	Consultants/PMU	No cost required
Preparation of treated effluent reuse plan (During SIP)	Loss of natural resource of water, improvement of local income	Contractor to develop, design, implement and operate the treated effluent reuse plan in consultation with the ULB	Approved Plan included in the Contractor's Scope of Works	Contractor/PMU	Project Costs
Preparation of Sludge reuse plan (During SIP)	Loss of natural resource of water, improvement of local income	Contractor to develop, design, implement and operate the sludge reuse plan in consultation with the ULB	Approved Plan included in the Contractor's Scope of Works	Contractor/PMU	Project Costs
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
STP	Use of treated wastewater for reuse applications	Develop wastewater reuse plan for Bharatpur town in consultation with CLC as per the Sewerage and Wastewater Policy,	DBO Contractor / PIU	PMU/ ULB	Project cost

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
		2016. The Reuse Plan shall inter alia include the following: (i) Identify potential reuse application in Bundi, 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 Bundi, 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) (v) Carryout regular / online monitoring of critical quality parameters of treated wastewater to ensure that they meet the preset standards established for reuse			
STP	Treated effluent discharge into water channel/drains and associated impacts on river water and downstream users	(i) Obtain of consent of RSPCB for discharge of treated wastewater into drains (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	DBO Contractor/PIU	PMU/ ULB	Project costs

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
		(iv) Monitor water quality periodically during operation phase as per the Environmental Monitoring Plan			
STP	Sludge management and reuse	(i) Prepare a sludge management plan (ii) Prepare a dried Sludge utilization plan for Bundi within the help of Agriculture Department / CLC; plan should also include if any additional processing is required for sludge to use as soil conditioner (iii) Plan should clearly various potential uses and demand in Bundi and surroundings (iv) 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. (v) Identify a landfill / suitable site for disposal of surplus dried sludge (vi) Monitor sludge quality during operation phase as per the Environmental Monitoring Plan, ensure that it meets the quality parameters established by FCO (vii) 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)	DBO Contractor/PIU	PMU/ ULB	Project costs
FSSM	Occupational health and safety issues, and impact on STP process	(i) Conduct detailed survey of the households to be covered with FSSM to design the system to suit the local conditions, such as type of septic tanks and their	DBO Contractor/PIU	PMU/ULB	Project costs

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
		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 (vii) Ensure proper facilities for workers including showers, wash areas, toilets, drinking water, eating and resting places (viii) Conduct regular health checks (ix) Prepare Health and Safety Plan for FSSM			
Physical Cultural resource	Encroachment/ damage to protected monuments and chance finds	(i) develop a protocol in conducting any excavation work, to ensure that any chance finds are recognised and measures are taken to ensure they are protected and conserved. (ii) Conduct awareness training to contractor & supervision staff prior to start of excavation; (iii) Stop work immediately to allow further investigation if any finds are	PIU	PMU	Project Cost

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation/ Monitoring	Cost and Source of Funds
		suspected; (iv) Inform local Archaeological Department if a find is suspected and take any action, they require to ensure its removal or protection in situ; and prepare a chance find protocol			

Table 19: Environmental Management Plan of Anticipated Impacts during Pre-Construction

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
Compliance with environmental subproject selection criteria	Environmental impacts due to subproject	Compliance with environmental subproject selection criteria A compliance checklist is appended to this report (Appendix 8)	Consents, permits, clearance, NOCs, etc. A compliance checklist is appended to this report (Appendix 8)	PIU and Bharatpur Nagar Nigam	PMU	No costs required
Legal compliance	Environmental legal noncompliance may attract legal actions Failure to obtain necessary consents, permits, NOCs etc. can result to design revisions and/or stoppage of works	(i) Obtain all consents, clearances (CTE/CTO from RSPCB), permits NOCs etc. before start of construction works Ensure that all necessary approvals for construction to be obtained by contractor are in place before start of construction	Consents, permits, clearance, NOCs, etc.	PIU/Consultants in coordination of Nagar Nigam, Bharatpur	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 Source and of Funds
		Refer tables in previous sections 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, and water 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 10) and traffic	-List and maps showing utilities to be shifted -Contingency plan for services disruption	Contractor in collaboration with PIU and with approval of PMU	CMSC/ PIU	No cost required. Mitigation measures are part of TOR of PMU, PIU and Consultants

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost Source and of Funds
		management plan (Appendix 11)				
Construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.	Conflicts with local community; encroachment in sensitive areas; disruption to traffic flow and sensitive receptors	(i) Prioritize areas within or nearest possible vacant space in the project location; (ii) If it is deemed necessary to locate elsewhere, consider sites that will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems; (iii) Do not consider residential areas; (iv) Take extreme care in selecting sites. (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	-PMU approval sites for construction work camps, areas for stockpile, storage and disposal -Waste management plan	Contractor to finalize locations in consultation and approval of PIU	CMSC/ PIU	No cost required. Mitigation measures are part of TOR of PIU and Consultants and also part of contractual terms

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost Source and of Funds
		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 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	(i) Prioritize sites already permitted by the Department of Mines and Geology	Permits issued to quarries/sources of materials	Contractor to prepare list of approved quarry sites and sources	CMSC/ PIU	No cost required. Mitigation measures are

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
	resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.	(ii) If other sites are necessary, inform construction contractor that it is their responsibility to verify the suitability of all material sources and to obtain the approval of PMU and (iii) If additional quarries will be required after construction is started, inform construction contractor to obtain a written approval from PIU.		of materials with the approval of PIU		part of TOR of PIU and Consultants and also part of contractual terms
Consents, permits, clearances, NOCs, etc.	Failure to obtain necessary consents, permits, NOCs, etc. can result to design revisions and/or stoppage of works	(i) Obtain all necessary consents (including CTE for STP from RSPCB), permits, clearance, NOCs, etc. prior to award of civil works. (ii) Following consents are required- Tree cutting- local authority Storage, handling and transport of hazardous materials- RSPCB Sand mining, quarries, borrow	Consents, permits, clearance, NOCs, etc.	PIU and Consultants	CMSC/ PIU	No cost required. Cost of obtaining all consents, permits, clearance, NOCs, etc. prior to start of civil works responsibility of PIU. Mitigation measures are part of TOR of PIU and Consultants

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

Table 20: 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.
Water quality	Mobilization of settled silt materials, and	(i) Prepare and implement a construction waste / spoils management plan (Appendix 10)	-Periodic Water Quality Monitoring;	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	chemical contamination from fuels and lubricants during installation of pipelines can contaminate nearby surface water quality.	(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).				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, fitting jackhammers with noise-reducing mufflers, and portable street barriers the sound impact to surrounding sensitive receptor; and (iv) Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at a distance of 10 m or more from the vehicle/s. (v) Quarterly environmental monitoring for ambient noise as per EMP	-No complaints from sensitive receptors; - Periodic Noise level monitoring reports;	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
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	-Complaints from sensitive receptors; -CTO and CTE compliance; -Periodic GW Quality Monitoring Reports;	Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
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 10); (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	As per Appendix 10.	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
		(viii) Request PIU to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.				
Existing Infrastructure and Facilities	Disruption of service and damage to existing infrastructure at specified project location	(i) Obtain from PIU the list of affected utilities and operators if any; (ii) Prepare a contingency plan to include actions to be done in case of unintentional interruption of service (iii) inform nearby community in advance about the nature and timings of disturbance	As per contingency plan	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Ecological Resources – Terrestrial	Loss of vegetation and tree cover	(i) Minimize removal of vegetation and disallow cutting of trees; (ii) If tree-removal will be required, obtain tree-cutting permit from the Revenue Department; and (iii) Plant three native trees for every one that is removed.	-Records -Plant native tree species as per RUDSICO-EAP Policy	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Land use	Environmental Issues due to land use change	The impact due to change in land use will be negligible due to this project.	-Latest land use records	Not applicable	PMU/ 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;	As per Traffic Management Plan given in Appendix 11.	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
		(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. (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 10). 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.	-Visible and understandable sign boards in construction zone; -Construction Implementation Schedule	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
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	-Employment records	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 9 of this IEE) (B) Ensure that qualified EHS personnel is deputed to look the H&S matter (i) Develop and implement site-specific occupational health and safety (OH&S) Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use personal protective equipment like helmet, gumboot, safety belt, gloves, nose musk and ear plugs; (c) OH&S Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) 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	-Visual inspection -Records -Work schedule -Noise level monitoring in work area -Visible first aid equipment and medical supplies -Condition in H&S plan -Area secured -Trenches barricaded -Supply of water -Providing clean drinking water in worker areas. -Visible and understandable sign boards in construction zone -H&S plan including appropriate	Construction Contractor		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
		affect the health of workers engaged in construction work. Contractor should take necessary measures during summers including the following: (a) work schedule should be adjusted to avoid peak temperature hours (12 – 3 PM); (b) provide appropriate shade near the work place; allow periodic resting and provide adequate water, and (c) provide necessary medicine and facilities to take care of dehydration related health issues (v) Provide supplies of potable drinking water; (vi) Provide clean eating areas where workers are not exposed to hazardous or noxious substances; (vii) Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective 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	signs for each hazard present -Construction vehicles condition in H&S plan.			

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and (xii) Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively. (xiii) Provide proper solid and liquid waste management program in workers' campsite, separate from spoils and debris disposal, as their presence can add to existing waste volume at the project sites.				
Occupational health and safety risks	Works on existing sewer lines to add missing links may pose harmful / hazardous conditions endangering workers life of workers	- Contractor and supervising staff should assess the conditions prior to start of work with necessary safety precautions; Gas detector shall be used to measures the level of harmful gases - Appropriate equipment shall be used, and manual working shall not be conducted, such as entry of workers into old/existing sewers etc., - Adequate ventilation shall be maintained, workers on the site shall be provided with appropriate PPEs including oxygen masks and cylinders etc., Implement a site specific Health and Safety (H&S) Plan for sewer rehabilitation works	Implementation of Health and safety plan for sewer rehabilitation works	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
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 11.	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 liveability 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 16).	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 equipment 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 damage/disturbance to 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.	Chance find protocol	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(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, (viii) 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 measure 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 19	As per monsoon preparedness plan & as per Appendix 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	PIU/Consultants	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 23)				
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 re-grassed 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 21: 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 14	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 11 and all the safety measures such as PPE's etc. Site inspection will be done as per checklist is given in Appendix 14 .	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	Bharatpur Nagar Nigam/O&M contractor	Bharatpur Nagar Nigam	DBO contractor cost O&M Cost
Check the leakages blockages, overflow problem in sewers	Occupational health & safety: for personnel cleaning underground sewers there is a risk due to oxygen deficiency and harmful gaseous emissions (hydrogen sulphide, carbon monoxide, methane, etc.);	(i) Provide necessary health & safety training to the staff engaged sewer cleaning & maintenance (ii) provide appropriate personal protection equipment (including oxygen masks)	-Training and Awareness campaign for Occupational, Health & Safety to ensure the use of PPE's.	Bharatpur Nagar Nigam/O&M Contractor	Bharatpur Nagar Nigam	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	Bharatpur Nagar Nigam/PHED/ O&M Contractor	Bharatpur Nagar Nigam/PHED/ O&M Contractor	Bharatpur Nagar Nigam/PHED/ O&M Contractor
Treated effluent quality	Water pollution of the receiving body if treated	Regular monitoring (parameters tests) of treated	Test results records	Bharatpur Nagar	Bharatpur Nagar	Bharatpur Nagar

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost Source and of Funds
	effluent does not meet the standards set by CPCB/RSPCB	effluent quality Follow all the parameters given in CTE/CTO		Nigam/O&M Contractor	Nigam/O&M Contractor	Nigam/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	Bharatpur Nagar Nigam/O&M Contractor	Bharatpur Nagar Nigam/O&M Contractor	Bharatpur Nagar Nigam/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	Bharatpur Nagar Nigam/O&M Contractor	Bharatpur Nagar Nigam/O&M Contractor	Bharatpur Nagar Nigam/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 Nigam, Bharatpur	Nagar Nigam, Bharatpur	Nagar Nigam, Bharatpur

Table 22: 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 14	Weekly during construction	Supervising staff, EHS officer and safeguards specialists	No costs required
Tree cutting	STP, SPS, Pipe laying, 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	5 locations (STP-1, SPS-3, Pipe laying-1) during construction)	PM ₁₀ , PM _{2.5} , NO ₂ , SO ₂ , CO	Quarterly except Monsoon period	Contractor	Contractor
Ambient noise	5 locations (STP-1, SPS-3, Pipe laying-1) during construction)	Day time and night time noise levels	Quarterly	Contractor	Contractor
Ground Water quality	4 locations (STP-1, SPS-3) during construction	pH, TDS, Total Hardness, Zn, Chloride, Iron, Copper, DO, Manganese,	Quarterly except Monsoon period	Contractor	Contractor

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost Source & of Funds
		Suplhate, Nitrate, Fluiride, Hg, Cadmium, Cr ⁺⁶ , Arsenic, Lead, Total Alkalinity, Phosphate, Phenolic compound			
Soil quality	4 locations (STP-1, SPS-3.) 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

Table 23: Environmental Monitoring Plan of Anticipated Impacts during Operation

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
Monitoring of raw sewage quality	Inlet of the STP	Suspended solids, pH, Temperature Oil and grease, Total residual chlorine, Ammonical nitrogen (as N), BOD, COD, Nitrate Nitrogen The values should be within the limit specified by CPCB to discharge into municipal sewers (see Appendix 4)	As per O&M Plan	O&M Contractor/Nagar Nigam	O&M Contractor/Nagar Nigam
Monitoring of treated effluent quality	Outlet of STP	pH, BOD, COD, TSS, NH ₄ -N, N-total, Fecal Coliform (as per Appendix 4)	As per O&M Plan	O&M Contractor/Nagar Nigam	O&M Contractor/Nagar Nigam
Monitoring of plantations	Plantations locations	Nos. of tree survived	monthly	O&M Contractor/Nagar Nigam	O&M Contractor/Nagar Nigam
Sewer network to sustain operational efficiency and	Sewer network	to be included in the O&M plan prepared under the project	as per O&M plan	O&M Contractor/Nagar Nigam	O&M Contractor/Nagar Nigam

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
avoid clogging and early occurrence of leakages					
Consent to operate (CTO) from RSPCB	STPs	CTO should be renewed before expired	5 yearly	Bharatpur Nagar Nigam/PHED	Bharatpur Nagar Nigam, 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 Nigam	O&M Contractor/Nagar Nigam
Sludge Reuse and safe disposal	Sludge Management	Sludge is being gainfully used	Continuously	O&M Contractor/Nagar Nigam	O&M Contractor/Nagar Nigam
Monitoring of quality of water supplied to consumers	Consumer end-random sampling in all zones	As per CPHEEO norms (refer Appendix 18)	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	Pipeline networks	As per RUDSICO-EAP norms	Daily/when required	O&M Contractor	DBO contractor Cost

B. Institutional Requirements

258. 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.

259. 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.

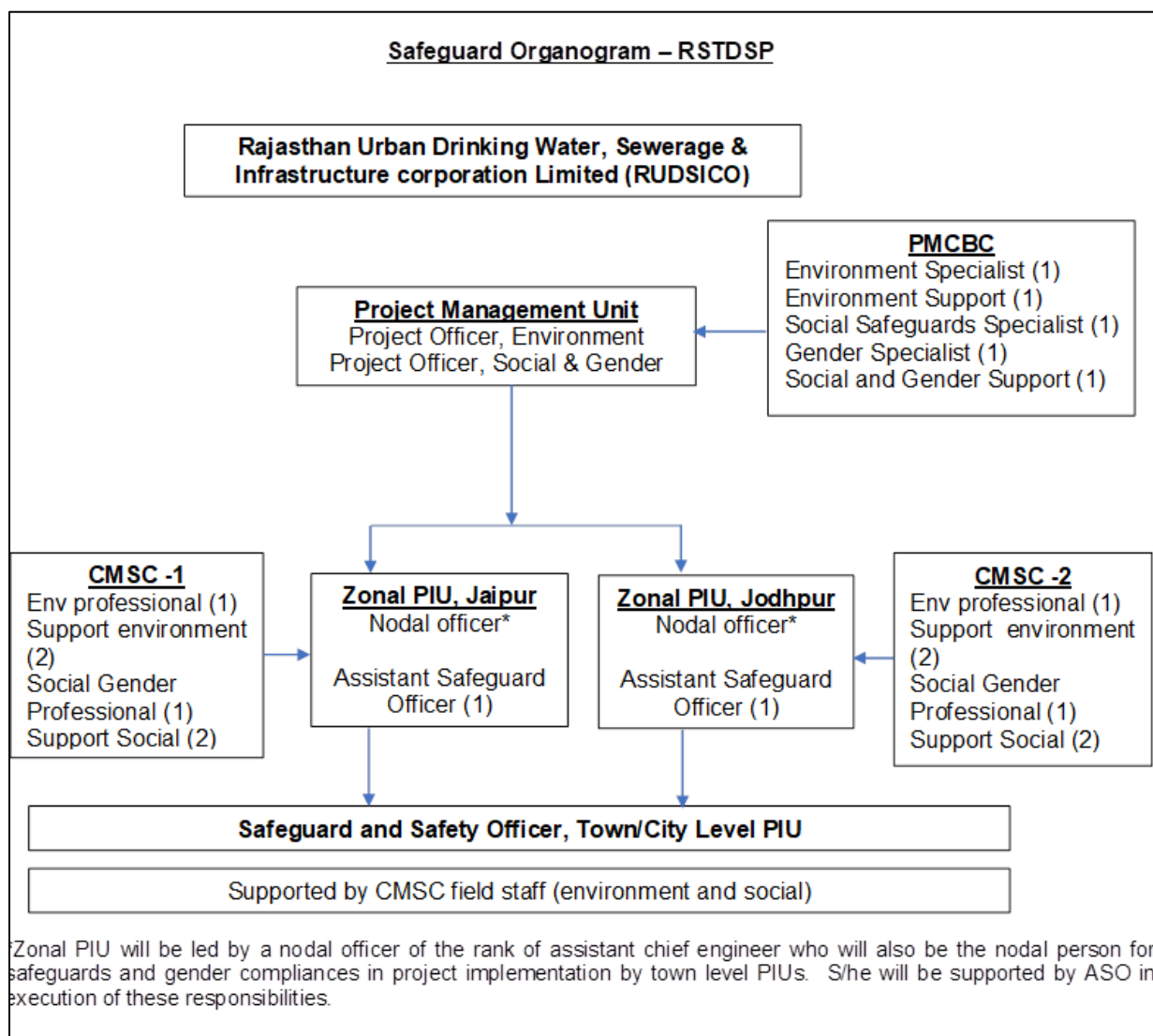
260. The PMU is being supported by the Project Management and Capacity Building Consultants (PMCBC). The PMCBC shall manage preparation/vetting design documents, tendering of contracts, implementation of resettlement, environmental management and gender action plans; setting and managing project performance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

261. 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.

262. **Construction management and supervision consultants (CMSCs)** - 2 nos. of CMSCs catering to Jaipur and Jodhpur units are already established. They shall directly support PIUs in day to day contract management, construction supervision including quality management of ongoing works etc. This shall include work measurement, quantities, verification of bills of contractors etc. In compliance with the EMP, the CMSC 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 CMSCs 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.

263. **Community awareness and public participation consultants (CAPPC)**- CAPPC core unit is already established at PMU, Jaipur and at fields in ongoing 14 project towns. CAPPC field team will be established in upcoming project towns after PIUs are formed in new towns. CAPPC 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.

264. **Figure 14** shows Environmental Safeguards Implementation Arrangements within RUDSICO-EAP and **Table 24** and **25** summarize the institutional responsibility of environmental safeguards implementation at all stages of the project.

Figure 15: Environmental Safeguards Implementation Arrangement

265. **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 24**.

266. 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.

267. **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.

268. 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 24**.

269. **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 24**.

270. **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,²⁴ consultations with interested/affected people, (iv) field-level grievance redress; and (iv) reporting.

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

272. 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.

²⁴ 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.

273. 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 25: 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. (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	(i) Over-all environmental safeguards compliance of the project (ii) Monitor and ensure compliance of EMPs as well as any other environmental provisions and conditions. (iii) Review monthly monitoring report (iv) Prepare and submit to ADB semi-annual monitoring reports (v) If necessary, prepare Corrective Action Plan and ensure implementation of corrective actions to ensure no environmental impacts; (vi) Review and submit Corrective Action Plans to ADB (vii) Organize capacity building programs on environmental safeguards (vii) Coordinate with national and state level government agencies (viii) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs (ix) Coordinate PIUs, consultants and contractors on mitigation measures involving the community and affected persons and ensure that environmental concerns and suggestions are incorporated and implemented	Compliance monitoring to review the environmental performance of project component, if required and as specified in EMP

Responsible Agency	Responsibility		
	Pre-Construction Stage	Construction Stage	Post-Construction
	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.		
PIU, Safeguard and Safety Officer (SSO)	(i) Ensure IEE is included in bid documents and contract agreements. Ensure cost of EMP implementation is provided. (iv) Disclose of approved EIAs/IEEs. (v) Obtain all necessary clearances, permits, consents, NOCs, etc. Ensure compliance to the provisions and conditions. (vi) EMP implementation regarding sites for disposal of wastes, camps, storage areas, quarry sites, etc. (vii) Organize an induction course for the training of contractors, preparing them on EMP implementation, environmental monitoring requirements related to mitigation measures, and on taking immediate action to remedy unexpected adverse impacts or ineffective	(i) oversee day-to-day implementation of EMPs by contractors, including compliance with all government rules and regulations. (ii) take necessary action for obtaining rights of way; (iii) oversee implementation of EMPs, including environmental monitoring by contractors; (iv) take corrective actions when necessary to ensure no environmental impacts; (v) submit monthly environmental monitoring reports to PMU, (vi) conduct continuous public consultation and awareness; (vii) address any grievances brought about through the grievance redress mechanism in a timely manner as per the IEEs; and	(i) Conducting environmental monitoring, as specified in the EMP. (ii) Issuance of clearance for contractor's post-construction activities as specified in the EMP.

Responsible Agency	Responsibility		
	Pre-Construction Stage	Construction Stage	Post-Construction
	mitigation measures found during the course of implementation.		
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 Ensure EMP implementation cost is included in the methodology. (iii) Undergo EMP implementation orientation by ESS of supervision consultant prior to start of works	(i) Implement EMP. (ii) Implement corrective actions if necessary. (iii) Prepare and submit monitoring reports including pictures to PIU (iv) Comply with all applicable legislation, is conversant with the requirements of the EMP; (v) Brief his staff, employees, and laborer about the requirements of the EMP and provide environmental awareness training to staff, employees, and laborers;	(i) Ensure EMP post-construction requirements are satisfactorily complied (ii) Request certification from PIU

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

C. Capacity Building and Development

274. 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.

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

276. 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 26**.

Table 26: Capacity Building Program on EMP Implementation

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

D. Monitoring and Reporting

277. 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.

278. 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.

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

280. 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 13**). Once concurrence from the ADB is received the report will be disclosed in the Project website.

281. 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 13**. 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.

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

E. EMP Implementation Cost

283. 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 27**).

Table 27: 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 hectare	0.15	137200	20580	Civil works cost
	Subtotal (A)					20580	
B.	Monitoring Measures						
1	Air quality monitoring**	Pre-construction and Construction (quarterly)	per sample	45	4920	2,21,400	Civil works cost
2	Noise levels monitoring**	Pre-construction and Construction (quarterly)	Per sample	45	1980	89,100	Civil works cost
3	Groundwater quality**	Pre-construction and Construction (quarterly)	per sample	45 + 6=51	6720	3,42,720	Civil works cost
4.	Soil quality**	Pre-construction and Construction (quarterly)	per sample	45	5880	2,64,600	Civil works cost
	Subtotal (B)					09,17,820	
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	438819	438819	Civil works cost
3						9,93,819	
4	Barricading						
	Providing and fixing Barricading using 40 mm dia M.S. pipe vertical	Construction	m	162637	50	8131850	Civil works cost

	Particulars	Stages	Unit	Total Number	Rate (INR)	Cost (INR)	Costs Covered By
	and horizontal posts						
	Providing and fixing using 40 mm dia M.S. pipe ("B" class) as vertical post and PVC tape	Construction	m	159277	38.50	6132164	Civil works cost
	MS Pipe with nut and bolt and GI corrugated sheets	Construction	Sq.m.	775	101	78275	Civil works cost
	Sub Total (D)					1,43,42,289	
E	Grievance Redressal Mechanism				Lump sum	350,000	Civil works cost
	Sub Total (F)					350,000	
	Total (A+B+C+D+E+F)				INR	16949508	

*. Tree cutting requirement for pipe line works can be decided only after confirmatory survey of full length of alignment by contractor. In this stage higher side of tree cutting numbers are taken as 15 trees. As per RUDSICO-EAP policy; compensatory plantation in the ratio of 1:3 is to be followed during construction works.

Summary of EMP Cost incurred by Institution:

Contractor Cost - INR 169,49,508 /-

PMU Cost - INR 275,000/-

Total - INR 1, 72, 24,508/-

(In Words: Rupees One Crores seventy-two lacs twenty-four thousand and five hundreds eight only)

Table 28: 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 (three quarters leaving quarter of monsoon)	Project duration	Total number of environmental monitoring required during project duration
STPs-1 SPS-3 Sewer networks 1 Total-5 Locations	Air- 5 Noise- 5 Ground Water- 5 Soil- 5	Air- 15 Noise- 15 Ground Water- 15 +2 Surface water in one year Soil- 15	3 years	Air- 45 Noise- 45 Ground Water- 45 + 6 (Surface Water) Soil- 45

X. CONCLUSION AND RECOMMENDATION

284. The process described in this document has assessed the environmental impacts of all elements of the Bharatpur sewerage subproject. All potential impacts were identified in relation to pre-construction, construction, and operation phases. Planning principles and design considerations have been reviewed and incorporated into the site planning and design process

wherever possible; thus, environmental impacts as being due to the project design or location were not significant. During the construction phase, impacts mainly arise from the construction dust and noise, the need to dispose of large quantities of waste soil and import a similar amount of sand to support the sewer in the trenches; and from the disturbance of residents, businesses, traffic and important buildings by the construction work. The social impacts (access disruptions) due to construction activities are unavoidable, as the residential and commercial establishments exist along the roads where sewers will be laid. A resettlement plan has been developed in accordance with ADB SPS 2009 and Government of India laws and regulations.

285. Most of the Bharatpur town is already covered by sewerage network. There is existing STP of 8.0 & 5.0 MLD capacity based on SBR technology at Bharatpur Town. Capacity of These STPs is not sufficient to meet the sewer load of town and therefore these STPs are overloaded and proper treatment of sewer is not being done. Sewerage received from various parts of town is disposed untreated in open lands and low lined areas at several places.

286. The subproject is formulated to address gaps in water and sewerage infrastructure in a holistic and integrated manner. The Project Components include improvements in sewerage infrastructure. Whole the sewage generated from municipal limits shall also be treated at STPs as per latest effluent norms.

287. Proposed sites of STPs are located away from habitation areas. However, there are only shrubs and 2-3 trees at these locations 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.

288. 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.

289. 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.

290. 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.

291. 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.

292. 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.

293. The Environmental Management Plan proposed in the project includes mitigation measures for identified impacts, training and capacity building activities, a monitoring plan to ensure that the environmental standards are maintained throughout the project construction period and a reporting plan to ensure that the project is implemented as per environmentally sound engineering and construction practices. The budgetary provision for mitigating the anticipated impacts by proposed subproject component is made in the project for effective implementation of the EMP Plan.

294. 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.

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

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

297. **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) Include this IEE in bid and contract documents;
- (iii) Update/revise this IEE based on detailed design and/or if there are unanticipated impacts, change in scope, alignment, or location;
- (iv) Commitment from PMU, PIUs, project consultants, and contractors to protect the environment and the people from any impact during project implementation
- (v) Update and implement the asbestos management plan per site-specific conditions;
- (vi) Conduct safeguards induction to the contractor upon award of contract;
- (vii) Ensure that sludge management protocols are compliant with environmental regulations (Solid Waste Management Rules 2016 and its amendments) and solid waste disposal should have a designated site (dumping on vacant lot is not allowed);

- (viii) Ensure the Construction and Demolish waste management -2016 protocols for disposal of construction waste.
- (ix) Ensure contractor appointed qualified environment, health and safety (EHS) officers prior to start of works;
- (x) Timely disclosure of information and establishment of GRM;
- (xi) Involvement of contractors, including subcontractors, in first level GRM;
- (xii) Strictly supervise EMP implementation;
- (xiii) Continuous consultations with stakeholders;
- (xiv) Documentation and reporting on a regular basis as indicated in the IEE.

Appendix 1: REA Checklist

Instructions:

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

Country/Project Title: India/Rajasthan Secondary Towns Development Investment Program (RSTDP)/Bharatpur Wastewater Sub Project, Distt. Bharatpur, 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?	√		Bharatpur 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 is Keoladeo national park but project components are out of Eco-sensitive zone of national park.
Cultural heritage site	√		There are various cultural heritage site in Bharatpur but no one is falls under project construction area.
Protected Area	√		There is Keoladeo national park but project components are out of Eco-sensitive zone of national park.
Wetland	√		Keoladeo national park is Ramsar Wetland Site but none of the component are proposed near the Ramsar site.
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?	√		There are various cultural heritage site in Bharatpur but no one is falls under project construction area.

SCREENING QUESTIONS	Yes	No	REMARKS
Interference with other utilities and blocking of access to buildings; nuisance to neighbouring 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 odour, 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?		√	There is no any surface water source in Bharatpur. 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 neighbouring 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
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.

SCREENING QUESTIONS	Yes	No	REMARKS
Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances, and protect facilities?		√	STP is located in remote areas away from habitation. ULB will make provision of buffer zone of 250 m for both STPs (Existing and Proposed STP unit).
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. 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?		√	The rainfall over Bharatpur is scanty and is concentrated over four month i.e. from June to September. The rains are erratic and so is the distribution of the rainfall.
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?		√	There is no surface water body in Bharatpur, No untreated/partially treated sewage will be disposed. 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.

SCREENING QUESTIONS	Yes	No	REMARKS
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)?		Ö	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?		Ö	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?	Ö		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

Checklist for Preliminary Climate Risk Screening

Country/Project Title: India/Rajasthan Secondary Towns Development Investment Program (RSTDP), Bharatpur sewerage Project, District Bharatpur, Rajasthan

Sector: Urban Development

Subsector: Sewerage

Division/Department: SARD/SAUW

Screening Questions		Score	Remarks ²⁵
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

²⁵ 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.

	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

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 new STP and pump houses along with 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: Public Consultation and Stakeholders Consultations Conducted During Project Preparation

A. Stakeholder consultation

- a. **City level Level Committee (CLC) Meeting (dtd. 27.07.2021)**- City Level Committee meeting was organized for Bharatpur sewerage in District Head Quarter, Bharatpur on dtd. 27.07.2021 to discuss the matter of proposed Sewerage works in Bharatpur under the chairmanship of District Collector, Bharatpur, in presence of, DPR consultants, RUDSICO-EAP officials, POHED officials, Municipal Council officials, UIT officials, PWD and other invitee members. Proposed scope of works and technology was discussed in the meeting and it was decided that treated effluent shall be reused by Municipality in beneficial uses. Minutes of CLC meeting, attendance sheet and photographs are given below-

City Level Committee Minutes of Meeting held on 24.07.2021

कार्यालय अधिशाषी अभियन्ता आर.यू.आई.डी.पी. सवाई माधोपुर (राज0)

क्रमांक:- 594

दिनांक:- 27.07.2021

बैठक कार्यवाही विवरण

अधिशाषी अभियन्ता एवं सदस्य सचिव आर.यू.आई.डी.पी. सवाईमाधोपुर के पत्रांक 541 दिनांक 19.07.2021 की अनुपालना में दिनांक 24.07.2021 समय दोपहर 12.00 बजे श्रीमान जिला कलक्टर महोदय की अध्यक्षता में भरतपुर शहर का सीवरेज कार्य आर.यू.आई.डी.पी. की एशियन विकास बैंक की वित्त पोषित योजना चतुर्थ चरण के अन्तर्गत प्रस्तावित योजना की क्रियान्विती के सम्बन्ध में सिटी लेवल कमेटी की बैठक आयोजित की गई। जिसमें निम्नलिखित सदस्यों ने भाग लिया। सूची संलग्न है।

भरतपुर शहर के कुछ भाग में सीवरेज नेटवर्क डालने का कार्य:- भरतपुर शहर के लिए एशियन विकास बैंक की वित्त पोषित योजना चतुर्थ चरण के अन्तर्गत प्रस्तावित योजना में सीवर लाईन डालने के लिये 125.02 करोड़ रुपये का प्रावधान रखा गया। जिसकी डी.पी.आर. बनाने के लिये नगर निगम भरतपुर द्वारा ग्रीन सिटी सर्वेयर, जयपुर को कार्य सौंपा गया। सलाहकार द्वारा भरतपुर शहर के निम्नलिखित कॉलोनियों में सीवर लाईन डालने के प्रस्ताव बनाये गये।

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| 1. रणजीत नगर | 2. मुखर्जी नगर |
| 3. सेक्टर नं० 3 | 4. ट्रान्सपोर्ट नगर |
| 5. अग्रसेन नगर | 6. हरिजन कच्ची बस्ती |
| 7. नई मण्डी | 8. रेल्वे स्टेशन के सामने का क्षेत्र |
| 9. लुहार बस्ती | |
| 10. प्रिंस नगर | 11. गिराज नगर |
| 12. बजरंग नगर | |
| 13. रेल्वे कॉलोनी | 14. गांधी नगर |
| 15. शिव नगर कॉलोनी फैंज प्रथम | |
| 16. राम नगर (ईदगाह कॉलोनी) | 17. रूधिया नगर |
| 18. नई मण्डी | |
| 19. बजरिया | 20. गोकुल नगर |
| 21. पीएनटी क्वार्टर्स | 22. यूआईटी स्कीम |

आर.यू.आई.डी.पी. द्वारा पूर्व में कराये गये सीवर लाईन से वंचित निम्नलिखित कॉलोनियों के शेष भाग को भी इस कार्य में सम्मिलित किया गया है। जो निम्नानुसार है:-

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| 1. बजरंग विहार कॉलोनी | 2. नीम दरवाजा कॉलोनी |
| 3. नदिया मौहल्ला | 4. बासन गेट |
| 5. सूरजपोल चौराह (नियर गुलाल कुण्ड) | 6. नमक कटरा (नियर दाऊदयाल पार्श्व) |
| 7. सहयोग नगर | 8. नमक कटरा (मैन पोस्ट ऑफिस के पीछे) |
| 9. नमक कटरा (नियर चोंदपोल गेट) | 10. पटपरा मौहल्ला (कोली बस्ती) |
| 11. पुराना डाक खाना (नियर कोतवाली) | 12. गोपालगढ़ (हरी सिंह नेता के आगे) |
| 13. लक्ष्मण मन्दिर (गुड की मंडी) | 14. बड़ा मौहल्ला (मौसी किन्नर पार्श्व) |
| 15. नमक कटरा (पार्श्व रैनू गोरावर) | 16. मोरी चार बाग |
| 17. बी-नारायण गेट के पास (कोली बस्ती) | 18. अनाह गेट बजरिया (मंगी गली) |
| 19. लवानिया मौहल्ला (नियर लक्ष्मण मन्दिर सर्किल) | |

20. नवीन सिटी एवं उपरोक्त कॉलोनियों के आस-पास का क्षेत्र।

बैठक में माननीय मंत्री महोदय चिकित्सा एवं स्वास्थ्य, तकनीकी शिक्षा जो कि वर्तमान में भरतपुर शहर के विधायक हैं। उनके द्वारा इस सम्बन्ध में विस्तृत चर्चा की गई।

माननीय मंत्री महोदय द्वारा सर्वप्रथम भरतपुर शहर में आर.यू.आई.डी.पी. द्वारा डाले गये सीवर नेटवर्क की जानकारी ली गई। बैठक में उपस्थित अधिशाषी अभियन्ता आर.यू.आई.डी.पी. द्वारा बताया गया कि उपरोक्त कार्य आर.यू.आई.डी.पी. के द्वितीय चरण के अन्तर्गत वर्ष 2010 से 2019 के बीच में करवाया गया। जिसके तहत भरतपुर शहर की सरकूलर रोड़ के अन्दर की विभिन्न कॉलोनियों में लगभग 74 किलोमीटर सीवर लाईन डाली गई एवं सीवर लाईन को चालू करके नगर निगम भरतपुर को दिसम्बर 2019 में हस्तांतरित कर दिया गया। मंत्री महोदय द्वारा दिनांक 21.06.2021 को आयोजित की गई सिटी लेवल कमिटी की मीटिंग में जो कमियाँ बताई गई थी उनके निवारण के सम्बन्ध में जानकारी ली गई बैठक में उपस्थित अधिशाषी अभियन्ता आर.यू.आई.डी.पी. द्वारा बताया गया कि उन कमियों को देखते हुये डीपीआर में सुधार कर दिया गया है। जिसकी नगर निगम, भरतपुर के अधिकारियों द्वारा सहमति जताई गई। मंत्री महोदय द्वारा बैठक में निम्न निर्देश प्रदान किये गये।

1. मंत्री महोदय ने निर्देश दिये कि नया सीवर कार्य जिस एजेन्सी को आवंटित किया जाये। उसके संवेदक से कार्य 18 महीने में पूरा कराया जावे एवं यदि संवेदक द्वारा कार्य में देरी होती है तो इसके लिये संवेदक को पैनल्टी लगायी जाये। तथा समयावधि में यदि संवेदक द्वारा कार्य पूर्ण किया जाता है तो यथाउचित प्रोत्साहन राशि दी जाये।
2. डीपीआर में सी.सी. 4 मीटर चौड़ाई तक एवं बीटी में 7 मीटर चौड़ाई तक सीवर लाईन डालने के पश्चात् पूरी चौड़ाई में रोड रेस्टोरेशन कार्य लिया गया है। उस पर सहमति बताई। अधिशाषी अभियन्ता, आर.यू.आई.डी.पी. द्वारा बताया गया कि 4 मीटर सी.सी. चौड़ाई से अधिक एवं 7 मीटर से अधिक चौड़ाई की बीटी में कार्य किया जाता है तो उसका रोड रेस्टोरेशन केवल ट्रेन्च में ही किया जायेगा। इस पर सिटी लेवल के चैयरमैन श्रीमान जिला कलक्टर महोदय, भरतपुर द्वारा निर्देश दिये गये कि उपरोक्त रोड रेस्टोरेशन पूरी चौड़ाई में किया जाये। जिसके लिये आवश्यक अतिरिक्त राशि का प्रावधान डीपीआर में रखा जावे।
3. डीपीआर में हाउस सीवर कनेक्शन कार्य के लिये प्रति कनेक्शन जो राशि डीपीआर में दर्शायी गई है जो अधिक प्रतीत होती है। उसका पनुः नये सिरे से आकलन किया जावे।
4. परियोजना के कार्य को निर्धारित समयावधि में पूर्ण करने के लिये उसके माइलस्टोन निर्धारित किये जाये एवं कार्य की गुणवत्ता को सुनिश्चित करने के लिये प्रभावी कदम उठये जाये।
5. बैठक में उपस्थित अधीक्षण अभियन्ता जन0 स्वा0 अभियांत्रिकी विभाग, वृत्त भरतपुर के द्वारा अवगत कराया गया कि सीवर लाईन डालने के समय उनके उपभोक्ताओं के नल कनेक्शन एवं विभागीय पाईप लाईन क्षतिग्रस्त हो जाती है। जिसके कारण उपभोक्ताओं को पेयजल समस्या का सामना करना पड़ता है। इसके निवारण के लिये मंत्री महोदय द्वारा आर.यू.आई.डी.पी. एवं नगर निगम के अधिकारियों को निर्देश प्रदान किये गये कि प्रस्तावित सीवर नेटवर्क की ड्राइंग जन0 स्वा0 अभियांत्रिकी विभाग को भी उपलब्ध करावे। एवं जन0 स्वा0 अभियांत्रिकी विभाग मौके पर निरीक्षण करके सीवर नेटवर्क कार्य के अन्तर्गत आने वाली पेयजल पाईप लाईनों की सर्वे करके उनको सीवर नेटवर्क अलाइनमेंट से हटाने के लिये तकमीना बनाकर कार्यकारी एजेन्सी को कार्य प्रारम्भ से पूर्व उपलब्ध करावे। जिससे कि आवश्यक राशि जन0 स्वा0 अभियांत्रिकी विभाग में जमा करायी जाकर, कार्य पूर्ण कराया जा सके।

6. मंत्री महोदय द्वारा भरतपुर शहर में चल रहे हाउस सीवर कनेक्शन कार्य की समीक्षा की गई जिसमें नगर निगम के अधिकारियों द्वारा अवगत कराया गया कि आरयूआईडीपी नेटवर्क के 13742 हाउस सीवर कनेक्शन के लक्ष्य के विरुद्ध 5000 कनेक्शन एवं अमृत योजना के 16185 के विरुद्ध 1600 पूर्ण किये जा चुके हैं एवं शेष कार्य प्रगति पर है। इस पर मंत्री महोदय द्वारा नाराजगी व्यक्त की गई तथा हाउस सीवर कनेक्शन के लक्ष्य को तुरन्त प्रभाव से पूर्ण करने के निर्देश दिये गये।

अन्त में मंत्री महोदय द्वारा डीपीआर में उपरोक्त निर्देशों को सम्मिलित करने के निर्देश दिये गये तत्पश्चात् सीएलसी के सदस्यों द्वारा उसका सर्वसम्मति से अनुमोदन किया गया तथा आरयूआईडीपी को उपरोक्त कार्य की शीघ्र निविदा आमंत्रित करने के निर्देश दिये गये।

बैठक सधन्यवाद समाप्त हुई

संलग्न:-उपरोक्तानुसार

क्रमांक:- 595-610

प्रतिलिपि:-

1. निजी सहायक परियोजना निदेशक, आरयूआईडीपी, जयपुर।
2. निजी सहायक जिला कलक्टर महोदय भरतपुर।
3. निजी सहायक सांसद महोदय लोकसभा क्षेत्र, भरतपुर।
4. निजी सहायक विधायक महोदय विधानसभा क्षेत्र, भरतपुर।
5. निजी सहायक महापौर महोदय नगर निगम, भरतपुर।
6. निजी सहायक उप महापौर महोदय नगर निगम, भरतपुर।
7. श्रीमान अध्यक्ष/सचिव नगर विकास न्यास, भरतपुर।
8. अति० मुख्य अभियन्ता पी.एच.ई.डी.।
9. अति० मुख्य अभियन्ता पी.डब्ल्यू.डी.।
10. अति० मुख्य अभियन्ता, आरयूआईडीपी जोन, जयपुर।
11. आयुक्त नगर निगम, भरतपुर।
12. अधिशाषी अभियन्ता, नगर निगम, भरतपुर।
13. अधिशाषी अभियन्ता, नगर विकास न्यास, भरतपुर।
14. उप नगर नियोजक भरतपुर।
15. मुख्य कार्यकारी अधिकारी ल्यूपिन भरतपुर।
16. मैसर्स ग्रीन सिटी सर्वेयर, जयपुर।

27/7/21

अधिशाषी अभियन्ता एवं

सदस्य सचिव

आर.यू.आई.डी.पी. सवाई माधोपुर

दिनांक:- 27.07.2021

27/7/21

अधिशाषी अभियन्ता एवं

सदस्य सचिव

आर.यू.आई.डी.पी. सवाई माधोपुर

b. Town-level Stakeholders Consultation Meeting, dated 11.10.2022

An stakeholder consultation/workshop was organised in Meeting Hall of Municipal Corporation, Bharatpur on 11.10.2022 preceded by the Minister for Technical Education and Ayurveda, Government of Rajasthan. Meeting was attended by stakeholders as well as public figures. District Collector, Bharatpur, Various Government Department representatives including PHED, Archaeological Survey of India (ASI), Department of Archaeology and Museum, GoR, PHED, PWD, UIT, Municipal Corporation Engineers, Town Planners, Representative engineer of Local self Government department of GoR. TA-Team of ADB with its members interacted on various aspects, sewerage and avenues of tourism development in Bharatpur, City beautification including conservation of its build and natural heritage was discussed in view of long term planning. The meeting got wide coverage in mainstream media and a paper cutting of the workshop is depicted below (Rajasthan Patrika, dated 12.10.2022)

‘प्राचीन स्थलों के साथ प्राकृतिक स्थलों को भी करना होगा संरक्षित...’

पत्रिका न्यूज़ नेटवर्क
rajasthanpatrika.com

भारतपुर. एशियन डेवलपमेंट बैंक की टीम की ओर से मंगलवार को कलक्ट्रेट सभागार में भारतपुर में पर्यटन विकास की संभावनाओं पर कार्यशाला की। इसकी अध्यक्षता तकनीकी शिक्षा एवं आयुर्वेद राज्य मंत्री डॉ. सुभाष गर्ग ने की।

कार्यशाला में बैंक के प्रतिनिधियों ने बताया कि राज्य के भारतपुर, नवलगढ़ एवं जोधपुर में पर्यटन को बढ़ावा देने के लिए इस प्रकार की कार्यशाला की जा रही है। कार्यशाला में बताया गया कि कोरिया, वियतनाम एवं सिंगापुर में स्थानीय संसाधनों का उपयोग कर पर्यटन को बढ़ावा दिया। इसकी



को परिचित कराने के लिए कार्यक्रम आयोजित करने होंगे। ताकि पर्यटन को बढ़ावा मिले और पर्यटक अधिक समय तक ठहर सकें।

कार्यशाला में बताया गया कि साउथ कोरिया में पर्यटन कई गुना बढ़ गया है क्योंकि वहां की सरकार ने पर्यटन के विकास के लिए सभी संसाधनों का उपयोग किया। कार्यशाला में यह भी बताया गया कि प्राचीन धरोहरों के साथ साथ प्राकृतिक स्थलों को भी संरक्षित करना होगा। क्योंकि अधिकांश पर्यटक प्राकृतिक स्थलों के संबंध में अधिक रुचि रखते हैं। कार्यशाला में साउथ कोरिया के खान ए ने बताया कि साउथ कोरिया में ऐतिहासिक स्थलों के साथ सरकार ने प्राकृतिक

स्थलों को भी विकसित किया है। यही कारण है कि आज कोरिया की आय पर्यटन व्यवसाय से कई गुना बढ़ गई है।

कार्यशाला की अध्यक्षता करते हुए तकनीकी शिक्षा राज्यमंत्री ने कहा कि भारतपुर की विरासत काफी समृद्ध है। जिसे सहेजने की आवश्यकता है। पर्यटन के स्थलों के विकास के लिए सभी विभागों को मिलकर प्रयास करना होगा और लोगों में इनके संरक्षण के प्रति जागृति लानी होगी। नगर निगम के मेयर अभिजीत कुमार ने बताया कि शहर में गंदे पानी की निकासी के लिए ड्रेनेज परियोजना प्रारंभ की गई है और 36.2 करोड़ रुपए की लागत से सीवरेज का कार्य प्रगति पर है।

वजह से इन देशों की आय में काफी बढ़ावा मिला है। कार्यशाला में बताया गया कि वर्तमान में जो देशों से उपयोग करना होगा तथा इजाफा हुआ है। कार्यशाला में संसाधन उपलब्ध हैं उनका बेहतर विरासत के साथ स्थानीय संस्कृति

Following participated in the Workshop and Consultation

S.No.	Name	Designation and Department
1.	Dr. Subhash Garg	Minister , Technical Education and Ayurveda, Government of Rajasthan
2.	Alok Ranjan	District Collector , Bharatpur District
3.	Abhijit Kumar	Mayor , Municipal Corporation , Bharatpur
4.	Nawon Kim	Team Leader , ADB
5.	Bhawesh Kumar	Sr. Project Officer , ADB
6.	Kapil Gupta	Superintending Engineer , RUIDP, Jaipur
7.	N.C. Panwar	Superintending Engineer , RUIDP, Jaipur
8.	Arvindo Vijay	Superintending Engineer , PHED, GoR.
9.	Vinod K Chauhan	Superintending Engineer , Municipal Corporation, Bharatpur
10.	Mudasar Ali	CA, Archeological Survey of India (ASI).
11.	Neraj Tripathi	Superintendent, Department of Archeology and Museum, GoR.
12.	Manoharlal Meena	DTP, Town Planning, GOR
13.	K.K. Khandelwal	Senior Town Planner, GoR.
14.	O.P. Kirab	Executive Engineer , PWD, GoR.
15.	D.P. Sharma	Executive Engineer , UIT
16.	Ashok Agarwal	Executive Engineer , PHED, GoR.

17.	Sanjay Kumar Singh	Executive Engineer , PHED, GoR.
18.	K.K. Khandalwal	AC , Devsthanam, GoR.
19.	Pradeep K. Jha	Team Leader , CMSC, RSTDSP, Jaipur
20.	Manas Sharma	Heritage Expert , PMCBC, RSTDSP, Jaipur
21.	Sanjay Grover	PPP Specialist , ADB
22.	Patrik R.	ADB
23.	Sanjay Saxena	Team Leader , TA Team
24.	Urvashi Srivastava	Heritage Expert , TSCPL
25.	Suresh Gupta	TA-Consultant , ADB, TA
26.	Nirdy mangal	TA-Consultant , ADB, TA
27.	Umar Khan	TA-Consultant , ADB, TA
28.	Stephen C.	TA-Consultant , ADB, TA
29.	Srilatha G.	TA-Consultant , ADB, TA
30.	Nomaen Akhtar	TA-Consultant , ADB, TA
31.	KOU SEAM MUM	TA-Consultant , ADB, TA
32.	HONG, NAHI	TA-Consultant , ADB, TA
33.	SEO HAN LIM	TA-Consultant , ADB, TA
34.	Deepa Kumari	Assistant Engineer , MCB
35.	Meena	Assistant Engineer , MCB
36.	Kodi Venkatesan	Chief Manager , BESL
37.	Aakash Saxena	COO , BESL
38.	Shatyabhanu	Director , Dhara Consultants
39.	Devendra Singh	Assistant Engineer , Water Resources Department, GoR.
40.	Radheshyam Gurjar	Assistant Engineer , Municipal Corporation, Bharatpur.
41.	Lokendra Jain	Assistant Engineer , Local Self Governance , GoR.
42.	Vicky Projapat	Project Manager , Green city Surveyors, Pvt. Ltd.

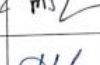
Attendance Sheet –Meeting Hall, Collectorate, Bharatpur (11.10.2022)

S.No	Name	Designation	Department	E-mail	Mobile	Signature
1	Alok Ranjan	District Collector				
2	Dr Subhash Garg	NIL-A				
3	Manoj Kumar	Mayor				
4						
5						
6						
7	Nawon Kim	Team leader	ADB	nawonkim@adb.org	+63999999/523	
8	Bhavesh Kumar	Sr. Project Officer (Urban)	ADB	bkumar@adb.org	+91 8800729004	
9	Sanjay Grover	Sr. PPP Specialist	ADB	sgrover@adb.org	+91 9999999999	
10	Patrick Rene	Director's Advisor	ADB	prene@adb.org	+63 999 999 9999	

S.No	Name	Designation	Department	E-mail	Mobile	Signature
11	SANJAY SAXENA	TEAM LEADER TA TEAM	ADB TA	sanjay@tscpl.com	9811083474	
12	URVASHI SRIVASTAVA	HERITAGE EXPERT TSCPL	ADB TA	SREURASHI@YAHOO.COM	9871973126	
13	Suzesh Gupta	TA consultant	ADB TA		9419652063	
14	Umar Khan	TA - Infrastructure Consultant	ADB TA	umar.jk@yahoo.com	8527605222	
15	Stephen Cairns	TA consultant	FCL/ETHZ	cairns@arch.ethz.ch	96340467	
16	Srilakshmi G.	TA-consultant	FCL/ETHZ	srilakshmi.gopalakrishnan@sec.ethz.ch		
17	Niralya Mangal	TA-consultant	FCL/ETHZ	niralya.mangal@sec.ethz.ch		
18	Nomaan Aichat	TA-consultant	ADB TA	nomaan@tscpl.com	9128558087	
19	KOU, SEAN BUM	TA-Consultant	Hon-A	zedikoh@hon-a.co.kr	+82 10 9721 143	
20	HONG, NA HUI	TA-consultant	Hon-A	nmhong@hon-a.co.kr	+82 10 2652 224	

S.No	Name	Designation	Department	E-mail	Mobile	Signature
31	KAPIL GUPTA	SE	RUIDP, Saini	Rahul73gupta@gmail.com	9414262943	
32	M. C. Panwar	SE	RUIDP Punam	k.panwarnc@gmail.com	8618613731	
33	Neeraj Tripathi	Superintendent Bharatpur Division	Archaeology Dept.	Supam.Bharatpur@gmail.com	9887722199	
34	Dr. ARVIND VIJAY	SE,	PHED	arvindvijay@gmail.com	9414924112	
35	Vinod K. Chauhan	SE	MCB	Vinodchauhan75@gmail.com	9414305815	
36	O. P. KIRAD	GF	PWD	opkhaa1571@gmail.com	9414014868	
37	Satyabhany Angirash	Director	Dhara Gg Consultants Pvt Ltd	dharaassociates@gmail.com	7727096633	
38	D. P. Sharma	EE	UIT	vitbramta@gmail.com	8209995497	
39	vicky propapat.	P.M	Green City Surveys Pvt. Ltd	green consultants Jodhpur@gmail.com	7742420043 9314165000	
40	Ashuk Agarwal	EEA TA+SE	PHED	akagrawal.003@gmail.com	5414930207	

S.No	Name	Designation	Department	E-mail	Mobile	Signature
21	SEO. HAN LIM	TA - consultant	HAN-A	Alseo@han-a.co.kr	+82 10 1523 5548	
22	moham Lal meena	DTP	Team Planning		9460618641	
23	Ravi Rai verma	STP (Project)	Team Planning	raviraiverma@yahoo.com	8761175692	
24	K.K. Khondelwal	Ac Devasthan	Devasthan		8094935980	
25	Deepen Kumari	ABN	Nagar Nigam		4737483717	
26	Meena Seema Ranbari	ABN	Nagar Nigam	meena.seema12@gmail.com	9716624825	
27	RODI. VENKATESAN	Chief Manager	BESL	rodi.venkatesan@rpsg.in	9116107313	
28	AAKASH SAXENA	COO	BESL	aakash.saxena@rpsg.in	7412060128	
29	MANAS SHARMA	HERITAGE EXPERT	PHC BC (RUIDP)	manas.sharma09@gmail.com	9828384088	
30	PRADEEP KUMAR JHA	Team Leader CMSC-01, RUIDP	CMSC-01 RUIDP	Pradeep.Kumar.jha@phdrii.com	9910188505	

S.No	Name	Designation	Department	E-mail	Mobile	Signature
41.	Sanjay Kumar Singh	XFn (CM2)	PHED Region Bharatpur		633523191	
42.	Devendra Singh	A.En (M)	WFD Bharatpur		9887529215	
43.	Kadheshyam Gursah	A.En.	Nagar Nigam Bharatpur		9079773212	
44.	Lokendra Jain	Asst	DDR (LSC) B'PUR		941444535	
45.	Muhammad Ali	CA, ASI,	ASI, Bharatpur	caah.cabhi.ash@gmail.com	9410830786	

c. Tow-level stakeholder consultation meeting dated 18 January, 2023

Stakeholder consultation was held on 18th January 2023 in the meeting hall of Nagar Nigam Bharatpur and proposed sewerage and beautification works were discussed in detail. Nigam parshad/ or ward councilors suggested that there are so many historical sites in Bharatpur and their renovation is also required. Mayor, Nagar Nigam informed that we will take up these issues with higher authorities and will request to consider under AMRUT scheme.





Stakeholder consultation-Nagar Nigam Conference hall-18.01.23



Office of The Superintending Engineer,
External Aided project (RUIDP)
Rajasthan Urban Drinking Water Sewerage and
Infrastructure Corporation Ltd. PIU-Bharatpur



Address: House No. 246 Ram Vatika Rajendra Nagar Bharatpur (Rajasthan)

E-mail - piu@ruidp.org.in

RUIDP/PMU Ph-IV/BHR/2022-23/

Date:

Town Level Consultation Bharatpur City Beautification and also Bharatpur Sanitation components with officials of Asian Development Bank (ADB) and RUIDP, Jaipur a meeting is scheduled to be held on 18 January 2023 at 03:30 PM in Nagar Nigam Meeting hall, Bharatpur

Attendance Sheet

S.N.	Name	Designation	Department	Mob. No	Signature
1	अभिनीता गुप्ता मे 24				
2	बिरीजा चौधरी 34 मे 24				
3	स.प.पंथर	SE RUIDP PEU Bharatpur	RUIDP	8619613736	
4	गिती देवी चौधरी	अ.ए. N	Nagar Nigam		
5	Deepak Kumar	Commissioner	Nagar Nigam	9414234433	
6	Shalish Panthar	—	—	9414025830	
7	गुणमती कु.पंथर	Nagar Nigam Treasurer	Nagar Nigam	9414268471	
8	Blaska Sharma	Councillor	Nagar Nigam	8335834735	
9	राजेश शिंदे मे 24	पार्षद	नगर निगम	9001528736	
10	रमेश पाठक	पार्षद	नगर निगम	9444303745	
11	वैराग मुकुंद पाठक	पार्षद	नगर निगम	6375093861	
12	मीती सिंह	पार्षद	नगर निगम	9182743073	



Office of The Superintending Engineer,
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Rajasthan Urban Drinking Water Sewerage and
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भारतपुर

Address: House No. 246 Ram Vatika Rajendra Nagar Bharatpur (Rajasthan)

Phone: 05622252121/2212212

S.N.	Name	Designation	Department	Mob. No	Signature
13	हार्दिक कुमार	जार्ज-36	नगर निगम	9660600000	[Signature]
14	रमेश चन्द	जार्ज-36	नगर निगम	8764388000	[Signature]
15	नरेश कुमार	जार्ज-36	नगर निगम	9660602446	[Signature]
16	कपिल कुमार	जार्ज-36	नगर निगम	9460740271	[Signature]
17	दीपक कुमार	जार्ज-36	नगर निगम	9461541781	[Signature]
18	दिनेश कुमार	GIS Consultant		7792919291	[Signature]
19	अनुराग कुमार	GIS Consultant		7737292009	[Signature]
20	Ayaz Ali Khan	GIS Consultant		823889626	[Signature]
21	पंकज कुमार	जार्ज-36	नगर निगम	8875424242	[Signature]
22	Mudassar Ali	AST, Bharatpur fark, map	AST	9410830706	[Signature]
23	पुष्पा शर्मा			753750776	[Signature]
24	Anju Singh	GIS	Government Bharatpur	8300403233	[Signature]
25	J. D. Singh	Social Expert	PMCB RUIDP	9602832937	[Signature]
26	MANAS SHARMA	HERITAGE EXPERT	PMCB RUIDP	9828384088	[Signature]
27	Sushant Singh	Safeguard- Specialist- Environment	PMCB RUIDP	7678358150	[Signature]



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Infrastructure Corporation Ltd. PIU-Bharatpur



Address House No. 246 Ram Vatika Rajendra Nagar Bharatpur (Rajasthan) E-mail: piu@ruidp.org.in

S.N.	S. I Name	Designation	Department	Mob. No	Signature
28	A. M. Singh	M.E. CAPRUM Jaipur	RUIDP, JPR	9314413811	17/01/23
29	Vandan Srivastava	Environmental Safeguard Professional	CSMCOG Jaipur	9410085379	Devi
30	PRADEEP K JHA	TEAM LEADER CMSC-01 RUIDP	CMSC-01 RUIDP	9910188505	D
31	Amit Kumar Verma	SO General PMU	PMU RUIDP	9412561751	
32	Gaurind Singh Kothare	Safeguard consultant Environment, ADB	ADB	956096700	gaurind
33	Roopi Ghosh	Social Safeguard Consultant, ADB	ADB		g
34	राजेश्वर सिंह (राजेश)			77421644	de
35	राजेश्वर सिंह जायसवाल			9414922525	
36	राजेश्वर सिंह	पाईट	राज निगम	7665111333	राजेश्वर
37	हेमन्त सिंह	पाईट	राज निगम	9462056987	हेमन्त
38	किशोर सिंह	पाईट	राज निगम	9413834832	किशोर
39	"मिर्मोरा"	पाईट	राज निगम	9782664710	मिर्मोरा
40	Mohammed	Manager	MTS JAIPUR	9461823211	
41	Satyabhama Anjirash	Director Dhara Eng Consultants P Ltd	Dhara Eng Consultants Pvt Ltd	7727036603	
42	Ashish Kumar Mehta	J. En.	Nagar Nigam Bharatpur	9740860222	

d. Telephonic discussion with Wildlife and Forest Department of Bharatpur

A Telephonic discussion was made with Deputy Conservator of Forest (Wildlife Division Bharatpur Phone-05644-222777) and discussed about wildlife area, wildlife moment, migratory bird routes, timing of migratory bird and wildlife and avifauna movement near the proposed site of STP and SPSs.

Out Come of Consultation: - (i) Near the proposed site no wildlife moment has been observed, (ii) In the Bharatpur District Keoladeo National Park is existed and MoEFCC has declared Eco-Sensitive Boundary (iii) In this National Park majority of protected species are mainly birds.

e. Consultation with Officials of Nagar Nigam (Civil Department) Bharatpur

Concern Person: i). Mr. Radeshyam Gujar (JEN –Nagar Nigam Bharatpur)-9079773212

ii) Mrs. Seema Meena ((AEN –Nagar Nigam Bharatpur)-9716624825

Areas of Discussion: Proposed sewerage component in Bharatpur City, Location of Proposed Components and existing sewerage system including network, SPS & STPs.

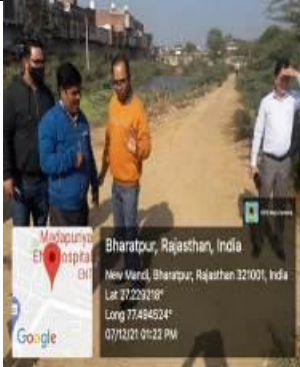
Outcome of Consultation: i) There are 2 nos. STPs including one is operation and one is near the commission, ii) 2 nos new STPs one in RUIDP –IV and other in AMRUT–III are proposed and iii) Zone 1, 3 & 4 are taken under this RUIDP-IV project.

B. Public Consultation

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

Table Appendix 12 A: Details of Public Consultation

Date and Location	Participants			Topic Discussed	Outcome	Photographs
	Total	Male	Female			
07.12.2021, Near Indra Park, Bharatpur	12	12	00	Project components under RSTDSP and the benefits to the Community. Process of logging grievance and its mechanism under the project.	Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are	

Date and Location	Participants			Topic Discussed	Outcome	Photographs
	Total	Male	Female			
				Present status and access of Waste Water facilities in the town and other concerned issues and challenges . Willingness of local public to pay for improved services.	prone to practice open defecation. Process of grievance mechanism was also briefed with participants for lodging complaints. Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. Participants are happy with proposed project and are willing to pay for improved sewerage services in the town.	
07.12.2021, Brajwasi Kund, Bharatpur	07	07	00	Project components under RSTDSP and the benefits to the Community. Present status and access of Water Supply and drinking water facilities in the town and other concerned issues and challenges . Process of logging grievance and its mechanism under the project.	Pipeline laying work for water supply is proposed in the area and it was informed by nearby habitation that water facility is provided by concerned department but water supply is intermittent on alternate days along with quality of water is also not good. Process of grievance mechanism was also briefed with participants for lodging complaints. Participants are happy with proposed project and are willing to pay for improved sewerage services in the town.	 

Date and Location	Participants			Topic Discussed	Outcome	Photographs
	Total	Male	Female			
				Willingness of local public to pay for improved services.		
07.12.2021, Near Nehru Park, Bharatpur	10	05	05	Project components under RSTDSP and the benefits to the Community. Process of logging grievance and its mechanism under the project. Present status and access of Waste Water facilities in the town and other concerned issues and challenges. Willingness of local public to pay for improved services.	Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. Process of grievance mechanism was also briefed with participants for lodging complaints. Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. Participants are happy with proposed project and are willing to pay for improved sewerage services in the town.	 

Date and Location	Participants			Topic Discussed	Outcome	Photographs
	Total	Male	Female			
07.12.2021, Saligram Kund, Bharatpur	24	14	10	Project components under RSTDSP and the benefits to the Community. Present status and access of Water Supply and drinking water facilities in the town and other concerned issues and challenges. Process of logging grievance and its mechanism under the project. Willingness of local public to pay for improved services.	Pipeline laying work for water supply is proposed in the area and it was informed by nearby habitation that water facility is provided by concerned department but water supply is intermittent on alternate days along with quality of water is also not good. Process of grievance mechanism was also briefed with participants for lodging complaints. Participants are happy with proposed project and are willing to pay for improved sewerage services in the town.	 
07.12.2021 Near STP worksite, Bharatpur	12	12	00	Project components under RSTDSP and the benefits to the Community. Present status and access of Water Supply and	Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are	

Date and Location	Participants			Topic Discussed	Outcome	Photographs
	Total	Male	Female			
				drinking water facilities in the town and other concerned issues and challenges . Process of logging grievance and its mechanism under the project. Willingness of local public to pay for improved services.	prone to practice open defecation. Process of grievance mechanism was also briefed with participants for lodging complaints. Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. Participants are happy with proposed project and are willing to pay for improved sewerage services in the town.	
07.12.2021 Nagar Parishad, Bharatpur	06	06	00	Proposed water supply works and availability of land, requirement of No objection certificate etc	Meeting with Nagar Parishad A.En, J.En, ward, councilors and officials and discussion were done about proposed project under phase-4. Nagar Parishad officers and officials assured of their full cooperation with RUIDP/RSTDSP during planning and implementation of the project	

Date and Location	Participants			Topic Discussed	Outcome	Photographs
	Total	Male	Female			
						
07.12.2021 Red Cross Circle, Bharatpur ; Indra Gandhi Park	15	15	00	Project components under RSTDSP and the benefits to the Community. Process of logging grievance and its mechanism under the project. Present status and access of Waste Water facilities in the town and other concerned issues and challenges. Willingness of local public to pay for improved services.	Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. Process of grievance mechanism was also briefed with participants for lodging complaints. Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. Participants are happy with proposed project and are willing to pay for improved sewerage services in the town.	

Date and Location	Participants			Topic Discussed	Outcome	Photographs
	Total	Male	Female			
07.12.2021 Bharjwasi Khund; Bharatpur	10	06	04	Project components under RSTDSP and the benefits to the Community. Process of logging grievance and its mechanism under the project. Present status and access of Waste Water facilities in the town and other concerned issues and challenges. Willingness of local public to pay for improved services.	Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. Process of grievance mechanism was also briefed with participants for lodging complaints. Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. Participants are happy with proposed project and are willing to pay for improved sewerage services in the town.	
07.12.2021 Shani Dev Mandir; Hiradas; Bharatpur	05	05	00	Project components under RSTDSP and the benefits to the Community. Process of logging grievance and its mechanism under the project.	Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are	

Date and Location	Participants			Topic Discussed	Outcome	Photographs
	Total	Male	Female			
				Present status and access of Waste Water facilities in the town and other concerned issues and challenges . Willingness of local public to pay for improved services.	prone to practice open defecation. Process of grievance mechanism was also briefed with participants for lodging complaints. Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. Participants are happy with proposed project and are willing to pay for improved sewerage services in the town.	
07.12.2021 Nehru Park; Bharatpur	04	04	00	Project components under RSTDSP and the benefits to the Community. Process of logging grievance and its mechanism under the project. Present status and access of Waste Water facilities in the town and other concerned issues and challenges . Willingness of local public to	Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. Process of grievance mechanism was also briefed with participants for lodging complaints. Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households.	 

Date and Location	Participants			Topic Discussed	Outcome	Photographs
	Total	Male	Female			
				pay for improved services.	Participants are happy with proposed project and are willing to pay for improved sewerage services in the town.	
07.12.2021 Shaligram Khund; Bharatpur	16	10	06	Project components under RSTDSP and the benefits to the Community. Process of logging grievance and its mechanism under the project. Present status and access of Waste Water facilities in the town and other concerned issues and challenges. Willingness of local public to pay for improved services.	Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. Process of grievance mechanism was also briefed with participants for lodging complaints. Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. Participants are happy with proposed project and are willing to pay for improved sewerage services in the town.	 

Date and Location	Participants			Topic Discussed	Outcome	Photographs
	Total	Male	Female			
31.05.2022 Ganga Mandir; Bharatpur	12	12	00	Project components under RSTDSP and the benefits to the Community. Process of logging grievance and its mechanism under the project. Present status and access of Waste Water facilities in the town and other concerned issues and challenges. Willingness of local public to pay for improved services.	Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. Process of grievance mechanism was also briefed with participants for lodging complaints. Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. Participants are happy with proposed project and are willing to pay for improved sewerage services in the town.	
31.05.2022 City Gate; Bharatpur	05	05	00	Project components under RSTDSP and the benefits to the Community. Process of logging grievance and its mechanism under the project.	Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are	

Date and Location	Participants			Topic Discussed	Outcome	Photographs
	Total	Male	Female			
				Present status and access of Waste Water facilities in the town and other concerned issues and challenges . Willingness of local public to pay for improved services.	prone to practice open defecation. Process of grievance mechanism was also briefed with participants for lodging complaints. Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. Participants are happy with proposed project and are willing to pay for improved sewerage services in the town.	
31.05.2022 Khumhar Gate; Bharatpur	05	05	00	Project components under RSTDSP and the benefits to the Community. Process of logging grievance and its mechanism under the project. Present status and access of Waste Water facilities in the town and other concerned issues and challenges . Willingness of local public to	Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. Process of grievance mechanism was also briefed with participants for lodging complaints. Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households.	

Date and Location	Participants			Topic Discussed	Outcome	Photographs
	Total	Male	Female			
				pay for improved services.	Participants are happy with proposed project and are willing to pay for improved sewerage services in the town.	
31.05.2022 Suraj Pole; Bharatpur	04	04	00	Project components under RSTDSP and the benefits to the Community. Process of logging grievance and its mechanism under the project. Present status and access of Waste Water facilities in the town and other concerned issues and challenges. Willingness of local public to pay for improved services.	Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. Process of grievance mechanism was also briefed with participants for lodging complaints. Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. Participants are happy with proposed project and are willing to pay for improved sewerage services in the town.	

Date and Location	Participants			Topic Discussed	Outcome	Photographs
	Total	Male	Female			
31.05.2022 Chand Pole; Bharatpur	03	02	01	Project components under RSTDSP and the benefits to the Community. Process of logging grievance and its mechanism under the project. Present status and access of Waste Water facilities in the town and other concerned issues and challenges. Willingness of local public to pay for improved services.	Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. Process of grievance mechanism was also briefed with participants for lodging complaints. Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. Participants are happy with proposed project and are willing to pay for improved sewerage services in the town.	
31.05.2022 Atal Gate and; Govardhan Gate; Bharatpur	05	05	00	Project components under RSTDSP and the benefits to the Community. Process of logging grievance and its mechanism under the project.	Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are	

Date and Location	Participants			Topic Discussed	Outcome	Photographs
	Total	Male	Female			
				Present status and access of Waste Water facilities in the town and other concerned issues and challenges . Willingness of local public to pay for improved services.	prone to practice open defecation. Process of grievance mechanism was also briefed with participants for lodging complaints. Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. Participants are happy with proposed project and are willing to pay for improved sewerage services in the town.	
31.05.2022 Anah Gate and; Neemda Gate; Bharatpur	06	06	00	Project components under RSTDSP and the benefits to the Community. Process of logging grievance and its mechanism under the project. Present status and access of Waste Water facilities in the town and other concerned issues and challenges . Willingness of local public to	Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. Process of grievance mechanism was also briefed with participants for lodging complaints. Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households.	 

Date and Location	Participants			Topic Discussed	Outcome	Photographs
	Total	Male	Female			
				pay for improved services.	Participants are happy with proposed project and are willing to pay for improved sewerage services in the town.	
31.05.2022 Brij Bihari Khund and; Town Hall; Bharatpur	09	09	00	Project components under RSTDSP and the benefits to the Community. Process of logging grievance and its mechanism under the project. Present status and access of Waste Water facilities in the town and other concerned issues and challenges. Willingness of local public to pay for improved services.	Pipeline laying work for sewerage is proposed in the area and it was informed by nearby habitation that proper and structured sewerage facilities are not available in this part of the town and residents have their own septic tanks and soak pits. Some people living in outskirts area are prone to practice open defecation. Process of grievance mechanism was also briefed with participants for lodging complaints. Drinking water is providing by PHED, but the supply is intermittent on alternate days which is less than requirement of households. Participants are happy with proposed project and are willing to pay for improved sewerage services in the town.	 

Attendance sheet of Public consultation at Shaligram kund

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

Consultations with Stakeholders

Project Town... Bharatpur

Name of Project: Rehabilitation ^{city} _{develop} _{ment}

Date: 07/12/2021

Place of Consultation Shaligram kund

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	Jiten Kumar	Resident	9983602671	
2	Umesh	Student	6367923645	
3	Kanha	Student	" "	
4	Nitin	student	6376770258	
5	Mannu	Local Resident	9119225273	
6	Lachhadevi	" "	9782334936 6376770252	
7	Sudhama devi	" "	6376770252	
8		" "		
9	Kamla devi	Local Resident	6376770252	
10	Suman devi	" "	9119225273	
11				
12	Leela Vathi	Local Resident	9119225273	
13	Abhishek Tiwari	Local	9414025258	
14	Suresh	Self	6375918213	
15	Pankaj Singh	Resident	9460718174	
16	Kaushal devi	"	9785645525	
17	Urmil	Student	7877130577	
18	Chanchal	shop keeper	—	
19	Suman			
20	Darzi	Student	7877114436	

Anil Kumar (CMSCOI; Jaipur Zone)

Attendance sheet of Public consultation at Bharjwasi Khund

Consultation with Stakeholders (Panning/implementation Phase)

Project Town: Bharjwasi

Date: 07/12/2021

Name of the project: Beautification / City Development

Place of consultation: Bharjwasi Khund

S.No.	Name and mobile no.	Designation and/or Address	Topics Discussed	Outcome of the consultation	Signature
1	Yuvraj (992088583)	Local Resident	1. Awareness about the project 2. Present status of site/project 3. Status of water supply/ Drainage/sewerage in town 4. Requirement of any tree cutting due to project	Local Resident was agreed with the Area Development	
2	Krishna Sharma (6350508314)	Local Resident	5. Presence/movement of wild fauna at project town/project sites	" "	
3	Aarti Sharma (6350508314)	Local Resident	6. Whether project is beneficial for citizens and increase citizen's convenience	" "	
4	Beorvasi Singh (992917137)	Ex-Army Person (Resident)	7. Whether project is causing any livelihood impact to someone 8. Any historical or cultural monuments in town/near project sites	" "	
5	Man Singh (-)	Local Resident	9. Any suggestion about the project 10. Any other relevant information found at site	" "	

Hari Kumar

(Hari Kumar, (CMSC 01; Jaipur Zone)

Name and Signature of the person who done consultation:

Any special issue noted at site:

Consultation with Stakeholders (Panning/implementation Phase)

Project Town: Bhesitpur

Name of the project: Beautification/City Development

Date: 07/12/2021

Place of consultation: Bhargwasi Khurd

S.No.	Name and mobile no.	Designation and/or Address	Topics Discussed	Outcome of the consultation	Signature
6	Phulwati	Local Resident	1. Awareness about the project 2. Present status of site/project 3. Status of water supply/ Drainage/sewerage in town	Local Resident was agreed with the area development	
7	Shila	Local Resident	4. Requirement of any tree cutting due to project 5. Presence/movement of wild fauna at project town/project sites	u u	
8	Rahul (9772660718)	Student	6. Whether project is beneficial for citizens and increase citizen's convenience 7. Whether project is causing any livelihood impact to someone	u u	
9	Lakshmi Chand	Local Resident	8. Any historical or cultural monuments in town/near project sites 9. Any suggestion about the project	u u	
10	Ravi (998224553)	Student	10. Any other relevant information found at site	u u	

Mani Kumar

Mani Kumar (CMSCOI; Jaipur Zone)

Name and Signature of the person who done consultation:

Any special issue noted at site:

Consultation with Stakeholders (Panning/implementation Phase)

Project Town: Red Cross Circle Bhavnagar

Name of the project: Beautification / City Development
Place of consultation: Indira Gandhi Park.

Date: 07/12/2021

S.No.	Name and mobile no.	Designation and/or Address	Topics Discussed	Outcome of the consultation	Signature
1	Shri H. Khan 8740843514	Machuli Mohalla Bhavnagar	1. Awareness about the project 2. Present status of site/project 3. Status of water supply/ Drainage/sewerage in town	Local Shopkeepers & Local Resident was agreed with Aheadway	[Signature]
2	Lokesh Kumar 8740843514	Machuli Mohalla Bhavnagar	4. Requirement of any tree cutting due to project 5. Presence/movement of wild fauna at project town/project sites	" "	[Signature]
3	Shri H. Khan 8740843514	Sunil Patel Gidder Kand	6. Whether project is beneficial for citizens and increase citizen's convenience	" "	[Signature]
4	Shri H. Khan 8740843514	Machuli Mohalla Bhavnagar	7. Whether project is causing any livelihood impact to someone 8. Any historical or cultural monuments in town/near project sites	" "	[Signature]
5	Shri H. Khan 8740843514	Machuli Mohalla Bhavnagar	9. Any suggestion about the project 10. Any other relevant information found at site	" "	[Signature]

Mani Kumar (Mani Kumar (CM SC OZ ; Jaipur Zone)
Name and Signature of the person who done consultation:

Any special issue noted at site:

Consultation with Stakeholders (Panning/implementation Phase)

Project Town: Red cross circle. | Bhawalpur

Name of the project: Beautification.

Date: 07/12/2024

Place of consultation: Indira Gandhi Park

Date: 09/12/2021		Place of consultation: Indira Nagar, Patna			
S.No.	Name and mobile no.	Designation and/or Address	Topics Discussed	Outcome of the consultation	Signature
6	Le Khanaoj Jyoti 8055204234	Villages Nagar	1. Awareness about the project 2. Present status of site/project 3. Status of water supply/ Drainage/sewerage in town	Local Shopkeepers & Local Resident was agreed with area develop	[Signature]
7	Rinku Kumar 829903732	Red cross circle	4. Requirement of any tree cutting due to project 5. Presence/movement of wild fauna at project town/project sites	" "	[Signature]
8	Hari Kishan	Red cross circle	6. Whether project is beneficial for citizens and increase citizen's convenience 7. Whether project is causing any livelihood impact to someone	" "	[Signature]
9	Bijesh Singh 8740803055	Sat Narayan mandir	8. Any historical or cultural monuments in town/near project sites 9. Any suggestion about the project	" "	[Signature]
10	Gorakh Singh 8432639157	Sat Narayan mandir	10. Any other relevant information found at site	" "	[Signature]

Mani Kumar

Name and Signature of the person who done consultation: Mani Kumar Mani Kumar (CMSCOI; Jaipur Zone)

Any special issue noted at site:

Consultation with Stakeholders (Panning/implementation Phase)

Project Town: Red Cross Circle/ Bhanatpur Name of the project: Beautification/ City Development
 Date: 07/12/2021 Place of consultation: Indira Gandhi Park

S.No.	Name and mobile no.	Designation and/or Address	Topics Discussed	Outcome of the consultation	Signature
11.	Mohan Singh 8502883749	Surat Poo Gulal Kumari	1. Awareness about the project 2. Present status of site/project 3. Status of water supply/ Drainage/sewerage in town	Local Shopkeepers & Local Resident was agreed with awareness	<i>[Signature]</i>
12.	Dileep Singh 8502883749	Indira Gandhi Park	4. Requirement of any tree cutting due to project 5. Presence/movement of wild fauna at project town/project sites	" "	<i>[Signature]</i>
13.	Poojit Kumar 9785112480	Surat Poo Gulal Kumari	6. Whether project is beneficial for citizens and increase citizen's convenience	" "	<i>[Signature]</i>
14.	Dipankar Singh 889687864220	Surat Poo Gulal Kumari	7. Whether project is causing any livelihood impact to someone 8. Any historical or cultural monuments in town/near project sites	" "	<i>[Signature]</i>
15.	Yashwanth Singh 8502096026	Surat Poo Gulal Kumari	9. Any suggestion about the project 10. Any other relevant information found at site	" "	<i>[Signature]</i>

Name and Signature of the person who done consultation: Mani Kumar. (Muni Kumar. (CMSCOI; Jaipur Zone)

Any special issue noted at site:

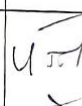
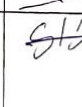
Consultation with Stakeholders (Panning/implementation Phase)

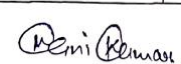
Project Town: Bharatpur

Name of the project: SPS-IV

Date: 07/12/2021

Place of consultation: Mukharji Nagar

S.No.	Name and mobile no.	Designation and/or Address	Topics Discussed	Outcome of the consultation	Signature
1	Deepak 9636666638	Recycler	1. Awareness about the project 2. Present status of site/project 3. Status of water supply/ Drainage/sewerage in town	Local Resident was agreed with the area development	
2	Banvarilal 7891968078	Transport Driver	4. Requirement of any tree cutting due to project 5. Presence/movement of wild fauna at project town/project sites	" "	
3	Rahul 9782391415	Scrap shop	6. Whether project is beneficial for citizens and increase citizen's convenience 7. Whether project is causing any livelihood impact to someone	" "	
4	Panna Lal	shopkeeper	8. Any historical or cultural monuments in town/near project sites 9. Any suggestion about the project	" "	
5	—	—	10. Any other relevant information found at site	—	

Mani Kumar  (CMSCOZ, Jaipur Zone)

Name and Signature of the person who done consultation:

Any special issue noted at site:

Consultation with Stakeholders (Panning/implementation Phase)

Project Town: Bharatpur

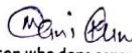
Name of the project: QPS-V

Date: 07/12/2021

Place of consultation: Shubhash Nagar

S.No.	Name and mobile no.	Designation and/or Address	Topics Discussed	Outcome of the consultation	Signature
1	Mustansir Sharma (8619865846)	Colony Residential	1. Awareness about the project 2. Present status of site/project 3. Status of water supply/ Drainage/sewerage in town	Local Resident was agreed with the area development.	
2	Beena Sharma (9694330666)	Residential Personal	4. Requirement of any tree cutting due to project 5. Presence/movement of wild fauna at project town/project sites	u u	
3	Narinder Sharma (7891205694)	u u	6. Whether project is beneficial for citizens and increase citizen's convenience 7. Whether project is causing any livelihood impact to someone	u u	
4	Meena Sharma	u u	8. Any historical or cultural monuments in town/near project sites 9. Any suggestion about the project	u u	
5	Chandrar Sharma (9571750164)	u u	10. Any other relevant information found at site	u u	

Mani Kumari

 (CMSCOZ, Jaipur Zone)

Name and Signature of the person who done consultation:

Any special issue noted at site:

Attendance Sheet – Jama Masjid

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

Project Town.....24th Sector

Name Of Project: Sewerage

Date:.....21.04.22.....

Place of Consultation:.....Jama Masjid.....

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	मनीष	डेली		मनीष
2	पवन	डेली	9764162509	पवन
3	रमेश चन्द	डेली		रमेश चन्द
4	सुरेश पाल	डेली		सुरेश पाल
5	अहमद हमीर			अहमद हमीर
6	मो. इमाम	इमाम	9955622090	मो. इमाम
7	साँस खान	मो. इमाम	9561032001	साँस खान
8				

Attendance Sheet – Kumhar Gate

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

Project Town.....Bharthar

Name Of Project: Sewerage Project

Date:.....21/04/22

Place of Consulta.....

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	राय	गोनी		
2	हरन मेह		9677706095	
3	चरन		947158291	पुष्पमान
4	सुनील	ड्राफ्ट	8098553742	सुनील
5	संजय	ड्राफ्ट	8306671573	संजय
6				

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

Project Town.....Bharthar

Name Of Project: Sewerage Project

Date:.....21/04/22Place of Consultation: BE. ^{NARAIN} ~~AKHAR~~
Gate

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	Sony Sharma	shop	9079763727	शोनी
2	दीप	driver	8875775850	दिलीप
3	Suresh kumar	shop	9667292731	सुरेश कुमार
4	Laxman	Shop	9887557720	लखन
5	Dhan Singh	shop	8690016506	धन सिंह
6				

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

Consultations with Stakeholders

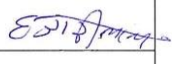
Project Town.....Bharatpur

Name Of Project: Sewerage Project

Date:.....31/05/22

Place of Consultation:.....Mathura Jala

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	विजय रणोदिया	इ.डी.	9600223666	
2	मीनो	इ.डी.		
3	मनो	इ.डी.	9503672720	
4	कुलदीप शर्मा	नव. 1962	9982858087	
5	हमारी लाल	farmer	7297060502	
6				

Attendance Sheet – Mathura Gate

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

Consultations with Stakeholders

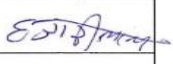
Project Town.....Bharatpur

Name Of Project: Sewerage Project

Date:.....31/05/22

Place of Consultation:.....Mathura Jala

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	विजय रणोदिया	इ.डी.	9600223666	
2	मीनो	इ.डी.		
3	मनो	इ.डी.	9503672720	
4	कुलदीप शर्मा	नव. 1962	9982858087	
5	हमारी लाल	farmer	7297060502	
6				

Attendance Sheet – Chand Pole

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

Consultations with Stakeholders

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

Consultations with Stakeholders

Project Town: Bhartpur

Name Of Project: Sewerage project

Date: 31/07/22

Place of Consultation: ATAL BAND

GATE

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	<u>राजवीर</u>	<u>इंजीनियर</u>	<u>98000 86541327</u>	<u>राजवीर</u>
2	<u>हरीश</u>	<u>इंजीनियर</u>	<u>6367315367</u>	<u>- हरीश</u>
3				
4				

Attendance Sheet – Anah Gate

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

Consultations with Stakeholders

Project Town: Bhartpur

Name Of Project: Sewerage Project

Date: 31/07/22

Place of Consultation: Anah gate

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	<u>विशाल</u>	<u>इंजीनियर</u>	<u>8742878233</u>	<u>विशाल</u>
2	<u>दीपक</u>	<u>इंजीनियर</u>	<u>9694116633</u>	<u>दीपक</u>
3	<u>दीपक</u>	<u>इंजीनियर</u> <u>126A</u>	<u>9028777627</u>	<u>दीपक</u>
4				
5				

Attendance Sheet – Govardhan Gate

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

Consultations with Stakeholders

Project Town.....भरतपुर.....

Name Of Project: Sewerage Project

Date:.....31/05/22.....

Place of Consultation:.....जोबिपन गेट.....

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	<u>राजेश</u>	<u>ड्राफ्ट</u>	<u>8500690051</u>	<u>राजेश</u>
2	<u>प्रवीण कुमार</u>	<u>ड्राफ्ट</u>	<u>9414023586</u>	<u>Praveen Kumar</u>
3	<u>न-प-प-प-प-प</u>	<u>ड्राफ्ट</u>	<u>7537154643</u>	<u>Tanmay</u>
4				
5				

Attendance Sheet – Brij Bihari Kund

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

Consultations with Stakeholders

Project Town.....भरतपुर.....

Name Of Project: Sewerage

Date:.....31/05/2022.....

Place of Consultation:.....ब्रिज बिहारी कुंड.....

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	<u>राजेश</u>	<u>ड्राफ्ट</u>	<u>9799001487</u>	<u>Rajesh</u>
2	<u>मिनेश</u>	<u>ड्राफ्ट</u>	<u>7023615227</u>	<u>Minesh</u>
3	<u>वीरु लाल गुप्ता</u>	<u>Sewerage</u>	<u>7568797220</u>	<u>Veeru Lal Gupta</u>
4	<u>विशाल लाल</u>	<u>मोटील मुरादा</u>		<u>Vishal Lal</u>
5	<u>महेन कुंज</u>		<u>9703857040</u>	<u>Mahen Kunj</u>
6				

Attendance Sheet – Neemda Gate

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

Consultations with Stakeholders

Project Town.....Pharabiv

Name Of Project: Sewerage Project

Date:.....21/01/22

Place of Consultation:.....NEEMDA Gate

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	विजय शर्मा	इंजीनियर	9807498722	विजय शर्मा
2	वसु शर्मा	इंजीनियर	9654975042	वसु शर्मा
3	दीपक		7850006188	दीपक
4				
5				

Attendance Sheet - Town Hall

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

Consultations with Stakeholders

Project Town.....Pharabiv

Name Of Project: Sewerage Project

Date:.....21/01/22

Place of Consultation:.....Town Hall

Attendance Sheet

S.N.	Name	Occupation	Mobile Number	Signature
1	राम कुमार		7740930551	राम कुमार
2	मनीष कुमार		0559556609	मनीष कुमार
3	वसु शर्मा		9807370274	वसु शर्मा
4	दीपक		9772856193	दीपक
5				

Photographs of Leaflet distribution

Bharatpur

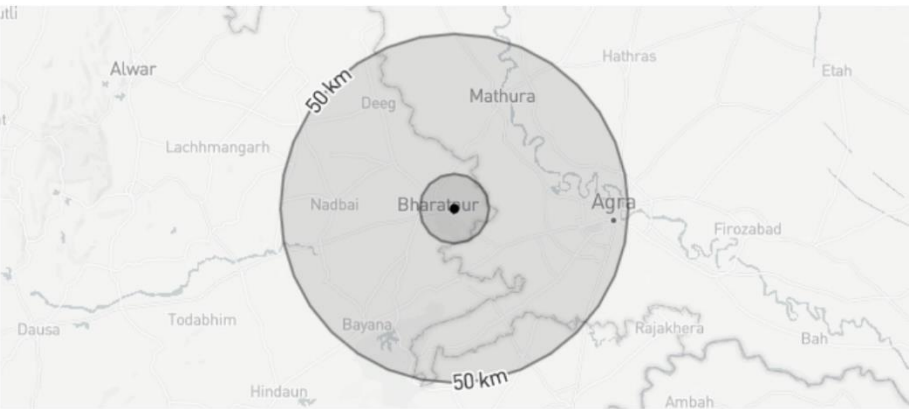


Integrated Biodiversity Assessment Tool
World Bank Group Biodiversity Risk Screen
BHARATPUR PROPOSED STP 14 MLD

- Country: India
- Location: [27.2, 77.5]
- IUCN Red List Biomes: Freshwater, Terrestrial
- Created by: Noime Walican

Overlaps with:

Protected Areas	1 km: 0	10 km: 2	50 km: 0	2
World Heritage (WH)	1 km: 0	10 km: 1	50 km: 0	1
Key Biodiversity Areas	1 km: 0	10 km: 1	50 km: 1	2
Alliance for Zero Extinction (AZE)	1 km: 0	10 km: 0	50 km: 0	0
IUCN Red List	26			
Critical Habitat	Likely			



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



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





About this report

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

Protected Areas:

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

Key Biodiversity Areas:

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

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

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

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

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

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



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Priority Species

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

IUCN Red List of Threatened Species - CR & EN

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

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Batagur kachuga	Red-crowned Roofed Turtle	REPTILIA	CR	Decreasing	Terrestrial, Freshwater
Batagur dhongoka	Three-striped Roofed Turtle	REPTILIA	CR	Decreasing	Terrestrial, Freshwater
Leucogeranus leucogeranus	Siberian Crane	AVES	CR	Decreasing	Terrestrial, Freshwater
Geoclemys hamiltonii	Spotted Pond Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
Hardella thurjii	Crowned River Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
Nilssonia gangetica	Indian Softshell Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
Nilssonia hurum	Indian Peacock Softshell Turtle	REPTILIA	EN	Decreasing	Terrestrial, Freshwater
Amblyceps arunchalensis		ACTINOPTERYGII	EN	Unknown	Freshwater



Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
<i>Oxyura leucocephala</i>	White-headed Duck	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Rynchops albicollis</i>	Indian Skimmer	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Sterna acuticauda</i>	Black-bellied Tern	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Haliaeetus leucoryphus</i>	Pallas's Fish-eagle	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Neophron percnopterus</i>	Egyptian Vulture	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Falco cherrug</i>	Saker Falcon	AVES	EN	Decreasing	Terrestrial, Marine, Freshwater
<i>Leptoptilos dubius</i>	Greater Adjutant	AVES	EN	Decreasing	Terrestrial, Freshwater
<i>Ardeotis nigriceps</i>	Great Indian Bustard	AVES	CR	Decreasing	Terrestrial
<i>Sypheotides indicus</i>	Lesser Florican	AVES	CR	Decreasing	Terrestrial
<i>Vanellus gregarius</i>	Sociable Lapwing	AVES	CR	Decreasing	Terrestrial
<i>Gyps bengalensis</i>	White-rumped Vulture	AVES	CR	Decreasing	Terrestrial
<i>Sarcogyps calvus</i>	Red-headed Vulture	AVES	CR	Decreasing	Terrestrial
<i>Gyps tenuirostris</i>	Slender-billed Vulture	AVES	CR	Decreasing	Terrestrial



Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Gyps indicus	Indian Vulture	AVES	CR	Decreasing	Terrestrial
Manis crassicaudata	Indian Pangolin	MAMMALIA	EN	Decreasing	Terrestrial
Varanus flavescens	Yellow Monitor	REPTILIA	EN	Decreasing	Terrestrial
Aquila nipalensis	Steppe Eagle	AVES	EN	Decreasing	Terrestrial
Ploceus megarhynchus	Finn's Weaver	AVES	EN	Decreasing	Terrestrial

Restricted Range Species

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Leucogeranus leucogeranus	Siberian Crane	AVES	CR	Decreasing	Terrestrial, Freshwater
Xenentodon cancila		ACTINOPTERYGII	LC OR LR/LC	Unknown	Freshwater
Macrobrachium rosenbergii	Giant River Prawn	MALACOSTRACA	LC OR LR/LC	Unknown	Freshwater



Biodiversity features which are likely to trigger Critical Habitat

Protected Areas

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

Area name	Distance	IUCN Category	Status	Designation	Recommendation
Keoladeo National Park	10 km	Not Applicable	Inscribed	World Heritage Site (natural or mixed)	Highest risk. Seek expert help
Keoladeo National Park	10 km	Not Reported	Designated	Ramsar Site, Wetland of International Importance	Assess for biodiversity risk

Key Biodiversity Areas

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

Area name	Distance	IBA	AZE	Recommendation
Keoladeo National Park and Ajan Bande	10 km	Yes	No	Assess for critical habitat
Sur Sarovar Bird Sanctuary	50 km	Yes	No	Assess for critical habitat

Species with potential to occur

Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
REPTILIA	53	11	2	5	4	3	38	1



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Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
AVES	345	28	8	9	11	17	300	0
ACTINOPTERYGII	48	3	0	1	2	3	40	2
MAMMALIA	64	7	0	1	6	4	53	0
AMPHIBIA	10	0	0	0	0	0	10	0
INSECTA	66	0	0	0	0	0	63	3
MALACOSTRACA	11	0	0	0	0	0	10	1
GASTROPODA	33	0	0	0	0	0	31	2
POLYPODIOPSIDA	2	0	0	0	0	0	2	0
MAGNOLIOPSIDA	43	0	0	0	0	0	40	3
LILIOPSIDA	48	1	0	0	1	0	45	2
BIVALVIA	24	0	0	0	0	0	23	1
ARACHNIDA	1	0	0	0	0	0	1	0



Recommended citation

IBAT PS6 & ESS6 Report. Generated under licence 6274-30795 from the Integrated Biodiversity Assessment Tool on 20 May 2022 (GMT). www.ibat-alliance.org

Recommended Experts and Organizations

For projects located in Critical Habitat, clients must ensure that external experts with regional expertise are involved in further assessment (GN6: GN22). Clients are encouraged to develop partnerships with recognized and credible conservation organizations and/or academic institutes, especially with respect to potential developments in natural or Critical Habitat (GN6: GN23). Where Critical Habitats are triggered by priority species, species specialists must be involved. IBAT provides data originally collected by a large network of national partners, while species information is sourced via the IUCN Red List and affiliated Species Specialist Groups. These experts and organizations are listed below. **Please note that this is not intended as a comprehensive list of organizations and experts. These organizations and experts are under no obligation to support any further assessment and do so entirely at their discretion and under their terms. Any views expressed or recommendations made by these stakeholders should not be attributed to the IFC or IBAT for IFC partners.**

Birdlife Partners

URL: <https://www.birdlife.org/worldwide/partnership/birdlife-partners>

Directory for Species Survival Commission (SSC) Specialist Groups and Red List Authorities

URL: <https://www.iucn.org/commissions/ssc-groups>

Appendix 3: Environment Audit Report of Existing Component

A. ENVIRONMENT AUDIT REPORT OF EXISTING 8 MLD STP (ADB funded)

Environmental Audit of Sewage Treatment Plant at Ikran Village Bharatpur of Nagar Nigam Bharatpur (NNB)

Introduction

Under the ADB funded Rajasthan Secondary Towns Development Sector Project (RSTDSP), it is proposed to develop sewer system (sewer collection and conveyance infrastructure) in different STP zone at Bharatpur town. Since adequate capacity treatment facility is already at Bharatpur STP zone, new STP of 8.0 MLD has been constructed near Nagla Gopal Ikran Village (Bharatpur) in RUIDP Phase-I and under operational stage. Sustainability of new sewer infrastructure and realisation of intended purpose (removing the human waste from those areas served by the network rapidly and treated to an acceptable standard) and benefits (Improved environmental conditions, public health etc.) would accrue only with a properly functioning treatment facility. Therefore, the existing STP is an associated facility as per the ADB Safeguard Policy Statement 2009. Compliance with the environmental safeguards will ensure the subproject sustainability.

The objective of this study is to (i) assess the compliance of the existing sewage treatment plant (STP) with country's environmental regulatory framework; (ii) improve environmental performance, as required, through monitoring the effectiveness of the management system; and (iii) increase the RSTDSP's knowledge of its activities, thus increasing its ability to continually improve and minimize future potential liabilities.

Presently there are 8.0 MLD & 5.0 MLD capacities of STPs constructed under previous phases, located at Ikran village in Bharatpur town. 8 MLD STP was constructed under RUIDP, Phase-II have PTU unit of 24 MLD. Second STP of 5 MLD capacity was constructed under AMRUT 1.0

This STP is designed for treatment of 8.0MLD of domestic wastewater. This STP is based on physico-chemical treatment followed by activated sludge process of biological treatment and sludge digestion. It consists of different process units such as SBR Basins, Chlorination Room, Sludge sump, Dosing Tank, Sludge pump house, Centrifuge House etc. The sewage collected through city sewerage system comes to STP and is treated through different units of the system. The flow meter is installed at the inlet which was found working. The STP has a laboratory to analyse the quality of sewage water for necessary parameters.

There is one 180 KVA DG set installed near treatment plant for emergency power supply. The treated sewage is used for plantation and horticulture, excess treated effluent is discharged.

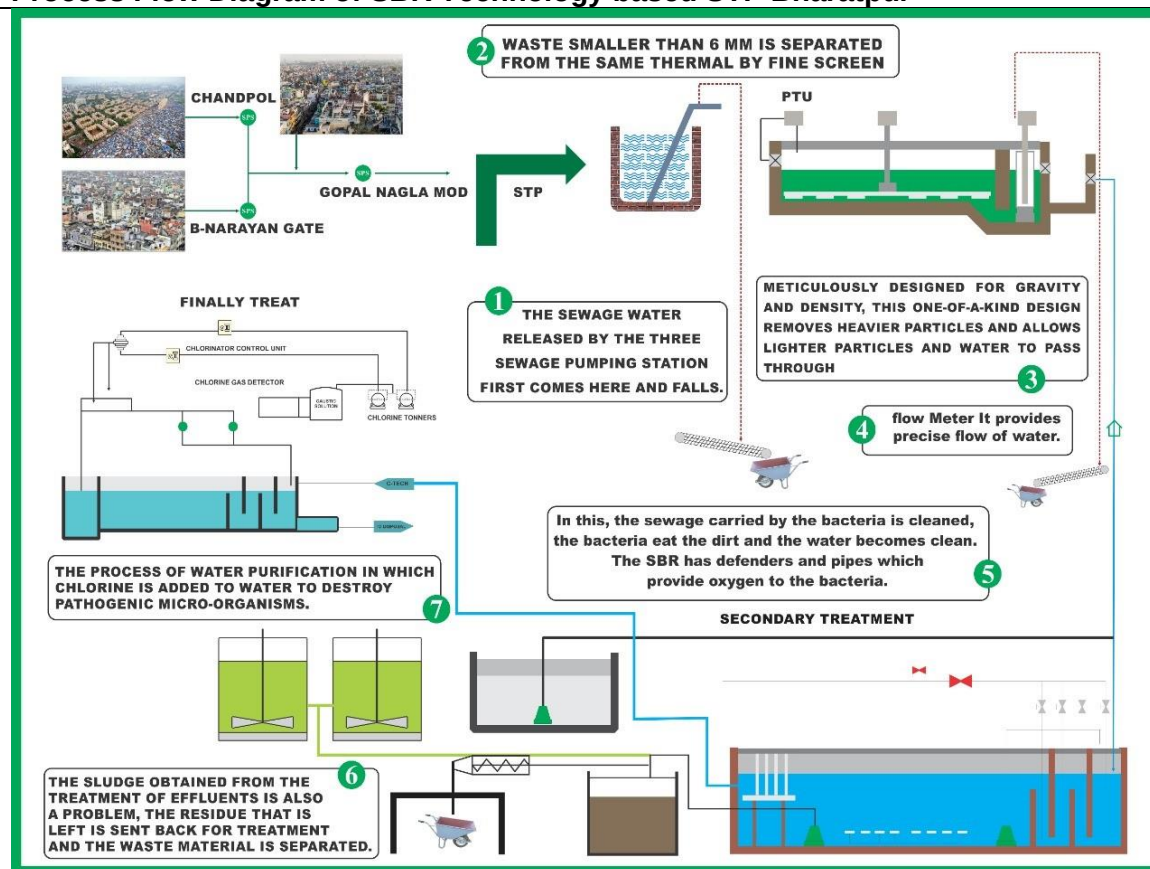
Description of the 8.0MLD STP:

Location	Near Nagla Gopal ,Near Ikran Village (Bharatpur) Latitude: 27°12'16.99"N Longitude: 77°32'49.37"E
Start of operation (year)	01 July 2019
Owned by	Nagar Nigan Bharatpur
Capacity	8.0 MLD
Sewage treatment process	Sequencing Batch Reactor (SBR) sewage treatment plant.

	A Sequencing Batch Reactor (SBR) is a fill and draw activated treatment system. As such, SBR are capable of handling all waste waters commonly treated by conventional activated sludge plants. Municipal and industrial waste waters have both been successfully treated in SBR systems. The unit process involved in the SBR and conventional activated sludge systems are identical. Aeration and sedimentation/clarification are carried out in both systems. However, there is one important difference. In conventional plants, processes are carried out simultaneously in separate tanks, whereas in SBR the processes are carried out sequentially in the same tank. Component of 8.0MLD STP are as follows: <table border="1"> <thead> <tr> <th>Components</th><th>quantity</th></tr> </thead> <tbody> <tr> <td>SBR Basins</td><td>02</td></tr> <tr> <td>Chlorination Room</td><td>01</td></tr> <tr> <td>Sludge sump</td><td>01</td></tr> <tr> <td>Dosing Tank</td><td>02</td></tr> <tr> <td>Sludge Pump House</td><td>01</td></tr> <tr> <td>Centrifuge House</td><td>01</td></tr> </tbody> </table>	Components	quantity	SBR Basins	02	Chlorination Room	01	Sludge sump	01	Dosing Tank	02	Sludge Pump House	01	Centrifuge House	01
Components	quantity														
SBR Basins	02														
Chlorination Room	01														
Sludge sump	01														
Dosing Tank	02														
Sludge Pump House	01														
Centrifuge House	01														
	Treatment Process at STP: Process provides highest treatment efficiency possible in a single step biological process. The system is operated in a batch reactor mode this eliminates all the inefficiencies of the continuous processes, because filling in the basin do not allowed during aeration, settling and decanting, hence after treating one batch another batch will be take in basin. A batch reactor is a perfect reactor, which ensures 100% treatment. Four modules are provided to ensure continuous treatment. The complete process takes place in a single reactor, within which all biological treatment steps take place sequentially. No additional settling unit, secondary RUIDP - ADB DETAILED PROJECT REPORT FOR BHARATPUR TOWN WASTE WATER SYSTEM GREEN CITY SURVEYOR'S (P) LTD, Jaipur 81 VOLUME I- MAIN REPORT clarifier is required. The complete biological operation is divided into cycles. Each cycle is of 3 – 5 hrs duration, during which all treatment steps take place. Explanation of cyclic operation: A basic cycle comprises: (1) Fill-Aeration (F/A) + (2) Settlement (S) + (3) Decanting (D) These phases in a sequence constitute a cycle, which is then repeated. During the period of a cycle, the liquid is filled in the Basin up to a set operating water level. Aeration Blowers are started for aeration of the effluent. After the aeration cycle, the biomass settles, No extra settling unit is required after the aeration basin. The Cyclic Activated Sludge Process/SBR comprises the following features, 1. Biological Selector zone ENSURES NO FOAMING AND BULKING PROBLEMS 2. Oxygen Uptake rate control "OUR" ENSURES 40 - 50% POWER SAVINGS 3. Co Current Nitrification and De nitrification, Phosphorous removal this feature ENSURES more than 80% nitrogen and Phosphorous removal within the same basin without need of any external units, mixers, and recycle pumps etc. 4. decanter														

assembly in stainless steel ENSURES no corrosion, long equipment life, no maintenance 5. Diffusers, Blowers and Aeration grid 6. Submersible pumps for return sludge (RAS) recycle and Surplus sludge (SAS) pumps for sludge wasting reduces space requirement. no secondary clarifier is used which drastically reduces civil cost. 7. PLC unit for complete automatic cycle control and operation reduces manpower cost complete operation can be hooked to central control desk.

Process Flow Diagram of SBR Technology based STP Bharatpur



Process Flow Diagram of Existing 8.0MLD STP

Treatment efficiency

Normally about 60-65% treatment efficiency (BOD removal) is expected in Activated Sludge process STPs.

The Expected raw sewage Characteristics Parameter are as follows

pH – 6.5-7.5

COD – 600 mg/l

BOD – 300 mg/l

TSS – 600 mg/l

TKN- 55 mg/L

TP- 6 mg/L

The treated effluent parameters are 18.05.2017

pH – 7.0-8.0

COD – 100 mg/l

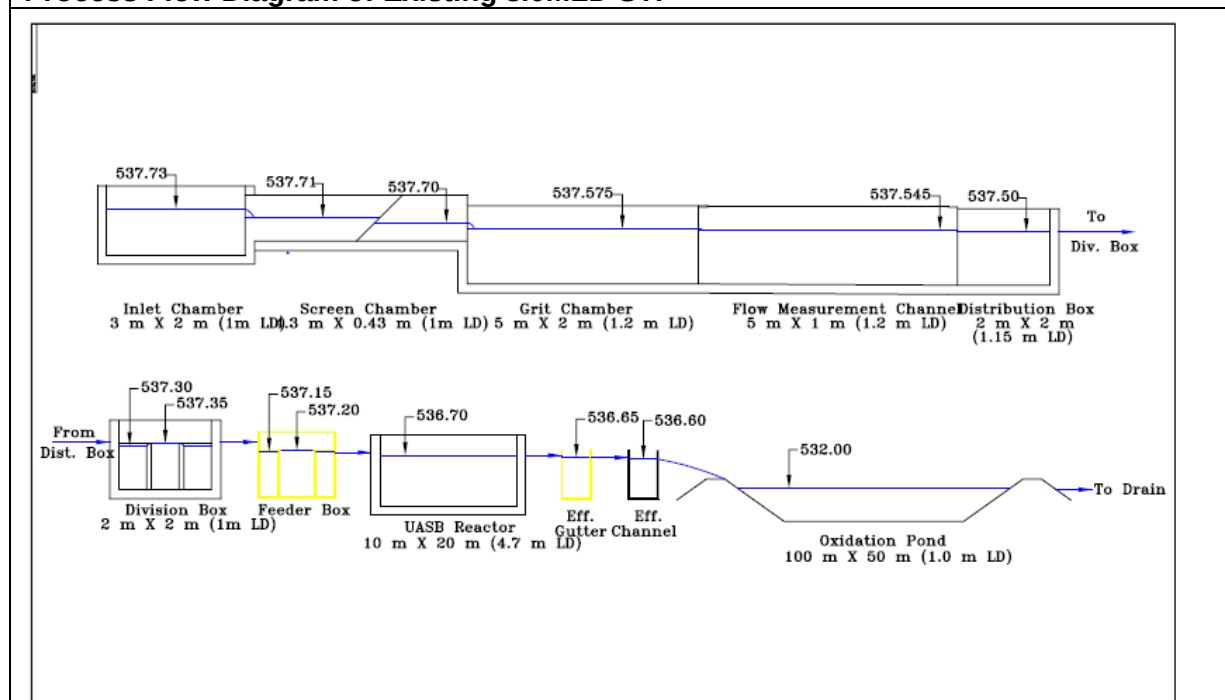
BOD – <10 mg/l

TSS – <10 mg/l

TKN- <10 mg/L

Sludge management	Centrifugal process, average quantity 180-190
Treated wastewater (effluent disposal)	Disposal near by flood Drain
Sludge disposal	Gravity thickeners for sludge from clarifiers, mechanical sludge dewatering system but No sludge drying bed were constructed for existing STP

Process Flow Diagram of Existing 8.0MLD STP



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

Law, Rules, and Regulations	Description and Requirement	STP at Nagla Gopal 8.0MLD
		Y = compliant (if applicable, specify expiration date of permit/clearance) N = non-compliant ²⁶ N/A = not applicable (state justification)
EIA Notification	The EIA Notification of 2006 states that environmental clearance is required for certain defined activities/projects.	N/A Environmental clearance is not required as STPs are not listed in the EIA Notification's "Schedule of Projects"

²⁶Compliant = There is sufficient and appropriate evidence to demonstrate that the particular regulatory requirement has been complied with; non-compliant = clear evidence has been collected to demonstrate the particular regulatory requirement has not been complied with.

		Requiring Prior Environmental Clearance"
Manufacture, Storage, and Import of Hazardous Chemical Rules, 1989	Storage of chlorine (threshold quantity greater than 10 tons but less than 25 tons) in WTPs will require clearance from PESO	N/A No chlorine used or stored in the STP.
Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments	Consent to operate from RSPCB	The 8.0MLD STP has valid CTO under water act from RSPCB – consent order no. 2020-2021/Liquid Waste/10 dated 15.01.2021 Valid from 15/09/2019 to 31/08/2024 For disposal of treated effluent On Land for Plantation/Horticulture after adequate treatment. (Annexure 2)
Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments.	Consent to operate from RSPCB	The 8.0MLD STP has valid CTO under air act from RSPCB- CTO order no 2020-2021/Liquid Waste/10 dated 15.01.2021 Valid from 15/09/2019 to 31/08/2024 for 180 kVA DG Set valid for a period from 15/09/2019 to 31/08/2024 for 180 KVA DG set (Annexure -2)
Environment (Protection) Act, 1986 and CPCB Environmental Standards	Emissions and discharges from the facilities to be created, refurbished, or augmented shall comply with the notified standards. a. Wastewater disposal standards	N As per the CTO issued by RSPCB, STP effluent shall meet the following disposal standards: TSS - Not to exceed 100 mg/l, pH - 6.5 to 9.0, BOD - (3 days at 27°C) Not to exceed 10 mg/l, Fecal Coliform not to exceed 230 MPN/100 ml. but current treatment process is not meeting the required standards.
Noise Pollution (Regulation and Control) Rules, 2002 amended up to 2010	Applicable ambient noise standards with respect to noise for different areas/zones	Y No source of noise
National Institute of Occupational Safety and Health (NIOSH) Publication No. 2002-149	Compliance with NIOSH Guidance for Controlling Potential Risks to Workers Exposed to Class B Bio solids	N Training and proper PPEs are required
Forest (Conservation) Act, 1980 and	As per Rule 6, every user agency, who wants to use any forest land for non-	N/A

Forest Conservation Rules, 2003 as amended	forest purposes shall seek approval of the central government.	
Ancient Monuments and Archaeological Sites and Remains Rules of 1959	No development activity is permitted in the "protected area," and all development activities likely to damage the protected property are not permitted in the "controlled area" without prior permission of the Archaeological Survey of India (ASI). Protected property includes the site, remains, and monuments protected by ASI or the State Department of Archaeology.	N/A
The Child Labour (Prohibition and Regulation) Act, 1986	No child below 14 years of age will be employed or permitted to work in any of the occupations set forth in the Act's Part A of the Schedule or in any workshop wherein any of the processes set forth in Part B of the Schedule are present.	Y STP is operated by contract staff. No children are engaged.

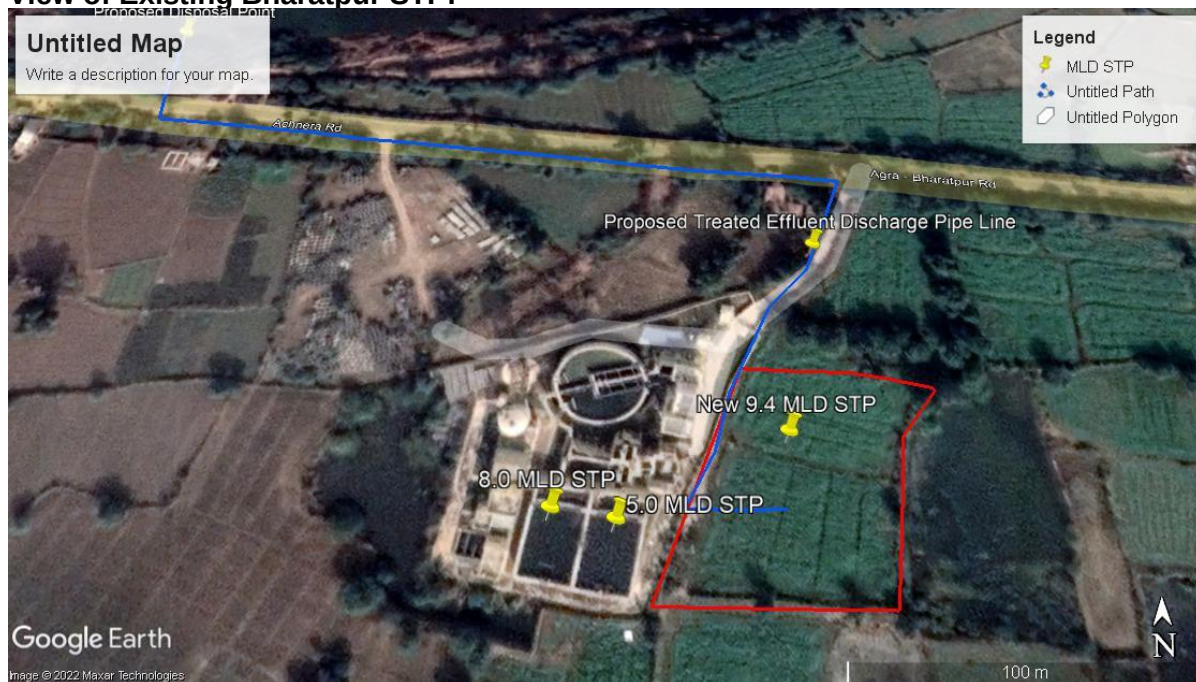
Institutional Arrangement

Parameter	STP
Operations	Continuous operation; involves, mechanical and electrical operation;
Estimated number of technical employees on-site per shift	8.0MLD STP Plant Chemist -02 Senior Chemist-01 (Raju mahavir) Junior Chemist-01 (shubham) Electrician / Instrumental technician (ITI/ Diploma in electrical) -01 (vijendra gurjar) Mechanic-01 (Pappu Yadav)
Estimated number of laborers on-site per shift	
Estimated number of employees in charge of environmental management and monitoring	Nil
Frequency of waste water quality monitoring (raw)	Daily in in house laboratory
Frequency of wastewater quality monitoring (treated)	Daily in in house laboratory
Frequency of sludge quality monitoring	not conducted

Corrective Action Plan : As presented in the above table, there are no regulatory non-compliance issues in the existing infrastructure in 8 MLD existing STP Plant where CTE and CTO are already taken. The environmental concerns are mainly related to occupational health and safety, public safety, disposal of debris, discarded materials etc. Regular compliances should be taken against general and specific conditions given in CTO clearance of STP. The Sludge drying beds were not constructed in existing STP, Proposed STP is designed with sludge drying bed for both new and existing STPs

Existing and Proposed layout of STP showing Sludge drying beds in yellow.



View of Existing Bharatpur STP:

STP Bharatpur. Google Earth image

Annexure -1 Lab testing report of STP effluent at outlet

*** 8MLD STP (SBR PROCESS) NEAR GOPAL NAGALA BHARATPUR (RAJ.) ***										DAILY LAB ANALYSIS REPORT MONTH OF MARCH 2022 ***									
INLET PARAMETERS										OUTLET PARAMETERS									
DATE	FLOW	PH	TSS	COD	BOD ₅	DO	TN	TP	Ph	TSS	COD	BOD ₅	DO	TN	TP	OUTLET	SIGN	REMARKS	
UNIT	M3	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Flow	CHEMIST	CLIENT	
LIMIT	8000	7.5-8.5	650	650	300	-	-	-	-	610	650	10	-	<10	<1	m3			
01-03-2022	5568	7.04	106	146	57	0.43	12.4	4	7.22	9	40	7	2.04	2.6	0.5	4933	212mm		
02-03-2022	5267	7.13	114	184	60	0.41	10.4	3	7.28	8	36	8	2.02	2.4	0.4	5333	212mm		
03-03-2022	5135	7.06	102	192	63	0.43	11.6	4	7.18	9	44	8	2.06	2.8	0.5	5249	212mm		
04-03-2022	5132	7.98	108	200	60	0.32	10.4	3	7.12	9	40	7	2.12	2.4	0.3	5525	212mm		
05-03-2022	5150	7.03	104	224	66.0	0.44	12.4	4	7.28	9	44	8.0	2.09	2.5	0.4	5139	212mm		
06-03-2022	5104	7.24	119	216	70.0	1.32	10.4	3	7.34	8	32	10.0	2.22	2.2	0.3	5254	212mm		
07-03-2022	5254	7.08	110	232	69.0	0.48	12.4	4	7.28	9	36	9.0	2.12	2.1	0.4	5680	212mm		
08-03-2022	5242	7.12	116	208	63.0	0.36	9.6	3	7.36	8	40	7.0	2.10	2.6	0.3	5544	212mm		
09-03-2022	5195	7.22	104	224	65.0	0.42	10.4	4	7.41	9	36	8.54	2.18	2.2	0.4	5231	212mm		
10-03-2022	5169	6.95	102	216	70.0	0.32	11.4	5.0	7.24	8	44	7.0	2.24	2.4	0.5	4982	212mm		
11-03-2022	5278	7.04	114	220	55.0	0.40	10.4	4.5	7.18	7	48	10.0	2.40	3.0	0.8	5115	212mm		
12-03-2022	5248	7.12	108	232	55.0	0.46	10.4	4.0	7.28	9	40	9.0	2.32	2.6	0.4	5154	212mm		
13-03-2022	5191	6.98	104	224	60.0	0.42	11.4	3.0	7.26	8	36	6.66	2.12	2.4	0.5	5652	212mm		
14-03-2022	5243	6.73	110	184	57	1.05	14.0	3.5	7.09	10.0	48	8	2.05	1.5	0.6	5226	212mm		
15-03-2022	5254	6.93	116	208	66	0.80	11.2	4.5	7.1	7.0	46	7	2.09	1.0	0.7	5438	212mm		
16-03-2022	5210	6.90	102	200	63	1.30	9.8	5.0	7.05	9.0	64	8	2.5	2.0	0.5	5255	212mm		
17-03-2022	5335	7.06	120	204	66	1.45	10.4	4.5	7.28	8.0	40	7	2.05	1.5	0.6	6935	212mm		
18-03-2022	7025	6.98	114	192	55	0.66	9.2	4.2	7.21	9	44	9.0	2.12	2.2	0.5	6518	212mm		
19-03-2022	5723	7.02	106	212	60	0.42	15.4	5.0	7.25	8	36	7.0	2.14	2.2	0.7	6132	212mm		
20-03-2022	6132	6.84	110	220	64	0.42	10.4	4.5	7.18	9	40	8.0	2.32	2.1	0.6	4666	212mm		
21-03-2022	4580	6.93	112	200	55	1.35	12.4	5.0	7.20	7.0	48	7.0	2.35	2.0	0.4	2633	212mm		
22-03-2022	2720	7.01	120	196	70	0.50	11.4	4.0	7.08	10.0	44	7.0	2.50	2.5	0.7	2264	212mm		
23-03-2022	1319	7.12	106	192	66	0.45	12.6	4.5	7.25	8.0	36	8.0	2.25	1.5	0.5	1454	212mm		
24-03-2022	5202	7.06	118	220	72	0.55	9.8	5.5	7.21	9.0	48	9.0	2.12	2.0	0.8	4822	212mm		
25-03-2022	5381	7.03	106	212	55	0.48	10.4	5.0	7.18	7.0	52	8.0	2.50	1.5	0.5	5429	212mm		
26-03-2022	4733	6.97	120	196	65	0.30	11.4	5.0	7.12	9.0	44	7.0	3.00	2.5	0.6	3972	212mm		
27-03-2022	5035	7.12	114	228	70	0.46	12.6	4.4	7.28	8.0	40	9.0	2.54	2.6	0.4	5167	212mm		
28-03-2022	6393	7.10	110	220	56	0.54	9.8	4.5	7.20	7.0	48	8.0	2.58	2.8	0.8	5418	212mm		
29-03-2022	5307	6.97	122	196	55	0.40	12.6	3.5	7.15	9.0	44	9.0	2.45	2.4	0.5	3361	212mm		
30-03-2022	5346	7.04	116	212	60	0.35	10.4	4.0	7.25	8.0	36	7.0	3.05	2.5	0.9	6565	212mm		
31-03-2022	5140	6.89	124	220	75	0.48	15.4	4.5	7.13	7.0	40	6.66	2.5	3.0	0.5	5227	212mm		

*** 8 MLD STP (SAR PROCESS) NEAR WAPAL NARAIYA BHARTI

DATE	PARAMETER FLOW	PH	TSS	COD	BOD	ALKALINITY	TKN	TP	DO
UNIT	m ³	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
01-04-2022	5712	6.92	116	228	70.0	2.9	14.0	5.5	0.25
02-04-2022	6049	6.99	120	208	65.0	3.2	12.6	5.0	0.30
03-04-2022	5650	6.97	122	220	75.0	2.8	11.2	4.5	0.19
04-04-2022	5796	6.85	112	200	60.0	3.0	15.4	5.5	0.50
05-04-2022	6146	6.93	108	192	70.0	3.5	9.8	4.0	0.45
06-04-2022	6353	7.04	126	236	66.0	2.4	18.2	4.5	0.35
07-04-2022	4690	7.13	128	228	69.0	3.0	11.2	5.0	0.40
08-04-2022	5692	7.09	130	208	63.0	4.0	15.4	4.5	0.30
09-04-2022	6175	7.03	118	194	70.0	3.5	14.0	3.5	0.45
10-04-2022	6203	6.94	124	220	65.0	3.2	12.6	4.2	0.62
11-04-2022	5357	7.12	108	236	63.0	3.6	11.4	3.8	0.79
12-04-2022	5769	7.16	118	244	69.0	3.4	12.8	4.4	0.34
13-04-2022	5606	6.95	130	228	66.0	4.0	8.4	3.5	0.30
14-04-2022	4310	7.13	114	200	60.0	3.5	16.8	3.0	0.35
15-04-2022	6091	6.93	120	212	63.0	4.0	14.0	4.0	0.46
16-04-2022	5831	7.02	106	232	66.0	3.4	11.4	4.2	0.46
17-04-2022	6120	7.10	114	240	69.0	3.2	12.8	3.4	0.42
18-04-2022	5671	6.92	102	208	63.0	4.2	11.4	3.6	0.48
19-04-2022	5250	7.14	108	224	66.0	4.0	12.8	3.2	0.42
20-04-2022	6087	7.06	110	232	65.0	3.4	11.4	3.8	0.32
21-04-2022	6221	6.96	104	216	60.0	3.1	12.6	4.1	0.36
22-04-2022	6152	6.98	110	240	63.0	3.8	11.2	4.2	0.41
23-04-2022	6125	7.16	118	224	75.0	3.3	11.6	3.8	0.44
24-04-2022	6015	7.04	122	208	66.0	4.2	14.0	3.5	0.50
25-04-2022	6427	6.90	114	232	75.0	3.6	12.6	4.4	0.44
26-04-2022	6622	6.95	110	228	65.0	3.0	11.4	4.5	0.36
27-04-2022	5885	6.93	132	194	60.0	3.5	15.2	3.6	0.40
28-04-2022	6606	7.02	116	224	65.0	4.1	12.4	3.8	0.42
29-04-2022	5420	6.98	126	208	75.0	4.0	14.0	3.5	0.35
30-04-2022	5573	7.05	118	220	65.0	3.9	16.8	3.9	0.15

RAT DAILY LAB ANALYSIS REPORT MONTH OF APRIL 2022 ***

FLOW	P.H	T.S.S	C.O.D	B.O.D	ALKALINITY	T.N	TP	DO	SIGNATURE
m ³	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	LAB. CLIENT
5257	7.18	9.0	44.0	8.0	1.5	1.0	0.5	2.50	Shubh
5698	7.07	7.0	36	9.0	1.8	1.5	0.8	2.35	Shubh
5700	7.15	7.0	48	7.0	1.6	1.8	0.4	2.45	Shubh
6081	7.21	7.0	40	6.66	1.4	1.4	0.7	2.50	Shubh
6377	7.23	9.0	48	7.13	1.3	1.0	0.8	2.48	Shubh
6086	7.22	9.0	44	8.0	1.1	1.5	0.5	2.30	Shubh
4932	7.28	8.0	32	7.0	1.5	1.0	0.8	2.05	Shubh
5951	7.20	7.0	40	7.0	1.8	1.5	0.7	2.40	Shubh
6575	7.23	8.0	48	7.0	1.2	1.3	0.9	2.50	Shubh
6345	7.28	9.0	36	6.0	1.4	1.2	0.8	2.36	Shubh
5260	7.32	8.0	40	7.0	1.2	1.6	0.7	2.34	Shubh
5388	7.41	8.0	32	7.0	1.4	1.4	0.6	2.42	Shubh
6138	7.24	7.0	48	6.66	1.0	1.5	0.4	2.00	Shubh
4381	7.23	9.0	36	8.0	1.5	1.0	0.8	2.50	Shubh
6563	7.20	8.0	44	7.0	1.8	1.2	0.7	2.5	Shubh
4983	7.34	9.0	40	8.0	1.4	1.3	0.6	2.4	Shubh
6376	7.41	8.0	32	7.0	1.2	1.1	0.5	2.32	Shubh
5255	7.32	8.0	36	8.0	1.3	1.2	0.6	2.42	Shubh
6259	7.40	9.0	40	8.0	1.2	1.3	0.4	2.34	Shubh
6139	7.33	8.0	32	3.0	1.1	1.2	0.3	2.28	Shubh
6357	7.24	9.0	36	8.0	1.4	1.1	0.5	2.22	Shubh
573	7.32	8.0	32	7.0	1.2	1.4	0.4	2.36	Shubh
6138	7.38	9.0	40	9.0	1.3	1.2	0.3	2.42	Shubh
6565	7.24	8.0	36	7.0	1.4	1.0	0.5	2.50	Shubh
5699	7.31	9.0	32	8.0	1.2	1.4	0.4	2.46	Shubh
5388	7.24	7.0	44.0	7.0	1.5	1.2	0.7	2.55	Shubh
6041	7.18	8.0	48.0	7.0	1.3	1.0	0.8	2.30	Shubh
573	7.28	9.0	40	7.0	1.5	1.2	0.7	2.38	Shubh
230	7.19	9.0	36.0	10.0	1.4	1.1	0.9	2.40	Shubh
523	7.17	10.0	48.0	8.0	1.6	1.0	0.5	2.55	Shubh

PAGE NO.

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PAGE NO.

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*** BMLD STP [SBR PROCESS] NEAR GOPAL NAGALA BHARATPUR [RAJ.]
INLET PARAMETER

DAILY LAB ANALYSIS REPORT MONTH OF MAY-2022**
OUTLET PARAMETER

INLET - PARAMETER

OUTLET - PARAMETER

DATE	PARAMETER	FLOW	P.H.	T.S.S.	C.O.D.	B.O.D	ALKALINITY	T.KN	T.P	D.O	FLOW	P.H	T.S.S.	C.O.D	B.O.D	ALKALINITY	T.N	T.P	D.O	SIGNATURE	
UNIT		m ³		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	m ³	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	LAB	CLIENT
01/05/22	5801	6.95	116	208	70.0	4.1	15.4	5.0	0.20	6194	7.23	9.0	48	8.33	1.6	1.5	0.5	2.30	Stability		
02/05/22	6063	6.89	120	238	65.0	4.3	11.2	5.5	0.35	5704	7.28	8.0	36	10.00	1.0	1.6	0.6	2.45	Stability		
03/05/22	5981	7.03	128	200	60.0	4.0	14.0	4.5	0.45	6496	7.14	9.0	42	7.14	1.5	0.5	0.3	2.65	Stability		
04/05/22	6073	6.90	132	224	75.0	3.9	18.2	5.0	0.3	6650	7.20	7.0	44	6.66	1.6	0.8	0.5	2.38	Stability		
05/05/22	6320	6.93	118	238	70.0	4.0	14.0	5.5	0.40	6506	7.14	8.0	40	7.14	1.3	0.5	0.1	2.75	Stability		
06/05/22	5617	6.88	124	240	65.0	4.1	7.8	5.0	0.45	6134	7.09	9.0	48	8.34	1.1	0.6	0.5	2.60	Stability		
07/05/22	6525	6.95	112	224	85.0	3.8	12.6	5.5	0.42	5975	7.10	8.0	32	7.13	1.4	1.0	0.3	2.80	Stability		
08/05/22	6277	6.99	110	240	80.0	4.0	8.4	5.0	0.30	6733	7.14	7.0	44	6.67	1.6	1.5	0.5	2.05	Stability		
09/05/22	5177	6.80	128	248	85.0	4.3	11.6	5.5	0.32	6744	7.08	8.0	40	7.14	1.5	0.5	0.7	2.45	Stability		
10/05/22	6203	6.94	130	208	65.0	3.9	14.0	4.5	0.35	6351	7.18	9.0	36	8.33	1.0	0.7	0.3	2.38	Stability		
11/05/22	6290	6.97	114	194	70.0	4.1	7.8	5.0	0.45	5562	7.21	7.0	32	6.67	1.2	0.5	0.6	2.10	Stability		
12/05/22	6288	7.03	118	320	70.0	4.5	18.2	4.0	0.40	5951	7.11	8.0	48	7.18	1.0	0.8	0.5	2.38	Stability		
13/05/22	6598	6.96	126	272	85.0	4.0	11.2	3.0	0.36	5688	7.10	10.0	44	8.57	0.9	1.0	0.5	2.80	Stability		
14/05/22	6013	6.95	130	258	80.0	5.0	15.4	3.5	0.42	5328	7.15	9.0	40	7.14	1.1	1.2	0.6	2.45	Stability		
15/05/22	6387	7.03	116	312	90.0	5.5	14.0	4.5	0.36	5762	7.10	7.0	36	8.33	1.0	0.8	0.5	2.60	Stability		
16/05/22	5446	6.93	130	280	85.0	5.0	8.4	5.5	0.36	5541	7.18	8.0	48	7.50	0.8	1.0	0.7	2.85	Stability		
17/05/22	5120	6.79	124	272	80.0	4.1	11.2	5.0	0.34	5322	7.10	9.0	32	8.0	0.9	1.5	0.5	2.30	Stability		
18/05/22	6024	6.42	96	240	75.0	3.4	11.2	4.4	0.38	5740	6.84	9.0	36	6.66	0.8	1.2	0.8	2.46	212mm		
19/05/22	5329	6.64	112	288	70.0	3.2	14.0	4.6	0.34	5768	6.94	8.0	44	8.0	0.9	1.4	0.6	2.56	212mm		
20/05/22	6476	6.92	88	264	65.0	3.5	11.2	3.8	0.44	5674	7.24	7.0	40	7.5	1.1	1.3	0.5	2.22	212mm		
21/05/22	6590	7.02	82	272	60.0	3.4	14.0	4.2	0.43	6602	7.21	9.0	36	6.66	1.2	1.2	0.4	2.42	212mm		
22/05/22	6195	6.75	92	286	65.0	3.2	9.8	4.1	0.54	6244	7.02	8.0	40	8.0	1.0	0.9	0.5	2.32	212mm		
23/05/22	5430	6.27	106	240	60.0	3.1	8.4	3.8	0.49	5029	6.47	9.0	36	7.5	1.1	1.1	0.6	2.04	212mm		
24/05/22	5408	6.34	114	240	70.0	3.4	9.8	3.9	0.41	5991	6.52	9.0	44	8.0	1.0	1.2	0.7	2.35	212mm		
25/05/22	6757	6.28	122	264	75.0	4.4	12.6	4.4	0.39	6020	6.49	8.0	36	6.66	1.3	1.3	0.5	2.64	212mm		
26/05/22	6319	6.32	128	272	80.0	3.2	11.2	4.6	0.48	5491	6.51	7.0	40	8.0	1.2	1.1	0.7	2.37	212mm		
27/05/22	6741	6.26	108	280	75.0	3.6	12.6	4.2	0.42	5763	6.48	8.0	40	7.5	1.1	1.3	0.6	2.38	212mm		
28/05/22	6256	6.32	116	288	80.0	3.3	9.8	5.4	0.34	6083	6.54	9.0	36	6.66	1.2	1.2	0.5	2.48	212mm		
29/05/22	5509	6.42	120	272	75.0	3.4	11.2	5.2	0.38	705	6.56	9.0	40	8.0	1.1	1.4	0.7	2.70	212mm		
30/05/22	6059	6.34	116	264	70.5	3.2	12.6	4.8	0.42	127	6.45	8.0	44	8.0	1.3	1.3	0.4	2.64	212mm		
31/05/22	6425	6.28	122	280	70	3.0	11.2	5.1	0.36	5570	6.41	8.0	40	7.5	1.6	1.4	0.6	2.54	212mm		

Annexure 2 Copy of Consent to Establish



Head Office (PLG)
Rajasthan State Pollution Control Board
 4, Institutional Area, Jhalana Doongari, Jaipur-302
 004
 Phone: 0141-5159600, 5159695 Fax: 0141-5159697



Registered

File No : F(Tech)/Bharatpur(Bharatpur)/2694(1)/2020-2021/3626-3628

Order No : 2020-2021/PLG/1175

Dispatch Date: 23/11/2020

Unit Id : 97840

M/s Sewage Treatment Plant

Office of Municipal Corporation, Mathura Gate,
 Bharatpur

Sub: **Consent to Establish** under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and under section 21(4) of Air (Prevention & Control of Pollution) Act, 1981.

Ref: Your application(s) for Consent to Establish dated 24/07/2020 and subsequent correspondence.

Sir,

Consent to Establish under the provisions of section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 (hereinafter to be referred as the Water Act) and under section 21 of the Air (Prevention & Control of Pollution) Act, 1981, (hereinafter to be referred as the Air Act) as amended to date and rules & the orders issued thereunder, **is hereby granted** for your **Sewage Treatment plant plant** situated / proposed at **Sewage Treatment Plant, Village Gopal Nagla Achnera Road Bharatpur Tehsil:Bharatpur District:Bharatpur**, Rajasthan under the provisions of the said Act(s). This consent is granted on the basis of examination of the information furnished by you in consent application(s) and the documents submitted therewith, subject to the following conditions:-

- 1 That this Consent to Establish is valid for a period from **24/07/2020** to **30/06/2025** or **date of Commencement of production / commissioning of the project or activities whichever is earlier.**
- 2 That this Consent is granted for manufacturing / producing following products / by products or carrying out the following activities or operation/processes or providing following services with capacities given below.

Particular	Type	Quantity / Capacity
Sewage Treatment Plant	Service	8.00 MLD

- 3 That in case of any increase in capacity or addition / modification / alteration or change in product mix or process or raw material or fuel the project proponent is required to obtain fresh consent to establish.
- 4 That the control equipment as proposed by the applicant shall be installed before trial operation is started for which prior consent to operate under the provision of the **Water Act and Air Act** shall be obtained. This consent to establish shall not be treated as consent to operate.

Page 1 of 5

Signature Not Verified

Digitally signed by Niraj Mathur
 Date: 2020.11.23 11:35:58 IST
 Reason: SelfAttested
 Location:





Head Office (PLG)
Rajasthan State Pollution Control Board
4, Institutional Area, Jhalana Doongari, Jaipur-302
Phone: 0141-5159600, 5159695 Fax: 0141-5159697

Registered

File No : F(Tech)/Bharatpur(Bharatpur)/2694(1)/2020-2021/3626-3628

Order No : 2020-2021/PLG/1175

Dispatch Date: 23/11/2020

Unit Id : 97840

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

Type of effluent	Max. effluent generation (KLD)	Quantity of effluent to be recycled (KLD)	Quantity of treated effluent to be disposed (KLD) and mode of disposal
Domestic Sewage	8000.000	NIL	8,000.000 On Land For Plantation/Horticulture after adequate treatment

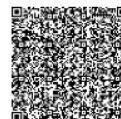
- 6 That the sources of air emissions along with pollution control measures and the emission standards for the prescribed parameters shall be as under:

Sources of Air Emissions	Pollution Control Measures	Prescribed	
		Parameter	Standard
D.G.Set(180KVA)	ACOUSTIC ENCLOSURE , WITH ADEQUATE STACK HEIGHT	--	--

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

Signature Not Verified

Digitally signed by Niraj Mathur
 Date: 2020.11.23 11:35:58 IST
 Reason: Self Attested
 Location:





Head Office (PLG)
Rajasthan State Pollution Control Board
 4, Institutional Area, Jhalana Doongari, Jaipur-302
 Phone: 0141-5159600, 5159695 Fax: 0141-5159697

Registered

File No : F(Tech)/Bharatpur(Bharatpur)/2694(1)/2020-2021/3626-3628

Order No : 2020-2021/PLG/1175

Dispatch Date: 23/11/2020

Unit Id : 97840

Parameters	Standards
pH Value	Between 5.5 to 9.0
Phosphate as P	Not to exceed 1.0 mg/l
Biochemical Oxygen Demand (3 days at 27C)	Not to exceed 10 mg/l
Chemical Oxygen Demand	Not to exceed 50 mg/l
Fecal Coliform	not to exceed 230 MPN/100 ml
N total	10 mg/l

- 8 In addition to above total suspended solids in the treated effluent before disposal shall not exceed 20 mg/L.
- 9 That fee for this consent to establish has been deposited on the basis of estimated project cost of Rs. 723 lacs and in case of any increase in the project cost, the project proponent shall be liable to deposit balance amount.
- 10 That no treated/untreated effluent shall be discharged into any water body and entire treated sewage shall be utilized in plantation/horticulture/ other gainful purposes.
- 11 That the sludge will be properly digested, de-watered and used as manure or disposed in a scientific manner.
- 12 That the unit shall undertake spray of insecticides from time to time to control fly/mosquito growth in the area.
- 13 That the unit shall undertake plantation in two rows of suitable species all along the periphery of the site of the STP to control foul smell.
- 14 That above stated effluent standards are subject to the Hon'ble NGT order dated 30/4/2019 in matter of O.A. no 1069/2018 Nitin Shankar Deshpande Vs Union of India and Ors.
- 15 That efforts should be made to reuse the treated sewage to the maximum possible extent and minimize its discharge. A network of pipelines should be laid from the treated sewage collection tank to fields for utilisation.
- 16 That adequate measures shall be taken to avoid foul odour during treatment and disposal of sewage and sludge.
- 17 That the unit shall maintain adequate height of stack along with acoustic enclosures on one D.G.Set of 180 KVA.

Page 3 of 5

Signature Not Verified

Digitally signed by Niraj Mathur
 Date: 2020.11.23 11:35:58 IST
 Reason: SelfAttested
 Location:





Head Office (PLG)
Rajasthan State Pollution Control Board
4, Institutional Area, Jhalana Doongari, Jaipur-302
Phone: 0141-5159600, 5159695 Fax: 0141-5159697

Registered

File No : F(Tech)/Bharatpur(Bharatpur)/2694(1)/2020-2021/3626-3628

Order No : 2020-2021/PLG/1175

Dispatch Date: 23/11/2020

Unit Id : 97840

- 18 That, not withstanding anything provided hereinabove, the State Board shall have power and reserves its right, as contained **under section 27(2) of the Water Act and under section 21(6) of the Air Act** to review anyone or all the conditions imposed here in above and to make such variation as it deemed fit for the purpose of compliance of the **Water Act and Air Act**.
- 19 That the grant of this **Consent to Establish** is issued from the environmental angle only, and does not absolve the project proponent from the other statutory obligations prescribed under any other law or any other instrument in force. The sole and complete responsibility, to comply with the conditions laid down in all other laws for the time-being in force, rests with the industry/ unit/ project proponent.
- 20 That the grant of this **Consent to Establish** shall not, in any way, adversely affect or jeopardize the legal proceedings, if any, instituted in the past or that could be instituted against you by the State Board for violation of the provisions of the Act or the Rules made thereunder.
- This **Consent to Establish** shall also be subject, beside the aforesaid specific conditions, to the general conditions given in the enclosed Annexure. The project proponent will comply with the provisions of the **Water Act and Air Act** and to such other conditions as may, from time to time, be specified by the State Board under the provisions of the aforesaid Act(s). Please note that, non compliance of any of the above stated conditions would tantamount to revocation of **Consent to Establish** and project proponent / occupier shall be liable for legal action under the the relevant provisions of the said Act(s).

This bears the approval of the competent authority.

Yours Sincerely

Group Incharge[PLG]

(A): **Copy To:-**

- 1 Regional Officer, Regional Office, Rajasthan State Pollution Control Board,,Bharatpur to ensure compliance of conditions of CTE.
- 2 Master File.

Page 4 of 5

Signature Not Verified

Digitally signed by Niraj Mathur
 Date: 2020.11.26 11:35:58 IST
 Reason: Self Attested
 Location:



Copy of CTO


Head Office Liquid Waste
Rajasthan State Pollution Control Board
 4, Institutional Area, Jhalana Doongari, Jaipur-302 004
 Phone: 0141-2716852 Fax: 0141-276852



Registered

File No : F(Tech)/Bharatpur(Bharatpur)/2694(1)/2020-2021/4578-4580
 Order No : 2020-2021/Liquid Waste/10
 Unit Id : 97840
 Date: 15/01/2021

M/s Sewage Treatment Plant
 Office of Municipal Corporation, Mathura Gate, Bharatpur

Sub: Consent to Operate under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and under section 21(4) of Air (Prevention & Control of Pollution) Act, 1981.
 Ref: Your application for Consent to Operate dated 15/05/2019 and subsequent correspondence.

Sir,

Consent to Operate under the provisions of section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 (hereinafter to be referred as the Water Act) and under section 21 of the Air (Prevention & Control of Pollution) Act, 1981, (hereinafter to be referred as the Air Act) as amended to date and rules & the orders issued thereunder **is hereby granted** for your Sewage Treatment plant situated at Sewage Treatment Plant, Village Gopal Nagla Achnera Road Bharatpur Tehsil:Bharatpur District:Bharatpur, Rajasthan, subject to the following conditions:-

- 1 That this Consent to Operate is valid for a period from 15/09/2019 to 31/08/2024.
- 2 That this Consent is granted for manufacturing / producing following products / by products or carrying out the following activities or operation/processes or providing following services with capacities given below.

Particular	Type	Quantity with Unit
Sewage Treatment Plant	Service	8.00 MLD

- 3 That this consent to operate is for existing plant, process & capacity and separate consent to establish/operate is required to be taken for any addition / modification / alteration in process or change in capacity or change in fuel.
- 4 That the quantity of effluent generation along with mode of disposal for the treated effluent shall be as under:

Signature Not Verified
 Digitally signed by: Niraj Mathur
 Date: 2021.01.16 16:40:58 IST
 Reason: Self Attested
 Location:

Page 1 of 4



Head Office Liquid Waste
Rajasthan State Pollution Control Board
4, Institutional Area, Jhalana Doongari, Jaipur-302 004
Phone: 0141-2716852 Fax: 0141-276852

Registered

File No : F(Tech)/Bharatpur(Bharatpur)/2694(1)/2020-2021/4578-4580
Order No : 2020-2021/Liquid Waste/10 Date: 15/01/2021
Unit Id : 97840

Type of effluent	Max. effluent generation (KLD)	Recycled Qty of Effluent (KLD)	Disposed Qty of effluent (KLD) and mode of disposal
Domestic Sewage	8000.000	NIL	8,000.000 On Land For Plantation/Horticulture after adequate treatment

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

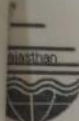
Sources of Air Emissions	Pollution Control Measures	Prescribed	
		Parameter	Standard
DG set(180KVA)	ACOUSTIC ENCLOSURE , ADEQUATE STACK HEIGHT		

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

Parameters	Standards
pH Value	Between 5.5 to 9.0
Phosphate as P	Not to exceed 1.0 mg/l
Biochemical Oxygen Demand (3 days at 27C)	Not to exceed 10 mg/l
Chemical Oxygen Demand	Not to exceed 50 mg/l
Fecal Coliform	Not to exceed 500 MPN/100 ml
N total	

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Date: 2020.04.15 16:40:58 IST
Reason: Self Attested
Location: J

Page 2 of 4



Head Office Liquid Waste
Rajasthan State Pollution Control Board
 4, Institutional Area, Jhalana Doongari, Jaipur-302 004
 Phone: 0141-2716852 Fax: 0141-276852

Registered

File No : F(Tech)/Bharatpur(Bharatpur)/2694(1)/2020-2021/4578-4580

Order No : 2020-2021/Liquid Waste/10

Date: 15/01/2021

Unit Id : 97840

- 7 In addition to above total suspended solids in the treated effluent before disposal shall not exceed 20 mg/l.
- 8 That no treated/untreated effluent shall be discharged into any water body and entire treated sewage shall be utilized in plantation/horticulture/ other gainful purposes.
- 9 That the sludge will be properly digested, de-watered and used as manure or disposed in a scientific manner.
- 10 That the unit shall undertake spray of insecticides from time to time to control fly/mosquito growth in the area.
- 11 That the unit shall undertake plantation in two rows of suitable species all along the periphery of the site of the STP to control foul smell.
- 12 That above stated effluent standards are subject to the Hon'ble NGT order dated 30/4/2019 in matter of O.A. no 1069/2018 Nitin Shankar Deshpande Vs Union of India and Ors.
- 13 That efforts should be made to reuse the treated sewage to the maximum possible extent and minimize its discharge. A network of pipelines should be laid from the treated sewage collection tank to fields for utilisation.
- 14 That adequate measures shall be taken to avoid foul odour during treatment and disposal of sewage and sludge.
- 15 That sample of treated sewage shall be collected/analysed within 30 days and report of analysis shall be submitted to the Board within 15 days thereafter.
- 16 That Online Continuous Effluent Monitoring System(OCEMS) for parameters namely pH, TSS,COD,BOD and flow meter shall be installed and monitoring data shall be connected with the servers of State Board and Central Pollution Control Board before 31.07.2020.
- 17 That regular maintenance and operation of the OCEMS with temper proof mechanism with facilities for calibration shall be ensured.
- 18 That guidelines prescribed by CPCB for OCEMS for effluents and Standard Operating Procedure(SOP) for Verification of Installation and Calibration of UV-Vis Dual Beam Scanning & Multipoint calibration mechanism technology based OCEMS (Effluent) used in STPs shall be followed.
- 19 That, not withstanding anything provided hereinabove, the State Board shall have power and reserves its right, as contained under section 27(2) of the Water Act and under section 21(6) of the Air Act to review any or conditions imposed here in above and to make such variation as it deems fit.

Signature Not Verified
 Digitally signed by Niraj Mathur
 Date: 2021.01.15 10:40:38 IST
 Reason: Self Attested
 Location:

Head Office Liquid Waste
Rajasthan State Pollution Control Board
 4, Institutional Area, Jhalana Doongari, Jaipur-302 004
 Phone: 0141-2716852 Fax: 0141-276852

Registered

File No : F(Tech)/Bharatpur(Bharatpur)/2694(1)/2020-2021/4578-4580
 Order No : 2020-2021/Liquid Waste/10
 Unit Id : 97840
 Date: 15/01/2021

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

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

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

This bears the approval of the competent authority.

Yours Sincerely

Group Incharge[Liquid Waste

(A): Copy To:-

- 1 Regional Officer, Regional Office, Rajasthan State Pollution Control Board, Bharatpur to carry out inspection and sampling of the STP.
- 2 Master File.

Signature Not Verified Group Incharge[Liquid Waste

Digitally signed by Niraj Mathur
 Date: 2021.01.17 16:40:58 IST
 Reason: Self Attested
 Location:

Page 4 of 4



Common Appendices C1 – C24 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 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