Initial Environmental Examination

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

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

Nathdwara Water Supply Works

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

CURRENCY EQUIVALENTS

(as of January 2022)

Currency unit – Indian rupee (₹)
₹1.00 = $ 0.01
$1.00 = ₹ 75.91

ABBREVIATIONS

ADB	–	Asian Development Bank
BOCW	–	Building and other Construction Workers
CGWB	–	central ground water board
CLC	–	city level committee
CPCB	–	central pollution control board
CPHEEO	–	Central Public Health and Environmental Engineering Organization
CTE	–	consent to establish
CTO	–	consent to operate
CWR	–	clear water reservoir
DBO	–	design-build-operate
DPR	–	detailed project report
EHS	–	environmental health and safety
EIA	–	environmental impact assessment
EMP	–	environmental management plan
FAO	–	Food and Agricultural Organization
FCO	–	fertilizer control ordinance
FSSM	–	Fecal Sludge and Septage Management
IEE	–	initial environmental examination
IFC	–	International Finance Corporation
LSGD	–	Local Self Government Department
MOEFCC	–	Ministry of Environment, Forest and Climate Change
OHSR	–	overhead service reservoir
PHED	–	Public Health Engineering Department
PIU	–	project implementation unit
PMU	–	project management unit
PWD	–	Public Works Department
REA	–	rapid environmental assessment
ROW	–	right-of-way
RSPCB	–	Rajasthan State Pollution Control Board
RSTDSP	–	Rajasthan Secondary Towns Development Sector Project
RUDSICO-EAP	–	Rajasthan Urban Drinking Water Sewerage and Infrastructure Corporation Limited-Externally Aided Projects
RUDSICO	–	Rajasthan Urban Drinking Water Sewerage and Infrastructure Corporation
SCADA	–	supervisory control and data acquisition
SBR	–	sequential batch reactor
SEIAA	–	State Environmental Impact Assessment Authority
SPS	–	Safeguard Policy Statement, 2009
STP	–	sewage treatment plant
TEER	–	treated effluent elevated reservoir

TESR	–	treated effluent storage reservoir
ULB	–	urban local body
WHO	–	World Health Organization
WTP	–	water treatment plant

WEIGHTS AND MEASURES

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

NOTE

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

CONTENTS

APPENDICES

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

List of Common Appendices

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.

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

- **Water supply.** : (i) Construction of intake well (11 MLD) at Nand Samand dam at 568.00 m levels with one working and one standby pump, mono rail and Foot Bridge for easy operation and maintenance (ii) Construction of water treatment plant of 11 MLD and one clear water reservoir (CWR) of 1500 kl in existing WTP campus at Nand Samand dam (iii) Construction of 01 numbers of clear water reservoir (CWR) of 900 kL at Ganesh tekri is proposed to be constructed in the PHED campus (iv) Construction of overhead service reservoir of 1500 KL at Nathuwas, PHED campus and 300 KL at Bhandari Bawdi HW (v) New clear water pump house at WTP campus (vi) Transmission mains-16.85 km of diameter ranging from 100 mm to 450 mm. (vii) distribution networks-137.418 km of diameter ranging from 100 mm to 250 mm (viii) Refurbishment of overhead service reservoirs (OHSR), CWRs (ix) Construction of 01 Master Control Centre (MCC), 02 numbers of Consumer Relation Management Centre (CRMC) (x) House Service Connection- 9940

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

Description of the Environment. Subproject components are in Nathdwara town and in its immediate surroundings which were converted into urban use for many years ago, and there is no natural habitat left at the proposed subproject sites. The subproject sites are located in existing road right of way (RoW) and government-owned lands. The proposed intake well, WTP, CWRs and OHSRs will be constructed on vacant government land. There are no trees on the site and is surrounded mostly by urban areas or agricultural areas. About 1700 m proposed rising main is passing through this protected forest block along the existing Haldi ghati road. The Diversion of Forest land will be required for about 1250 sqm (for length 1700m X width 0.75 m)

area for the proposed rising main. The nearest wildlife sanctuary is Kumbalgarh Wildlife Sanctuary at 35 km distance in north-west direction. Badshahi Bagh and Rakt Talai are two ASI protected monuments/ sites in Khamnor village at 6-7 km distance at eastern side of town. Charbhuja Temple Khamnor and Durga Mandir Unwas are state protected monument about 9 km form Nathdwara in eastern direction. Nathdwara town is famous for Srinath Ji temple, and no project activities are proposed within the Temple campus. The nearest pipe laying site to temple campus is approximately 30 m away from its boundary. The main festival celebrated in this temple is Krishna Janmashtami. During the construction phase adequate mitigation measures will be followed and all construction work will be avoided during festivals time to avoid any possibility of inconvenience to public.

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 archaeological resources envisaged. Temporary measures suggested to avoid any disturbance / damage to buildings during laying of water lines in nearby roads. Source of water for town is Nand Samand Dam, assessment confirm the source sustainability to provide additional water, and no water sharing conflicts or downstream impacts envisaged. Total gross storage capacity of Nand Samand Dam is 749.6 MCFT and only 150 MCFT water is allocated (against total demand of 143.2 mcft) for the subproject which is about 20.01 percent of total dam capacity. Other than drinking water propose, water from dam is utilized for irrigation. Due to increase in urban area, irrigation demand is decreasing and expected to decrease further. As per “the Water Policy” of Government of India, in condition of low storage in the dam water the priority of usage is given to drinking water over irrigation. Nand Samand dam is Sufficient to full filling all demand of town water supply, and water from no other source is required.

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

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

health and safety, labour welfare, (vi) provision of walkways and planks over trenches to ensure access will not be impeded; (vii) reuse of excavated materials to extent possible, (viii) spill and sediment control measures to avoid water and soil pollution, etc.,. EMP will guide the environmentally-sound construction of the subproject. EMP includes a monitoring program to measure the effectiveness of EMP implementation and include observations on- and off-site, document checks, and interviews with workers and beneficiaries. A copy of the updated EMP/ site environmental management plan (SEMP) shall be kept on-site during the construction period at all times. The EMP will be included in bids and contracts, and implementation shall be binding on contractors.

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

Consultation, Disclosure and Grievance Redress. The stakeholders were involved in developing the IEE. Informal and formal consultation are conducted with local population of the area at 12 places along with proposed alignment with about 130 persons in month of August 2021 and April 2022. A City Level Committee (CLC) was held and CLC has appreciated and approved the subproject. The IEE will be made available at public locations; this draft IEE will be disclosed to a wider audience via the ADB and RUDSICO websites. Consultation process will continue during project implementation. A grievance redress mechanism (GRM) will be established to redress public grievances.

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

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

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 WTP requires consent to establishment (CTE) and consent to operate (CTO) from Rajasthan Pollution Control Board. CTE will be obtained prior to construction, as the detailed designs will be undertaken by contractor. This IEE needs to be updated during the detailed design, reviewed and approved by ADB, and disclosed prior to start of construction.

I. INTRODUCTION

A. Rajasthan Secondary Town Development Section Project – Additional Financing

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

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

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

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

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

residents and visitors; and (iv) at least four heritage structures are refurbished in five ULBs to improve the living environment and attract more tourists.

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

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

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

B. Purpose of Initial Environmental Examination Report

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

C. Scope of IEE

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

D. Report Structure

7. This Report contains the following sections:

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

II. DESCRIPTION OF THE PROJECT

A. Location of Project town

8. Nathdwara is a town in Rajsamand district of Rajasthan state in India. It is the sub-divisional headquarters of the Nathdwara sub-division in Rajsamand district. It is also the Tehsil

headquarters of the Nathdwara Tehsil. Nathdwara is also Panchayat samiti headquarters of the Nathdwara Panchayat samiti in the district. It is situated on National Highway-58 at a distance of 18 km from Rajsamand in north. It is situated 350 km away from Jaipur in the south-west via NH-58.

9. The town situated as latitude 24°55'47.81"N and longitude 73°49'11.14"E. Nathdwara is a city in the western state of Rajasthan, India. It is located in the Aravalli hills, on the banks of the Banas River in Rajsamand District, 48 kilometers north-east of Udaipur. Shrinathji, is a incarnation of lord Krishna which resembles his 7-year-old "infant" personification of Krishna. Nathdwara City is one of the 40 project towns selected for implementation of the ADB funded RUIDP Phase-IV projects. Under the investment component of the project, it is designed to provide Water Supply System in Nathdwara City and cover whole town within municipal limit by Water Supply.

B. Present Status of Water Supply

10. **Source**– Presently main source of water at Nathdwara town is Surface water from Nand Samand Dam on Banas River. Raw water from Nand Samand Dam is getting treated at WTP at PHED headworks near Nand Samand Dam. The capacity of this WTP is 4.1 MLD and it further supplied treated water to Imli chowck H/W in the city & from there by pumping water is transferred to relate various CWR to various overhead service reservoir & Direct pumping to Zone WDN. Total present production is approximately 4.1 MLD.

11. At present, total gross water supply is 5.6 MLD including 4.1 MLD from Nandsanad WTP and 1.5 MLD from ground water source. The total water losses is approx. 1.5 MLD and after the losses net water supply is approx. 4.1 MLD. Service level of water supply is only 70-80 LPCD (frequency once in a day) at consumers' end, which is less than national standard of 135 LPCD. The proposed water requirement in the 2021 was approx. 8.2 MLD to meet requirement for 135 LPCD supply but in actual it was 70-80 LPCD due to very old distribution network, leakages in the system and not of proper size of supply system.

12. Intake Well and Pump House. An existing intake well is places at Nand Samand Dam with 2 pumps of 40 HP and 1 Pump of 30 HP for supply of water up to WTP. During summers when water level in dam reduces the withdrawal of water is not possible with this intake, therefore a new intake well is proposed at 50 meter distance in north direction where water level in dam is maximum.

13. **Water Treatment Plant (WTP).** One WTP of 4.1 MLD at Nand Samand PHED headworks is in working condition, but the structure of WTP is very old and cannot be used further. After the construction of new 11 MLD WTP, existing 4.1 MLD WTP will be not in use in water supply scheme.

14. **Transmission Mains**- The water transmission for raw water is of 0.3 km of MS, for treated water 15.5 kms of DI K-9/AC/CI is already laid in town from existing WTP to different Head works to various OHSRs located in the city. Dia. of existing lines are from 100 mm to 300 mm. All the lines have been phased out due to poor condition and insufficient diameter for future demand in the project.

15. **Distribution networks.** About 115 km of water distribution network already laid in town. The existing distribution system with AC (86 Kms), DI (9.60 Km) and CI (18.50 kms) pipes. CI and AC pipes are very old and have heavy leakages due to breakages and joints leakages due

to ageing and hence need to be phased out except some newly laid HDPE Lines. The old Asbestos Cement (AC) & CI pipelines will be replaced by the new water distribution system of different sizes of DI pipes.

16. At present, an intermittent water supply system is running in the town with actual service level 70-80 LPCD (frequency once in a day) at consumers' end, which is less than standard of 135 LPCD. The supply duration is about 1 to 1.5 hours twice in a day with low pressure.

C. Infrastructure Improvements Designed in Nathdwara City under RSTDSP

17. **Source of water:** As mentioned above at present the main source of water is Nand Samand dam. The details of surface sources are given below in the **Table 1**.

Table 1: Details of Raw Water Source in Nathdwara

Source	Total storage capacity of dam	Current abstraction	Total water allocation from dam	Percentage of abstraction from dam	Allocated water for town
Nand Samand dam	21.22 MCM or 749.6 mcft or 58.15 MLD	4.1 MLD or 52.85 mcft	4.24 MCM yearly or 150 MCFT yearly or 11.63 MLD	20.01% (proposed) 7.05 % (current abstraction)	11.63 MLD

18. **Water demand & availability:** Zone-wise proposed water demand including net demand and losses is given in **Table 2**. Total gross water demand in 2025 is projected 8.58 MLD.

Table 2: Total Demand of water for town from Nand Samand Dam

S No	Particulars	Unit	Year			
			2021	2025	2040	2055
1	Total Clear Water Demand (MLD)	mld	7.97	8.33	9.59	10.77
2	Gross Raw Water Demand	mld	8.22	8.58	9.89	11.10
3	Gross Raw Water Demand	MCM	3.00	3.14	3.61	4.05
4	Gross Raw Water Demand	Mcft	106.0	110.7	127.6	143.2
5	Water allocation at Nand Samand dam as mentioned in allocation letter of Executive Engineer Water Resource Section (letter No. 3264 dated 09.03.3021-Appendix 5).	McFt	150.00	150.00	150.00	150.00

19. **Source Sustainability:** Total gross storage capacity of Nand Samand Dam is 749.6 MCFT and 150 MCFT water is allocated (against total demand of 143.2 mcft) for the subproject which is about 20.01 percent of total dam capacity. Other than drinking water propose, water from dam is utilized for irrigation. Due to increase in urban area, irrigation demand is decreasing and expected to decrease further. As per "the Water Policy" of Government of India, in condition

of low storage in the dam water the priority of usage is given to drinking water. The existing WTP and intake will not be used for the town after construction of new WTP and Intake.

20. Letter of allocation is attached in Appendix 5. Source sustainability details are given in following Table 3. The gross storage capacity of the dam 21.225 MCM (749.6 mcft), that include live storage of 20.631 MCM (728.62 mcft) and 0.594 MCM (20.97 mcft) dead storage, and top level of dam/top bund level is 584.30 above mean sea level(msl). The total live storage of Nand Samand Dam is 20.631 MCM and the proposed abstraction of water from Nand Samand Dam to meet 135 lpcd supply is 4.24 MCM up to 2055 ultimate year, under proposed Nathdwara Town water supply scheme in RUIDP Phase-IV. The total volume of live storage in this dam, is not used fully in present and proposed supply scheme and only 4.24 MCM storage uses is proposed and remaining quantity will be present in the dam. The table 3 below shows the annual water quality received in dam in last 14 years. The annual water received in Nand Samand dam shows less amount of water received in year 2018-19 i.e 121 mcft than total annual requirement for town i.e 150 mcft. The same is balanced by last years' unused water Other than 2018-19 the dam received quantity of water much higher than required. On the basis of above data analysis, it's come that the proposed water source "Nandsanad dam" is sustainable and required quantity for supply from Nand Samand dam will be continue without any fluctuation.

Table 3: Water level of Nand Samand Dam

S.No	Year	Lowest gauge of dam (ft)	Water avilable at lowest gauge (Mcft)	Net annual water received in reservoir (Mcft)
1	2007-08	6.40	64.00	686.00
2	2008-09	-	-	750.00
3	2009-10	-	-	750.00
4	2010-11	-	-	750.00
5	2011-12	5.50	53.00	697.00
6	2012-13	-	-	750.00
7	2013-14	-	-	380.00
8	2014-15	5.50	53.00	697.00
9	2015-16	7.55	73.50	676.50
10	2016-17	4.80	43.60	706.40
11	2017-18	4.75	43.25	706.75
12	2018-19	3.00	30.00	121.00
13	2019-20	-	-	750.00
14	2020-21	9.25	92.50	657.50

1. Need of the Project

21. At present one rapid gravity water treatment plans of total capacity 4.1 MLD is in function with the existing system, but WTP is not in good condition and does not meet the clear water demand of 2040 so a new 11 MLD WTP is proposed at Nand Samand, Existing rising main of either raw water or clear water is not used as lines are damaged / leaked. Present service level

of water supply is 70-80 LPCD and frequency is once in a day. Considering these facts water supply in the town is proposed to be strengthened.

D. Proposed works under water supply in Nathdwara

(i) Water supply: Development of new infrastructure as required to maintain the continuous water supply with the service level of 135 LPCD.

(ii) Treatment Plants: One 11.0 MLD Water treatment plant is proposed at Nand Samand dam.

(iii) Pumping Stations & pumping machinery: A pumping station is proposed at Nand Samand to feed the balancing reservoirs proposed at Ganesh Takri and Nathuwas.

(iv) Balancing reservoirs: 2 nos. of balancing reservoirs are proposed at Ganesh Takri and Nathuwas to feed all 13 nos. OHSRs. 1500 KL balancing reservoir (OHSR) is proposed at Nathuwas. 900 KL balancing reservoir (CWR) is proposed at Ganesh Takri.

(v) Transmission / Rising Mains: To carry the water from balancing reservoirs to respective ESRs the DI class K-7 rising mains of design sizes are to be laid. From water distribution point of view the entire town has been proposed to be divided into 13 zones. Each zone has been proposed to be fed by its own individual ESR /GLSR. From these SRs clear water shall be distributed among the consumers of the town. Total length of transmission line is 16.850 km including (i) Raw water pumping is 300m from Intake to WTP, (ii) 7.150 km DI K9 from WTP to Ganesh Takri and Ganesh Takri to Nathuwas, (iii) 9.400 km DI K7 CWR to OHSRs

(vi) Zone: The entire town has been proposed to be divided into 13 zones; the clear water is proposed to be supplied by gravity flow through the individual SRs existing in each zone but in Lalbagh area existing SR is not of sufficient capacity and also very old constructed so a new OHSR is proposed as replacement of existing OHSR.

(vii) Distribution System: Further the water shall be distributed among the consumers by gravity flow through distribution system. The existing Distribution System is very old and has been completely phased out. The old distribution system has been laid of AC and PVC pipes of under sizes, therefore leakages / bursting take place frequently in the lines, creating the losses of water leads to the increase in NRW therefore all the pipelines of AC/PVC pipes are proposed to be replaced by DI K-7 pipes in distribution system.

(viii) DMA Methodology: The distribution zones are further sub divided into smaller sub zones called District Meter Area (DMA). Each DMA is the separate portion from other ones. From online monitoring pointing of view of flow and pressure, the DMA Methodology would be quite helpful to reduce the NRW as well as to receive the on-line quick information's about pressure/ flow drop & leakages etc in particular DMA, which can immediately be attended for rectification.

(ix) House Connections: 50% of existing water connections are to be replaced and converted into metered connections and the water tariff is to be revised in rationalized manner.

(x) Power system: To run the pumping system smoothly, the proper power supply system is to be developed, the capacity of transformers, power intake & distribution system are to be augmented if required. To ensure the regular and quality power supply direct feeder / substation are required to be laid. For power

back, up in emergency & outage of electricity the arrangement of DG sets of proper capacities are also required.

(xi) Automation System: In order to supervise the main activities of the system (such as flow, pressure, levels of RWRs/SRs/CWRs etc,) online and better supervising control, a Supervisory control and data acquisition system (SCADA) has been proposed to be provided in the entire system. This would help in reducing the NRW. Details are being discussed in succeeding chapter.

22. Other information's including ownership of required area and function of proposed water supply components are given in Table 4.

Table 4: Proposed Water Supply Components in Nathdwara

Infrastructure	Function	New of under Rehabilitation and Capacity	Location and ownership
Intake well cum pump house	Raw water abstraction from Nand Samand Dam and pumping to WTP.	New - one Capacity of intake and pumping house to abstract 11 MLD water • Intake well cum pump house (diameter - 10 m height - 12 m) • Number of pump: 1W+1S • Discharge: 185.8 LPS • Head: 35 m • • Approach bridge / road • Pumping machinery	568.0 m levels at Nand Samand Dam Ownership: Water Resource Department
Raw water main	Convey raw water from intake to WTP	*New* 300m length 500 mm diameter MS pipe	from intake to WTP
Rapid Gravity Filter Water Treatment Plant	Treatment of raw water to meet drinking water standard	New - 11 MLD capacity water treatment plant with arrangements for • Alum coagulation & flocculation • Sedimentation, • Rapid gravity filtration, • Disinfection with chlorination • Wash water recovery • Sludge drying beds Laboratory, office etc.,	Location: Existing WTP campus at Nand Samand Ownership: PHED
Clear Water Pump House	To provide adequate pressure in water supply system to distribute to consumers directly/transmit water to overhead tanks for gravity supply	New clear water pump house • Pump rooms with all mechanical and electrical equipment • Office areas and wash/toilet facilities	Location: Existing WTP campus at Nand Samand Ownership: PHED

<table>
<tr><th>Infrastructure</th><th>Function</th><th>New of under Rehabilitation and Capacity</th><th>Location and ownership</th></tr>
<tr><td>Clear Water Reservoir (CWR)</td><td>storage of clear water</td><td>New
1500 KL with SCADA</td><td>Location: Existing WTP campus at Nand Samand
Ownership: PHED:</td></tr>
<tr><td></td><td></td><td>Rehabilitation
450 kl with SCADA</td><td>Existing PHED campus Ganesh Takri</td></tr>
<tr><td>Ground Level Service Reservoir (GLSR)</td><td>storage and supply of water</td><td>New
900 KL with SCADA</td><td>Location: Ganesh Tekri
Ownership: PHED</td></tr>
<tr><td>Overhead Service Reservoir (OHSR)</td><td>storage and supply of water by gravity</td><td>New
1500 KL and
300 KL with SCADA</td><td>OHSR 1500 KL
Location: Nathuwas Headworks
Ownership :PHED

OHSR 300 KL
Location: Bhandari Bawri, Zone-14
Ownership: PHED</td></tr>
<tr><td></td><td></td><td>Rehabilitation

Existing 13 OHSR
<table>
<tr><th>Location</th><th>Staging (m)</th><th>Capacity (KL)</th></tr>
<tr><td>Mohan Garh Zone-1</td><td>15</td><td>400</td></tr>
<tr><td>Ganesh Tekri Zone-2</td><td>15</td><td>450</td></tr>
<tr><td>SukhadiyaNager Zone-3</td><td>15</td><td>90</td></tr>
<tr><td>TaliyoKa Talab Zone-5</td><td>15</td><td>200</td></tr>
<tr><td>Nahthuvas Zone-6</td><td>15</td><td>370</td></tr>
<tr><td>Tara Bhuj Zone-7</td><td>15</td><td>600</td></tr>
<tr><td>Police Line Zone-8</td><td>18</td><td>100</td></tr>
<tr><td>SukhadiyNager Zone-9</td><td>18</td><td>200</td></tr>
</table></td><td>Existing location Owned by PHED

Existing OHSRs

1. Mohan Garh Zone-1 400 kl
2. Ganesh Tekri Zone-2 450 kl
3. Sukhadiya Nager Zone-3-90 kl
4. TaliyoKaTalab Zone-5 - 200 kl
5. Nahthuvas Zone-6 - 370 kl
6. Tara Bhuj Zone-7 - 600 kl
7. Police Line Zone-8 - 100 kl
8. Sukhadiy Nager Zone-9 - 200 kl
9. Meera Nagar Zone-10 - 200 kl
10. Bhalowato Ka Kheda Zone-11 - 200 kl
11. Bhrampuri Nathuwas Zone-12 - 200 kl
12. Teliyo Ka</td></tr>
</table>

Infrastructure	Function	New of under Rehabilitation and Capacity			Location and ownership
		Meera Nagar Zone-10	18	200	Talab Zone-13 - 200 kl Proposed Zone-14 - 300 kl
		BhalowatoKaKheda Zone-11	18	200	
		BhrampuriNathuwas Zone-12	18	200	
		TeliyoKa Talab Zone-13	18	200	
Transmission mains and feeder mains	Feeding the water to storage reservoir	New Total Length- 17150 m Pipe materials- DI K-9 and DI K-7 Dia of pipes- 100 mm-450 mm			Transmission pipelines will be mostly laid along the main roads. Pipes will be laid underground. **Location**- Entire town Ownership- Municipal Council, Nathdwara
Distribution networks	Water distribution	New Total Length- 137.418 km Pipe materials- DI K-7 Dia of pipes- 90-315 mm			Pipes will be laid underground along the public roads/streets covering entire area of the town; Location- Entire town Ownership- Municipal Council, Nathdwara
Consumer Relation Management Centres (CRMC) and one Master Control Centre (MCC)	Building for consumers	New 2 - CRMCs and 1 - MCC			Location: to be decided Ownership: Govt. of Rajasthan land
House Service Connections	-	New 9940 Nos			Location: Entire town

23. This subproject complies with the environmental subproject selection criteria agreed between the government and the ADB (Compliance with Environment Criteria checklist is at **Appendix 2**). Details of Proposed Water Supply works are presented in **Figure 1 and 2,** designed components in Google Earth map is given in **Figure 3 to 7,** layout plans of proposed components are given in **Figure 8 & 9,** Proposed Pipe laying near the Srinath Ji Temple given

in **Figure 10** and all components on SOI toposheet is given in **Figure-11**. Coordinates of designed components are given in **Table-5**:

Table 5: Coordinates of Designed component of Water Supply in Nathdwara

Components	Latitude	Longitude
Intake Well (Nand Samand Lake)	24°55'15.01"N	73°46'45.30"E
WTP and CWR (Nand Samand Dam)	24°55'8.75"N	73°46'48.65"E
CWR at Ganesh Tekri	24°55'31.15"N	73°48'45.28"E
OHSR at Nathuwas	24°55'34.99"N	73°49'51.88"E
OHSR at Bhandari Bawri	24°56'36.05"N	73°49'31.08"E

24. Excavation for the pipe laying works will be undertaken maximum through open trenching, which will be maximum width of 1 m only on one side of the road ROW with maximum length, an average 140 m per day for water supply lines. Excavation, laying of pipes and backfilling will be completed within the day. Subsequent to completion of works, road reinstatement will be undertaken by the contractor as part of the civil works. The same shall be mentioned in the bid document to make it binding on the contractor.

Figure 1: ***Zone Map of Nathwara Water Supply Project***

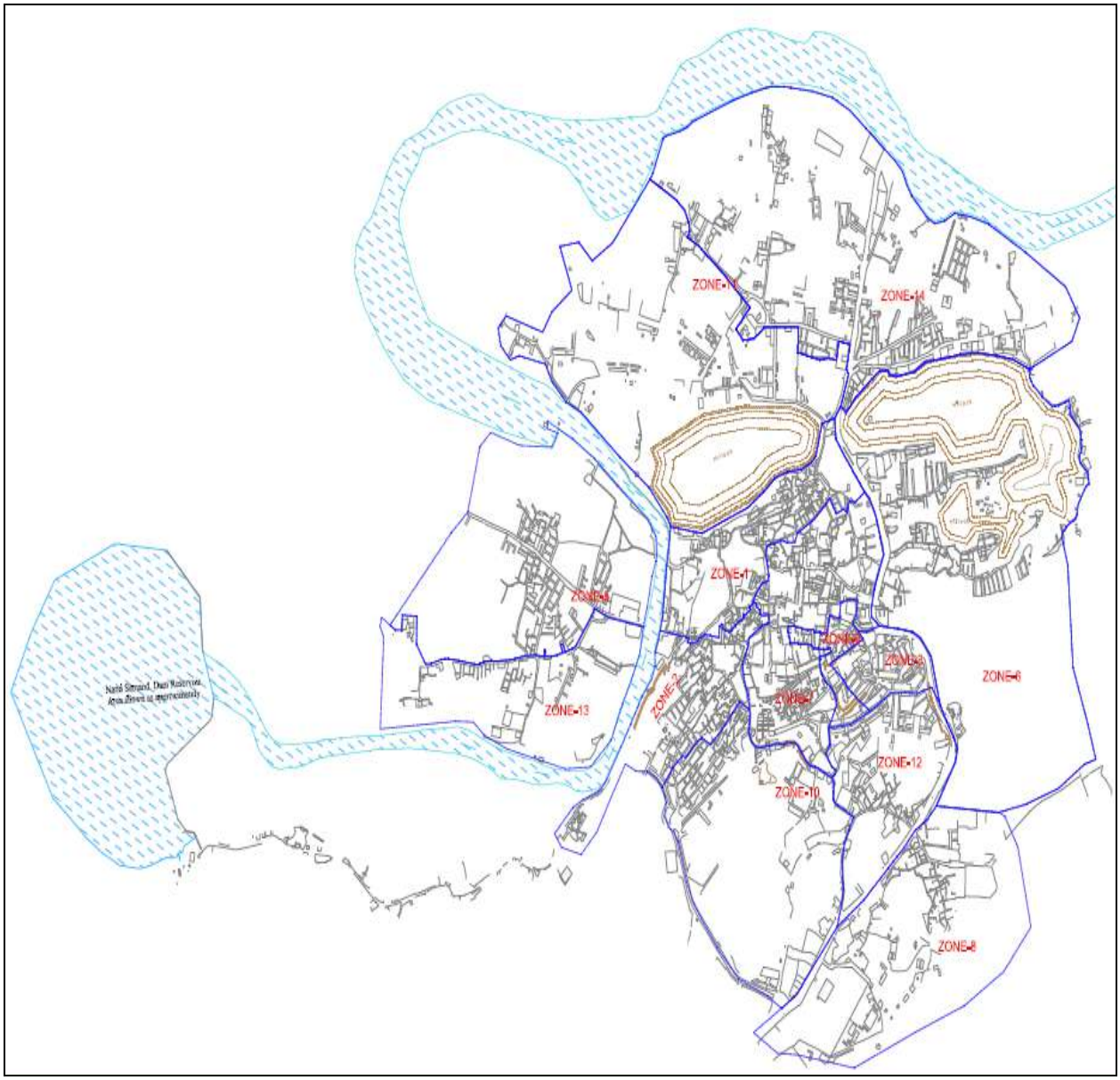


Figure 2: Schematic diagram of designed water supply system- Nathdwara

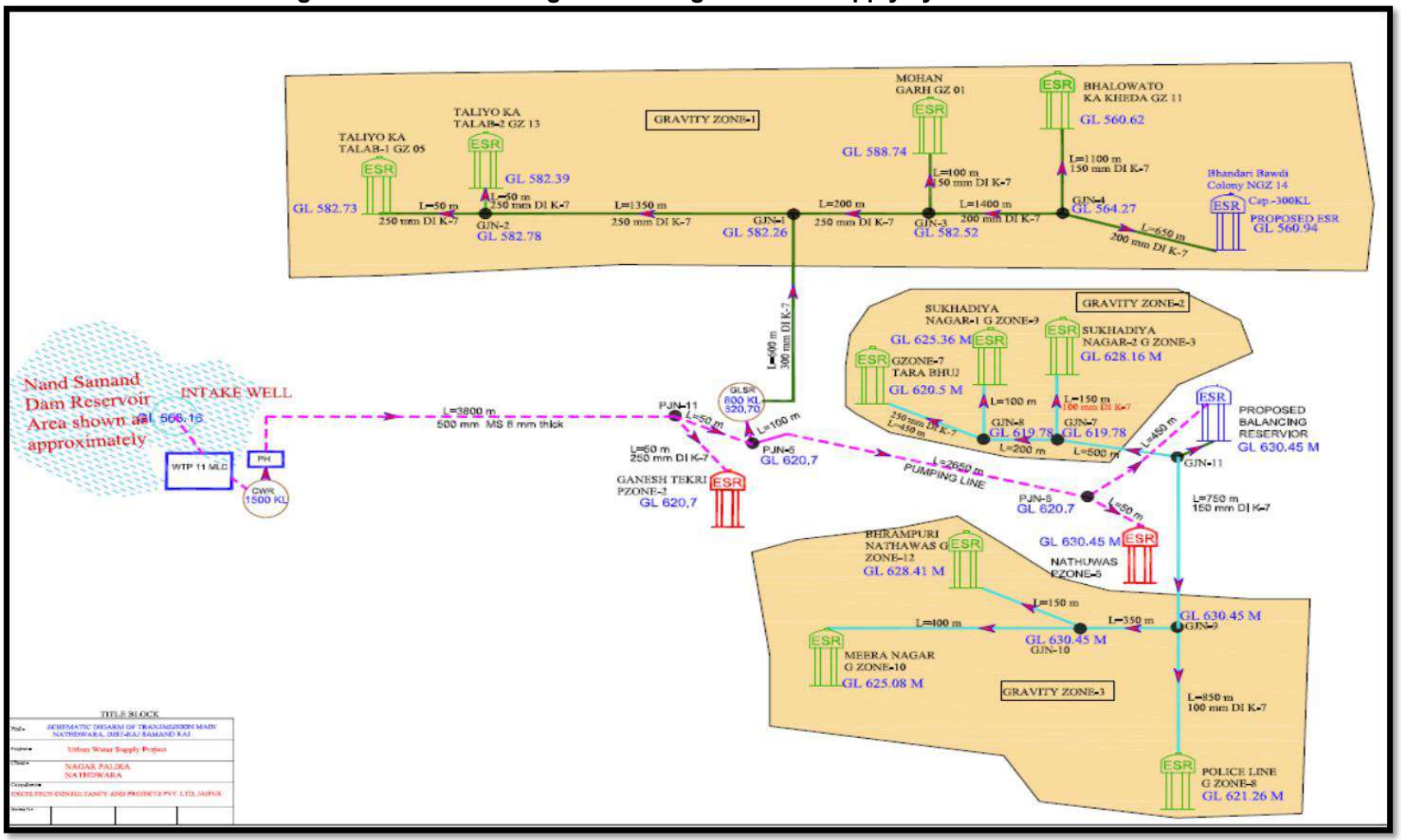
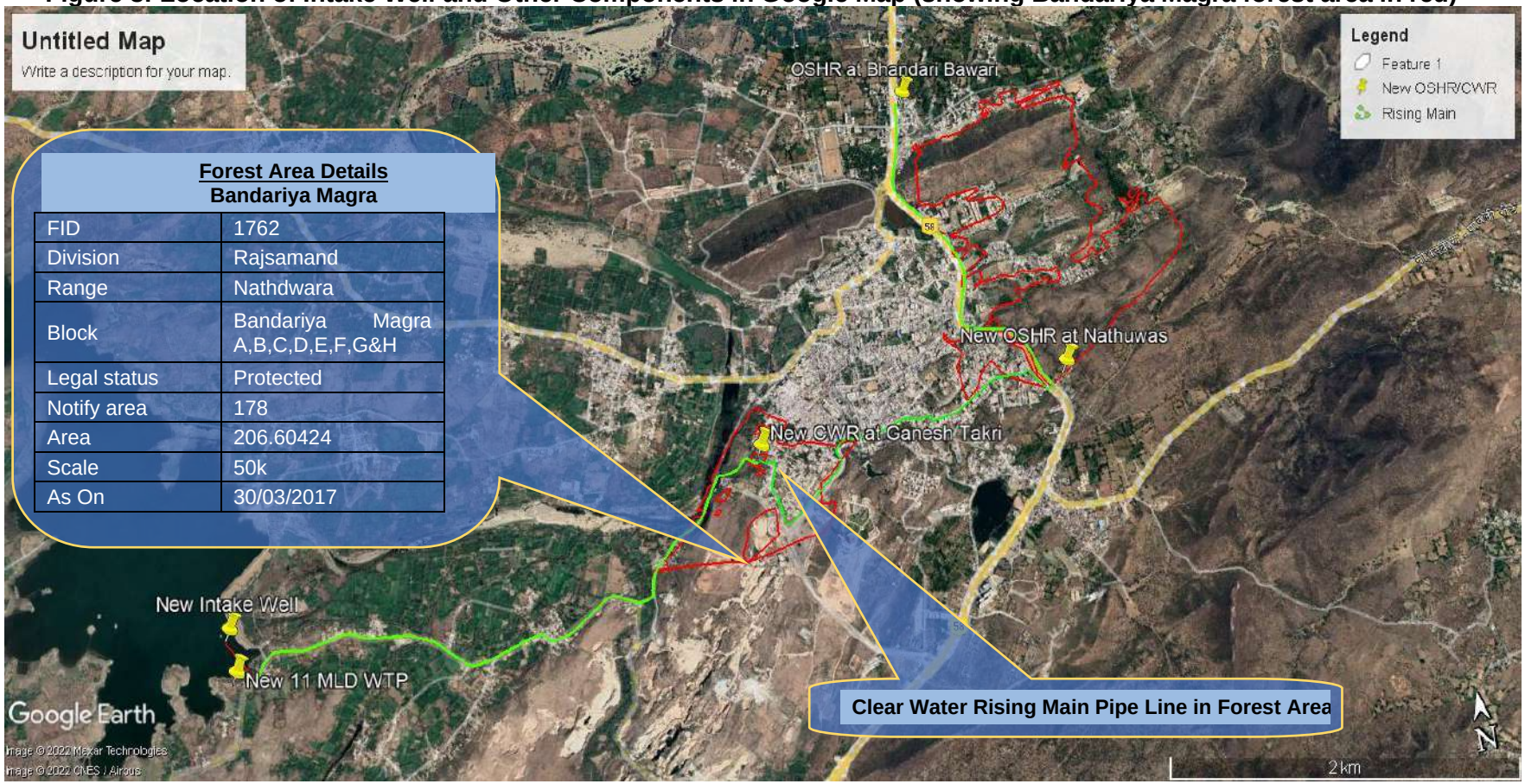


Figure 3: Location of Intake Well and Other Components in Google Map (showing Bandariya Magra forest area in red)



Forest Area Details
Bandariya Magra

FID	1762
Division	Rajsamand
Range	Nathdwara
Block	Bandariya Magra A,B,C,D,E,F,G&H
Legal status	Protected
Notify area	178
Area	206.60424
Scale	50k
As On	30/03/2017

Figure 4: Location of proposed WTP and CWR in Google Map

Figure 5: Location of Proposed GSLR site at Ganesh Tikeri on Google Earth

Figure 6: Location of Proposed OHSR site at Nathuwas on Google Earth

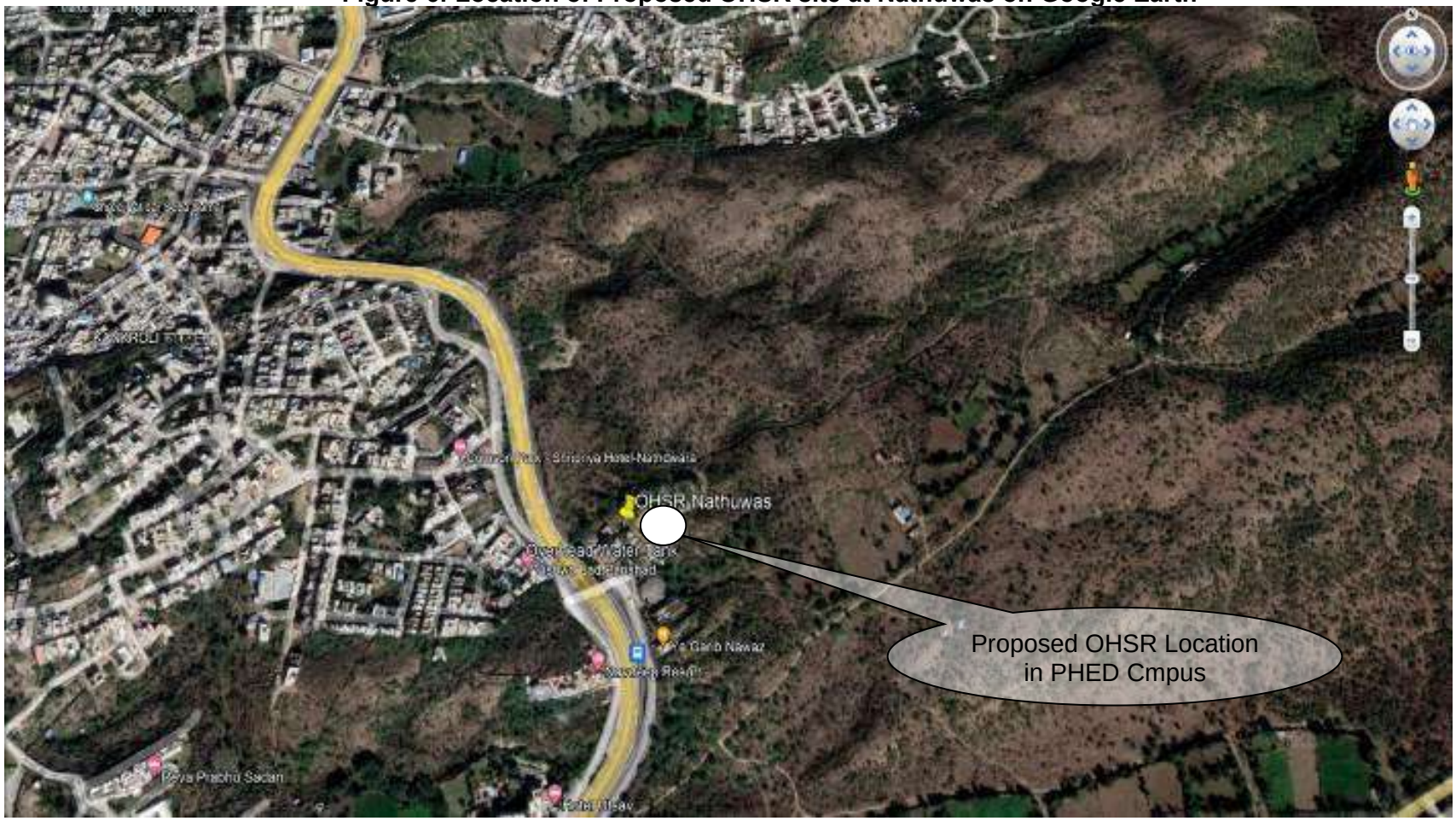
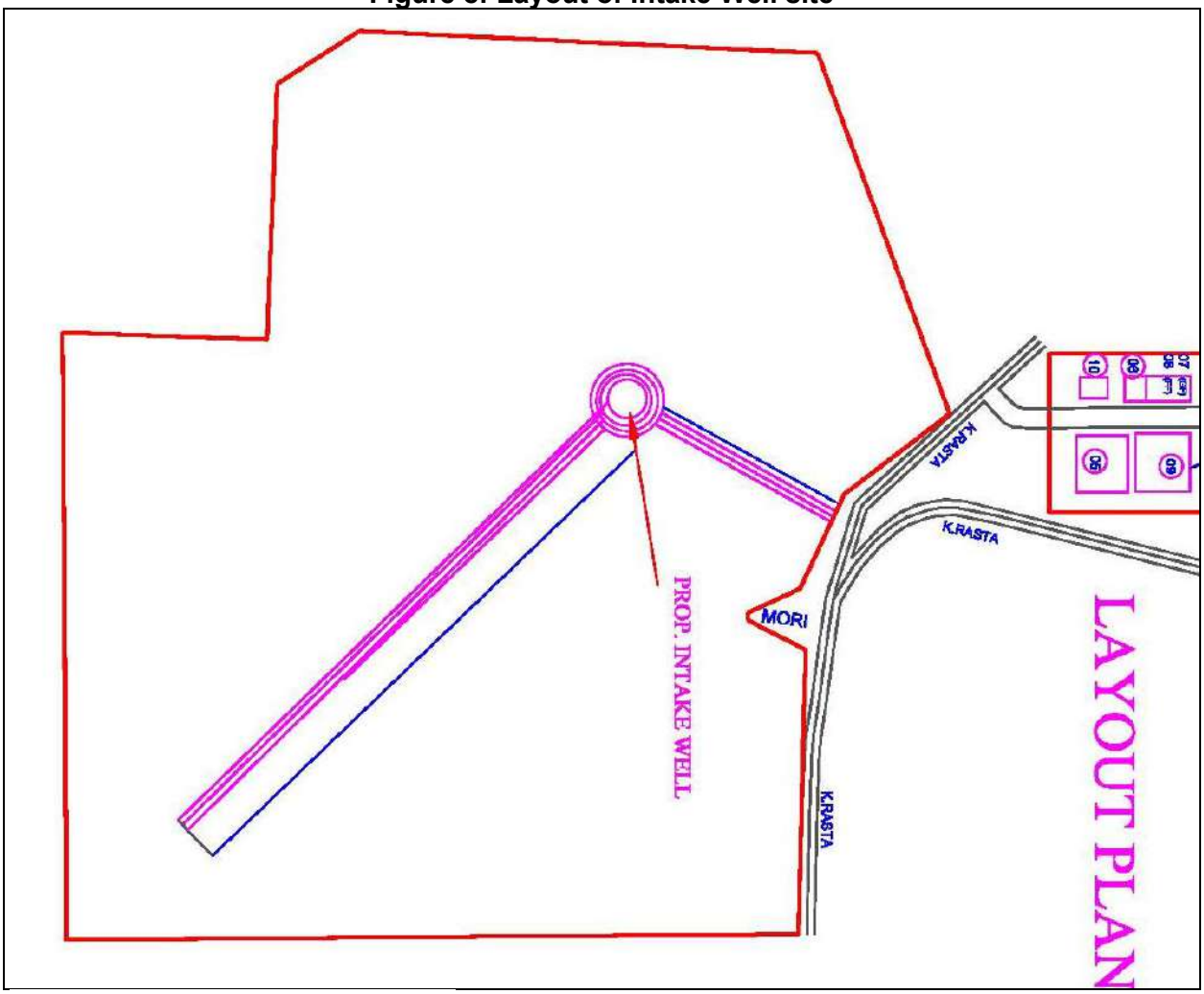


Figure 7: Location of Proposed OHSR site at Bhandari Baori on Google Earth

Figure 8: Layout of Intake Well site



1	APPROCH CHANNEL
2	INTAKE WELL
3	INTAKE WELL PUMP HOUSE
4	APPROCH BRIDGE
5	TRANSFER DG AREA
6	METERING ROOM
7	Mcc room (FF)
8	Control Room (FF)

Figure 9: Layout of proposed WTP

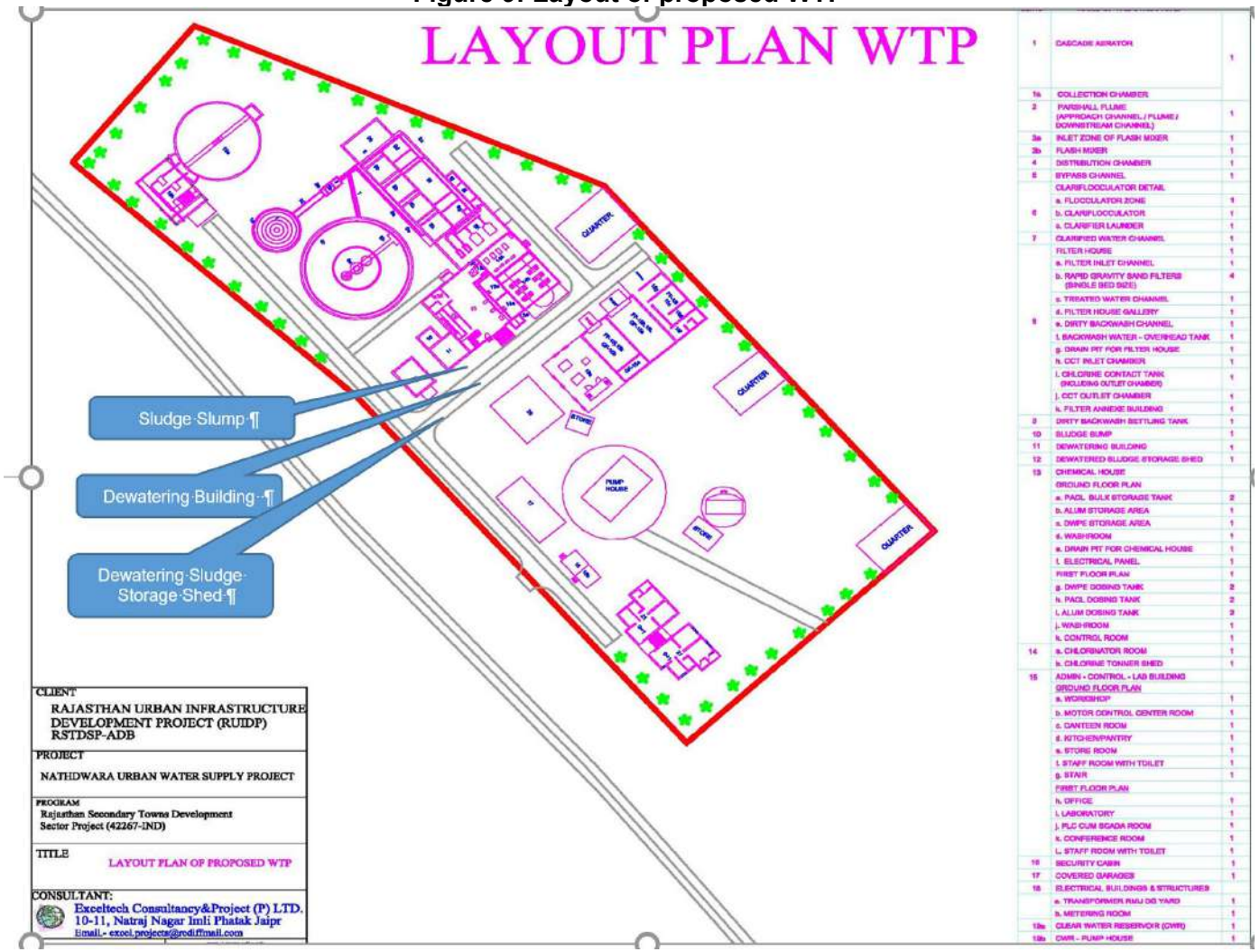
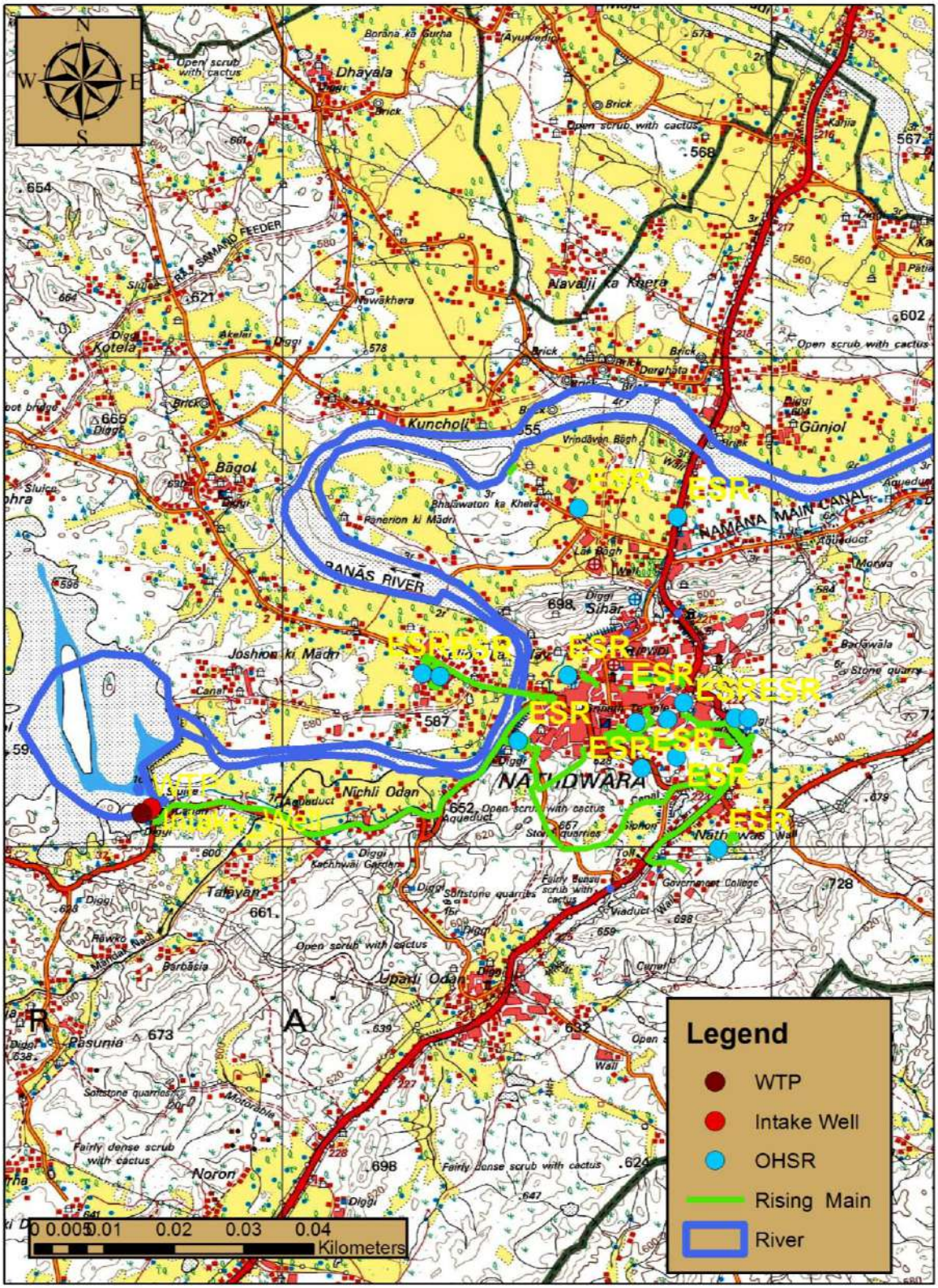


Figure 10: Srinath Ji Temple and Pipe Laying in nearby location of Temple

Figure 11: All Components proposed in Nathdwara Town in SOI Toposheet



2. Subproject Benefits

25. The subproject is primarily designed to improve environmental quality and living conditions of Nathdwara through provision of water supply. The benefits arising from this subproject include: (i) increased availability of potable water at appropriate pressure round the clock to all households including urban poor; (ii) reduced time and costs in accessing alternative sources of water. (iii) better public health particularly reduction in waterborne and infectious diseases; and (v) reduced risk of contamination of treated water supplies.

E. Implementation Schedule

26. Subproject is proposed for implementation under DBO modality, wherein which the successful bidder will design the water supply systems its 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 Nathdwara Municipality. Therefore, at this stage, subproject is designed only in outline, and the details of components of the subproject 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 above section, and the IEE will be further updated during the detailed design phase.

27. After the completion feasibility study /preliminary designs, bids were invited in June 2022 for the subproject to be implemented under the DBO (design-build-operate) modality. After evaluation of bids, LOA was issued on 04 November 2022 and thereafter work is awarded. Project completion period is 3 years. After completion of construction and commissioning, scheme will be operated by DBO contractor for 10 years, and after which the O&M will be carried out by ULB.

III. ANALYSIS OF ALTERNATIVES

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

29. The designed water supply subproject component in Nathdwara town include, water conveyance, storage and distribution. Descriptions of various alternatives considered for critical components such as water source and location, are presented in the following **Table 6**.

Table 6: Analysis of Alternatives

	Project Need – No Project Alternative
Type of alternative	No Project alternative
Description of alternatives	Nathdwara subproject is designed to improve the service level of basic infrastructure-water supply, which will ultimately improve At present, an intermittent water supply system is running in the town with actual service level 70-80 LPCD at consumers' end, which will improved to 135 LPCD after full commissioning of proposed water supply works under RSTDSP. At present water is supplied once in a day for 1-2 hours. After commissioning of this project, water will be provided 12m Head with continuous supply.

	The project intends to provide following benefits to the town population, and the "no project" alternative will deprive people of these benefits: increased availability of potable water at appropriate pressure to all households including urban poor; reduced time and costs in accessing alternative sources of water. better public health particularly reduction in waterborne and infectious diseases; reduced risk of groundwater depletion;
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 district 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, 'with project' alternative is considered appropriate
	Alternative source of water
Type of alternative	'Water source'
Description of alternatives	**Surface Water:** As detail provided by PHED Nathdwara, presently 150 McFt water is reserved for Nathdwara urban water supply (allocation letter is attached as **Appendix 5**), as per design for 2055, 143.2 McFt water is required from Nand Samand dam i.e. just 20% of dams' live storage. The Nand Samand dam have sufficient capacity for supply of water to town.
Selected Alternative	Selected source: Surface water from Nand Samand Dam
	Selected Alternative Locations
Type of alternative	Locations
Description of alternatives	Location of designed Infrastructure: The location of designed Clear Water Reservoirs (CWRs) is existing PHED campus at WTP at Nand Samand Dam and another at PHED. Campus. Adequate land is available for designed work. Selective alternative are proposed on PHED land and no new acquisition is required for the project .
Selected	**Intake Well and Pump House at Nand Samand dam -** Proposed dam is in the possession of Water Resource Department (WRD) of Govt. of Rajasthan. Sufficient space is available in dam for the construction of intake well and pump house. **Location of Pump House, WTP, CWRs and OHSRs**. All the proposed components 1 WTP, 2 CWRs, 2 OHSRs and pump houses are proposed within the existing PHED campuses as per . There are sufficient vacant lands available for the construction of these structures at these locations. Therefore no alternative locations are required to be considered for construction of these structures. Transmission line. Approx. 1700 m length of proposed new rising main pipe laying is passing forest area in the Nathdwara Town. This proposed rising main pipe laying is passing along the exiting rising main pipe laying site which is laying along the village road and Haldi Ghati Road ROW. There is no alternative any other short route for pipe laying due to presence of hilly region. Due to the proposed new rising main pipe, laying along the existing rising main pipe line in the ROW of Road there will be: less forest area diversion, very less number of trees to be impacted, required less amount of hill cutting and total length of this route will be less than other alternative route. The proposed rising main pipe laying is

	passing through hilly region therefore required hilly cutting, private land aquation and forest area diversion will be more than present proposed route alignment. **Water distribution lines**. water supply pipes are proposed along the roads/streets in the town within the road right-of-way (ROW). In wider roads water pipes will be laid in the road shoulder beside the tarmac, and in narrow roads, where there is no space, pipes will be laid in the road carriage way by break opening the tarmac. There are existing asbestos cement pipes underground in the existing water supply networks, the alignment will be fine-tuned during the detailed design, to avoid existing AC pipe alignments as far as possible.

IV. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORKS

A. ADB Safeguard Policy

30. 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.

31. **Screening and Categorization with that of ADB SPS 2009**. 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 designed 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 designed 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 designed 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 designed 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 designed project is classified as category FI if it involves investment of ADB funds to or through a FI.

32. The environmental impacts of Nathdwara water supply subproject have been identified and assessed as part of the planning and design process. An environmental assessment using ADB's Rapid Environmental Assessment Checklist for water supply (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.

33. **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.

34. **Environmental Audit of Existing Facilities.** ADB SPS 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.

35. **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 Project Management Unit (PMU) during project implementation upon receipt.

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

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

38. **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.

[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

39. **Unanticipated Environmental Impacts.** Where unanticipated environmental impacts become apparent during subproject implementation, ADB SPS 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.

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

41. **Community Health and Safety.** ADB SPS 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.

42. **Physical Cultural Resources.** Borrower is responsible for siting and designing the subproject to avoid significant damage to physical cultural resources. ADB SPS 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 designed 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.

43. **ADB SPS International Best Practice Requirements.** ADB SPS requires that, during the design, construction, and operation of the project, the executing agency shall apply pollution prevention and control technologies and practices that are consistent with international good practice, as reflected in internationally recognized standards. 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 designed alternatives that are consistent with the requirements presented in ADB SPS.

[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.

B. National Laws

44. 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.

45. **Environmental assessment**. The GoI EIA Notification of 2006 (replacing the EIA Notification of 1994), sets out the requirement for Environmental Assessment in India. This states that Environmental Clearance (EC) 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.

46. **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.

47. **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.

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

49. **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-7.**

C. Environmental Regulatory Compliance

50. **Table 7** presents a summary of environmental regulations and mandatory requirements applicable to Nathdwara Water Supply subproject.

Table 7: Applicable Environmental Regulations

Acts/ Laws/ Rules	Description	Requirement	Relevance to Project Phase
EIA Notification, 2006	The EIA Notification of 2006 set out the requirement for environmental assessment in India. Environmental Clearance is required for certain defined 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. Categories A projects require Environmental Clearance from the Ministry of Environment Forest and Climate Change (MoEF& CC). Category B projects require Environmental Clearance from the State Environmental Impact Assessment Authority (SEIAA).	None of the components of this subproject falls under the ambit of the notification. No EIA study or environmental clearance required.	-
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 including And Rajasthan Environment Mission and Climate Change Agenda for	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	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.	All phases of project

Acts/ Laws/ Rules	Description	Requirement	Relevance to Project Phase
Rajasthan (2010-14)	address the key environmental issues: water resources, desertification and land degradation, forest and biodiversity, air quality, climate change: adoption and mitigation, mining, industry, tourism, energy, urban development, etc. - Establishment of Environment Mission under the chairpersonship of the Chief Minister and a Steering Committee under the chairpersonship of Chief Secretary, Government of Rajasthan Tasks force set up for six key areas	Under water sector, major concerns, as the policy notes, are huge water losses and wastage, declining water availability, pollution. Relevant recommendations for the project include control of losses, integrated water resources management, control of raw water pollution[18], reuse and recycling. Avoid/minimize use of forest lands. With reference to climate change adoption and mitigation following should be considered in the project: (i) diminishing flows in surface water bodies, and groundwater depletion, and revival traditional water bodies as water sources (lakes/tanks); (ii) equal stress on demand side management in water; and (iii) minimize energy use - design energy efficiency systems.	
Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments (1987)	Act was enacted to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water, by Central and State Pollution Control Boards and for conferring on and assigning to CPCB/SPCBs powers and functions relating to water pollution control. Control of water pollution is achieved through administering conditions imposed in consent issued under provision of the Water (Prevention and Control of Pollution) Act of 1974. These conditions regulate the	Consent to Establish (CTE) before start of construction works and Consent to Operate (CTO) before start of operation of proposed WTP (11MLD) will be required All relevant forms, prescribed fees and procedures to obtain the CTE and CTO can be found in the RPCB website:(*http://environment.rajasthan.gov.in*)	Construction and operation

Acts/ Laws/ Rules	Description	Requirement	Relevance to Project Phase
	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 Pollution Control Board (RPCB) 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 RPCB 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 RPCB: (i) Diesel generators (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 RPCB website:(*http://environment.rajasthan.gov.in*)	Construction
Biodiversity Act of 2002	This Act primarily addresses access to genetic resources and associated knowledge by foreign individuals, institutions or companies, to ensure equitable sharing of benefits arising out of the use of these resources and knowledge to the country and the people.	Not Applicable	-
Wildlife Protection Act, 1972 and amendment 1991	This overarching Act provides protection to wild animals, birds, plants and matters connected with habitat protection, processes to declare protected areas, regulation of wildlife trade, constitution of state and national board for wildlife, zoo	Not applicable – none of the project components are located in or near protected areas.	Construction

Acts/ Laws/ Rules	Description	Requirement	Relevance to Project Phase
	authority, tiger conservation authority, penalty clauses and other important regulations.		
Forest (Conservation) Act, 1980	The Forest (Conservation) Act prohibits the use of forest land for non-forest purposes without the approval of Ministry of Environment Forests and Climate Change (MoEFCC), Government of India	Applicable; Forest diversion permission will be required. Approx. 1700 m length of proposed new raising main line from CWR Nand Samand Dam to Gaesh Takri and Ganesh Takri to Nahuwas OHSR along with Haldi Ghati road is passing through Bandariya Magra forest block. 1250 sqm (for length 1700m X width 0.75 m) of forest area required forest diversion	Pre-Construction.
Environment (Protection) Act, 1986 and 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.,	These are rules/notification that have been brought out under this Act, which are relevant to RSTDSP and are list below	Construction and Operation
Indian Drinking Water Standards	Gives details of the permissible and desirable limits of various parameters in drinking water as per the Bureau of Indian Standards	**Appendix C-1** provides drinking water standards	Construction and operation
Environmental Standards (ambient and discharge).	Emissions and discharges from the facilities to be created or refurbished or augmented shall comply with the notified standards	**Appendix C-2** provides applicable standards for ambient air quality. **Appendix C-3** provides Emission Limits for New DG Sets **Appendix C-4** provides Stake Height Requirement for DG Sets Contractor is also required to keep all his vehicles	Construction and Operation

Acts/ Laws/ Rules	Description	Requirement	Relevance to Project Phase
		maintained and control all the construction activities so that ambient air quality remains within prescribed limit.	
Noise Pollution (Regulation and Control) Rules, 2000 amended up to 2010.	Rule 3 of the Act specifies ambient air quality standards in respect of noise for different areas/zones.	**Appendix C-7** provides applicable noise standards and noise limit for diesel generators	Construction and Operation
Solid Waste Management Rules, 2016	**Responsibility of Solid Waste Generator** (i) 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; (ii) store separately construction and demolition waste, as and when generated, in his own premises and shall dispose off as per the Construction and Demolition Waste Management Rules, 2016; and (iii) No waste generator shall throw, burn or burry the solid waste generated by him, on streets, open public spaces outside his premises or in the drain or water bodies.	Contractor to follow all the rules during construction works	Construction and Operation
Construction and Demolition Waste Management Rules, 2016	Every waste generator shall segregate construction and demolition waste and deposit at collection centre or handover it to the authorized processing facilities Shall ensure that there is no littering or deposition so as to prevent obstruction to the traffic or the public or drains. Large generators (who generate more than 20 tons or more in one day or 300 tons per project in a month) shall	Construction waste shall be collected at stockpile area for 8-10 days and will be sent to disposal site. Disposal site shall be identified and allotted by Nagar Palika 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

Acts/ Laws/ Rules	Description	Requirement	Relevance to Project Phase
	submit waste management plan and get appropriate approvals from the local authority before starting construction or demolition or remodeling work, Large generators shall have environment management plan to address the likely environmental issues from construction, demolition, storage, transportation process and disposal/ reuse of C & D Waste. Large generators shall segregate the waste into four streams such as concrete, soil, steel, wood and plastics, bricks and mortar, Large generators shall pay relevant charges for collection, transportation, processing and disposal as notified by the concerned authorities;	Sludge or any material if classified as hazardous waste / material is to be handled and disposed according to this Rules	
Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016,	Responsibilities of the occupier for management of hazardous and other wastes.- (1) For the management of hazardous and other wastes, an occupier shall follow the following steps, namely:- (a) prevention; (b) minimization; (c) reuse, (d) recycling; (e) recovery, utilization including co-processing; (f) safe disposal. (2) The occupier shall be responsible for safe and environmentally sound management of hazardous and other wastes. (3) The hazardous and other wastes generated in the establishment of an occupier shall be sent or 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	Contractor to comply all the requirements of this Act during construction works. There are asbestos cement (AC) in the existing water supply system. As per these Rules, any waste with asbestos concentration limit exceeding 10,000 mg/kg (i.e. 1%), and is in the form of friable, powdered or finely divided state, is classified as hazardous waste. As per Bureau of Indian Standards (BIS), "AC pipes generally contain about 10-15% asbestos fibers in a cement matrix that comprises the rest of the materials and are termed as locked in asbestos products as these products have the asbestos fibers bound in	Construction and operation

Acts/ Laws/ Rules	Description	Requirement	Relevance to Project Phase
	intends to get its hazardous and other wastes treated and disposed of by the operator of a treatment, storage and disposal facility shall give to the operator of that facility, such specific information as may be needed for safe storage and disposal. (6) The occupier shall take all the steps while managing hazardous and other wastes to- 6 (a) contain contaminants and prevent accidents and limit their consequences on human beings and the environment; and (b) provide persons working in the site with appropriate training, equipment and the information necessary to ensure their safety.	cement. There is very little possibility of generation of airborne asbestos fibers during any reasonable handling, storage, and use of such products. However, during storing and installation, recommended work practices shall be followed to avoid harmful exposure". No AC pipes are proposed, existing AC pipes will be left as it is. However, stored AC pipes may have to removed / handled, and if such waste pipes confirm to the provisions of this act, waste shall be treated as hazardous waste and disposed as per the rules.	
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.	
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).	Badshahi Bagh and Rakt Talai are two ASI protected monuments/ sites in Khamnor village of Nathdwara tehsil, having 6-7 km distance from proposed subproject components. During confirmatory survey impact assessment will be required on these monuments due to proposed construction works and if any of the proposed components are coming under related or prohibited zones, permission from ASI will be required.	Construction

Acts/ Laws/ Rules	Description	Requirement	Relevance to Project Phase
		In case of chance finds, the contractors/PIU will be required to follow a protocol as defined in the Environmental Management Plan (EMP).	
The Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961; the Rajasthan Monuments, Archaeological Sites and Antiquities (amendment) Act 2007	Any construction/excavation work in the 'protected area' (as declared by GoR under the Act) requires priori permission of Department of Archeology and Museums -Application under the Rules shall be submitted to Director, State Archeological Department, at least 3 months prior to the work. Department provides conditional permission, including time for completion, procedures to be followed during the work and for chance finds etc.	Not applicable - there are no any state protected monuments in the town In case of chance finds, the contractor/ PIU will be required to follow a protocol as defined in the Environmental Management Plan (EMP) Charbhuja Temple Khamnor and Durga Mandir Unwas are nearest state protected monument about 9 km form proposed components in eastern direction in Nathdawa tehsil..	Construction
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-	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	Construction

Acts/ Laws/ Rules	Description	Requirement	Relevance to Project Phase
	Safe access to site and workplace Safety in demolition works Safety in use of explosives Safety in operation of transporting equipment and appoint competent person to drive or operate such vehicles and equipment Safety in lifting appliance, hoist and lifting gears Adequate and suitable lighting to every workplace and approach Prevention of inhalation of dust, smoke, fumes, gases during construction works and provide adequate ventilation in workplace and confined space Safety in material handling and stacking/unstacking Safeguarding the machinery with flywheel 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 m 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	motors Section 81- lifting and carrying of weight Section 82- H andS 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 tunneling Chapter XX- ladders and step ladders Chapter XXII- structural frame and formworks Chapter XXIV- medical facilities and first aid box	
Contract Labor (Regulation and Abolition)	Provides for welfare measures to be provided by the Contractor to contract labor and in case the Contractor fails	Applicable to all construction works in the project Principle employer	Construction and operation

Acts/ Laws/ Rules	Description	Requirement	Relevance to Project Phase
Act, 1970; The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979	to provide, the same are required to be provided by the Principal Employer by Law.The principal employer is required to take Certificate of Registration and the Contractor is required to take a License from the designated Officer. The Act is applicable to the establishments or Contractor of principal employer if they employ 20 or more contract labor. The inter-state migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home up to the establishment and back, etc.,	(RUDSICO-EAP) to obtain Certificate of Registration from Department of Labour, as principle employer Contractor to obtain license from designated labor officer Contractor shall register with Labor Department, if Inter-state migrant workmen are engaged Adequate and appropriate amenities and facilities shall be provided to workers including housing, medical aid, traveling expenses from home and back, etc., **Appendix C-12** provides applicable labor laws including 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 shall 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

Acts/ Laws/ Rules	Description	Requirement	Relevance to Project Phase
IS 11768: 1986/2005: Recommendations for disposal of asbestos waste material	The standard emphasis that every employer who undertakes work which is liable to generates asbestos containing waste, shall undertake adequate steps to prevent and /or reduce the generation of airborne dust during handling, storing, transportation and final disposal of final disposal of asbestos and asbestos containing products.	The crux is waste avoidance: the practice inculcated should focus the on minimal waste generation. Waste Collection: In the project circumstance, the waste is referred to the damaged powered asbestos which will be collected in the Permissible plastic bags to be disposed to the nearest TSDF facilities.	Construction
IS 12081: Pictorial Warning to be implemented on equipment containing Asbestos Contaminated Products.	The objective of the caution is to make the person handling to take all pre-cautionary measures and make them aware of all the possible risl	The following signs and personal protective equipment shall be used in handling ACM.  	Construction
IS 11451: Safety and Health Requirements related to Occupational Exposure to Asbestos contaminated Products.	This standard details the occupational exposure allowable and safety at work place to be enforced.	In the project the norms pertaining to limiting number of hours working with ACM will be 8.0 hrs/48 hrs a week and the medical examination has to be periodic, the environmental monitoring has to be done as per the protocol. The safety at work place shall be	Construction

Acts/ Laws/ Rules	Description	Requirement	Relevance to Project Phase
		enforced.	
IS 11768: Waste Disposal Procedure for Asbestos Containing Products.	The protocol pertaining to disposal of the waste is emphasized.	The collection of ACM powered will be in permissible plastic bags, which will be twisted tight at the neck so that the wear and tear due to abrasion will be minimum and the transportation of the asbestos waste has to be done by the authorized vendor to the approved landfill site.	Construction
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.	Applicable; Some part of Rising main pipe line which connect Nansamand WTP to Nathuwas CWR and Nathuwad CWR to Ganesh Takri GSLR, is passing through protected forest area, therefore forest diversion will be required.	Construction
International Conventions and treaties			
Ramsar Convention, 1971	The Ramsar Convention is an intergovernmental treaty that provides the framework for national action and international co-operation for the conservation and wise use of wetlands and their resources. India is one of the signatories to the treaty. The Ramsar convention made it mandatory for the signatory countries to include wetland conservation in their national land use plans.	There are no Ramsar Site in or near Nathdwara Town. Not applicable to Nathdwara Water Supply subproject.	-
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-	Not applicable in this project as no ODS are involved in construction works	-

Acts/ Laws/ Rules	Description	Requirement	Relevance to Project Phase
	depleting substances (ODS), while recognizing differences in a nation's responsibilities. Ozone depleting substances are divided in two groups Chlorofluorocarbons (CFCs) and Hydrochlorofluorocarbon carbons (HCFCs)		
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 any hazardous waste emerged during construction works Under this Convention, asbestos or asbestos waste in the form of dust and fibers is classified as hazardous waste.	-
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.	-

51. **Clearances / permissions to be obtained prior to start of construction. Table-8** 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 8: 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	Road cutting Permission from Nagar Palika and PWD (where applicable)	PIU
3	Establishment of construction camps	Allotment and approval for specific land use	Contractor
4	Construction of new WTP	Consent to establish and consent to operate under Water Act, 1974 from RSPCB	PIU & Contractor
5	Tree Cutting	State forest department/Revenue (Tehsildar)	PIU
6	Hot mix plants, Crushers, Batching plants and DG Set	Consent to establish and consent to operate under Air Act, 1981 from RSPCB	Contractor
7	Storage, handling and transport of hazardous materials	Hazardous Wastes (Management and Handling) Rules. 2016 Manufacturing, Storage and Import of Hazardous Chemicals Rules, 1989 from RSPCB	Contractor
8	Sand mining, quarries and borrow areas	Permission from District Collector/ State Department of Mines & Geology	Contractor
9	New quarries and borrow areas	Environmental clearance under EIA Notification 2006	Contractor
10	Use of vehicles and equipment	Pollution under control certificate (PUC) form RTO	Contractor
11	Temporary traffic diversion measures	Temporary traffic diversion measure including use of alternate road from District traffic police	Contractor
12	Use of highway ROW for construction area/ crossing	National Highway Authority of India	PIU
13	Rising main pipe laying	Forest diversion permission from Rajasthan Forest Department.	PIU and Contractor

52. 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 THE ENVIRONMENT

A. Physical Resources

1. Location, Area & Connectivity

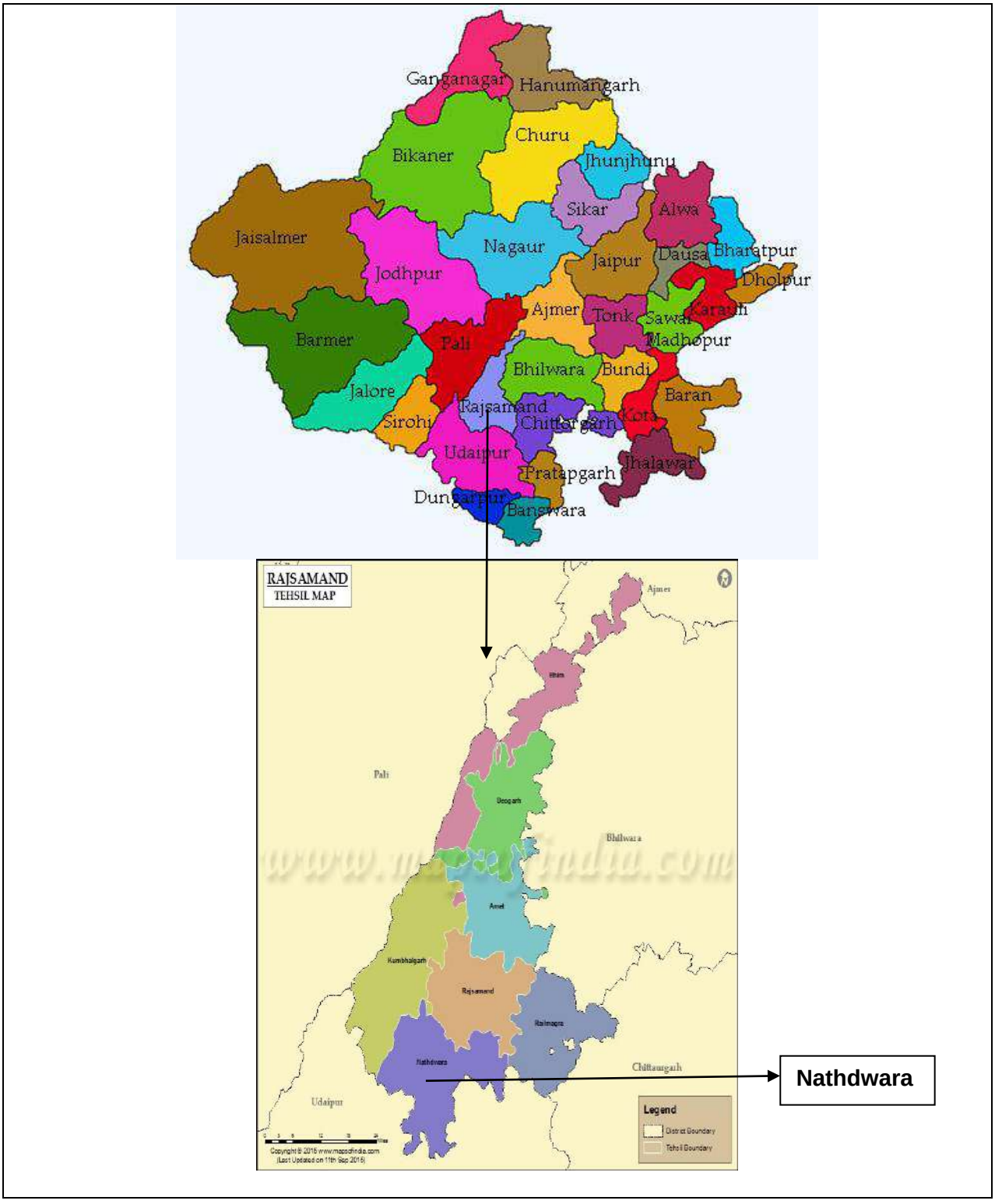
53. Nathdwara is a town in India's western state of Rajasthan. It is located in the Aravalli hills, on the banks of the Banas River in Rajsamand District, 48 kilometers north-east of Udaipur. This town is famous for its temple of Krishna which houses the deity of Shrinathji, a 14th-century, 7-year-old "infant" incarnation of Krishna. The deity was originally worshiped at Mathura and was shifted in the 1672 from Govardhan hill, near Mathura along holy river Yamuna after being retained at Agra for almost six months. Literally, Nathdwara means 'Gateway to Shrinathji'. Nathdwara is a significant Vaishnavite shrine pertaining to the Pushti Marg or the Vallabh Sampradaya or the Shuddha Advaita founded by Vallabha Acharya, revered mainly by people of Gujarat and Rajasthan, among others. Vitthal Nathji, son of Vallabhacharya institutionalized the worship of Shrinathji at Nathdwara.

54. Nathdwara town is located just 48 km north-east of Udaipur in Rajasthan and 18 km in south from Rajsamand and 350 kms away from Jaipur and 597 kms away from Delhi. This town is easily accessed by air, road or nearest rail-head.

55. Transportation: - Nathdwara is well connected to Delhi, Jaipur, Udaipur, Ahemdabad and Mumbai through National Highway 48. Nearest railway station is Mavali at 15 km distance and Udaipur at 48 km.

56. Nearest Airport – nearest Airport is Udaipur Airport which is about 80 km from Nathdwara. Airport has Connecting flights to Delhi, Mumbai and Jaipur. Location of Nathdwara Town in Rajasthan State map is shown in Figure 12.

Figure 12: Location of Nathdwara Town in Rajasthan State Map



2. Topography, Soils and Geology

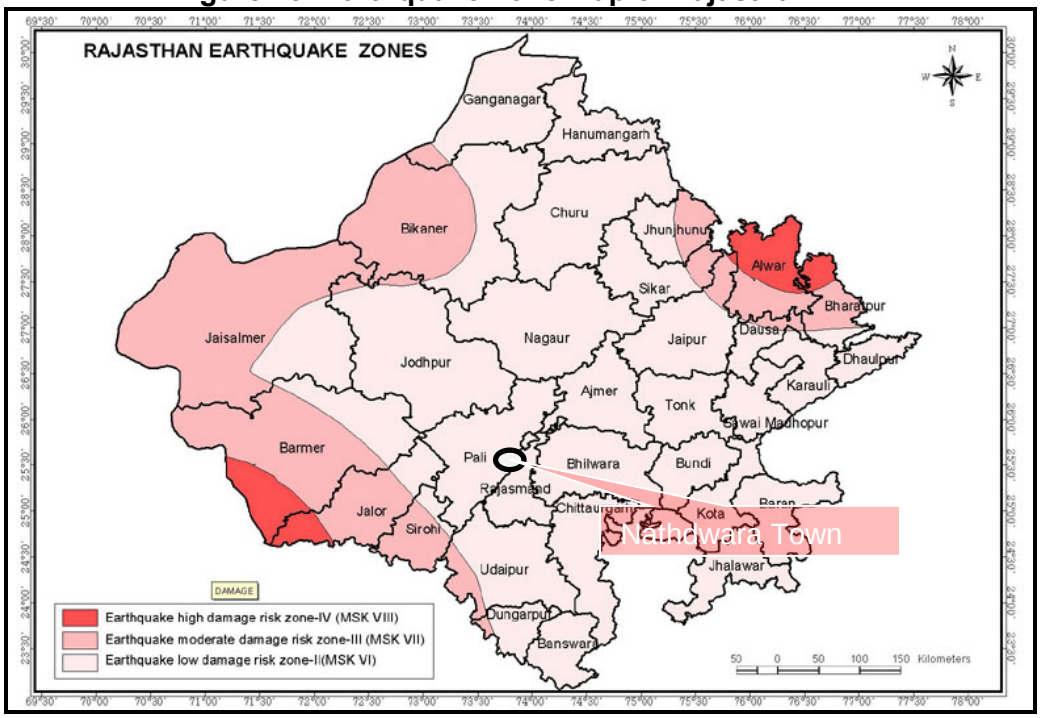
57. **Topography & Geology*:*** Nathdwara consists of monotonously rolling topography intersected by shallow valleys. Towards the western part of the district, Aravalli hills, a series of ridges run diagonally in the direction of NE and SW. The highest portion of Aravallis occurs south of Kailwara near Kumbhalgarh fort with an altitude of 1293 m amsl. A typical gneissic plain bearing irregularly carved off gneisses and granites without any alluvial cover is observed to the highest altitude of above 600 m amsl. The central and eastern parts of the district are relatively plain forming the foot hill part of Aravalli ranges. This plain gently slopes towards the east and northeast. In the higher and more rugged part towards the western side, alluvium is scanty whereas in the eastern flank, the alluvium is more continuous and reasonably thick. Geomorphological, there are intermontane plateaus, structural hills, pediment, buried pediment, aggradation plains, denudational plains, valley fills, flood plains etc. Geomorphological units show linearity specially the structural hills which are aligned in the direction of Arravallis (NE-SW).

58. ***Soils:*** The soils of the Nahdwara are mainly lithosols in the western part on slope and some inceptisols as per topography. Black loam soil is very useful for fertility of the crops.

Seismology

59. Many parts of the Indian subcontinent have historically high seismicity. Seven catastrophic earthquakes of magnitude greater than 8 (Richter scale) have occurred in the western, northern and eastern parts of India and adjacent countries in the past 100 years. Approx. 59 % of the land area of India is liable to seismic hazard damage. In India, seismic zones are divided into four zones i.e., V, IV, III and II. As per the seismic zoning map of India, Nathdwara town falls under the Zone II, which is the lowest earthquake risk zone in India. This zone is termed as “low damage risk zone”. Hence the risk of earthquake at the proposed sites is minimal and so the site is safe. Earthquake Zone Map of Rajasthan is shown in **Figure 13**.

Figure 13: Earthquake Zone Map of Rajasthan



3. Climatic Conditions

60. The district experiences arid to semi-arid type of climate. The winter season sets in after about the middle of November, when both day and night temperatures begin to drop steadily up to the month of January. January is the coldest month with mean daily minimum temperature of 7.8ºC. The day and night temperatures rise rapidly from February to May. May is the hottest month of the year with mean daily maximum temperature of 38.6ºC. When the southwest monsoon arrives in the district both day and night temperatures start decreasing appreciably. After the withdrawal of southwest monsoon there is a slight increase in day temperatures and a secondary maximum is obtained in the month of October. The night temperature, however, continues to fall gradually. The day temperature also starts falling in November.

61. The relative humidity is generally low except during southwest monsoon season. The highest relative humidity (81%) is recorded in the month of April. The summer season is the driest part of the year. Winds are generally light with some strengthening in the later half of summer and southwest monsoon season. During the period from May to September, winds blow from directions between south and west. In the post monsoon season, the winds are predominantly from direction between northwest and northeast. The potential evapotranspiration is highest in the month of May and lowest in December. Evapotranspiration is more than rainfall in all the months except in July and August.

62. **Rainfall:** Average rainfall of the Nathdwara is 554.5 mm whereas average annual rainfall has been lower than average annual rainfall and placed at 524.37 mm. Almost 93% of the total annual rainfall is received during the southwest monsoon which enters the district in the third or fourth week of June and withdraws in the mid of September. Drought analysis based on agriculture criteria indicates that the district is prone to mild and normal type of droughts. Occurrence of severe and very severe type of drought is very rare.

4. Surface Water

63. Nand Samand dam is constructed on Banas River in Tantol village and it is the main source of surface water for water supply in the Nathdwara Town. In the dam water is feed from Banas River in the rainy season. This dam is also known as Tantol Nandsamnd dam or a large pond because this dam is located near the Tantol village. The Banas is a seasonal river that dries up during the summer and its lies entirely within the state of Rajasthan. It's a tributary of the Chambal River, itself a tributary of the Yamuna, which in turn merges into the Ganga. The Banas is approximately 512 kilometres in length and its originates in the Veron ka Math situated in Khamnor Hills of the Aravalli Range. It flows northeast through the Mewar region of Rajasthan, then across Hadavati before meeting the Chambal near the village of Rameshwar in Sawai Madhopur District. The cities like Nathdwara, Jahazpur, and Tonk lie on the river. Major tributaries include the right bank tributaries of Berach and Menali and the left bank tributaries of Kothari, Khari, Dai, Dheel River, Sohadara River, Morel and Kalisil.

64. Samples of raw water and treated water at Nand Samand WTP were tested by PHED and test report shows that water quality of treated water is well within the permissible limits, except for total hardness which is slightly above desirable but well within permissible limits of Indian drinking water Standards and WHO's standards, test Results are given in **Table 9.**

5. Groundwater

65. Occurrence of ground water in the area is mainly controlled by the topographic and structural features present in geological formations. Ground water occurs mainly under water table conditions in all formations. Important water bearing formations besides alluvium are

gneisses, granites, schists, phyllites and limestone. In hard rock 5 formations, occurrence and movement of ground water is governed by foliation/bedding planes, fractures, joints solution cavities and other structurally weak planes. Weathered mantle of hard rocks yields good discharge of water. In alluvium, ground water occurs in interstices of unconsolidated sand and gravel. Locally semi confined conditions are encountered in both hard rock and alluvium. During pre-monsoon period (May, 2011), the depth to water level was recorded between 2.25 mbgl to 18.04 mbgl. During post-monsoon period, the depth to water level varied from 0.7 mbgl to 15.95 mbgl. The quality of ground water is potable in major part of the district. However, presence of excess fluoride, nitrate, iron and electrical conductivity in ground water has been reported from some pockets in the district. In the Nathdwara town, ground water quality in water supply is well within the permissible limits of Indian drinking water Standards and WHO's standards except for total hardness in surface water samples, slightly above desirable level. Ground water and surface quality results of water is given in **Table-9.**

6. Air Quality

66. Nathdwara being located in semi dry arid zone coupled with dust storms, especially during summer months, the particulate matter in ambient air is likely to be high. Traffic on the roads and winds are the main source of dust generation.

67. Ambient air quality in Rajasthan is monitored by Rajasthan Pollution Control Board. There is no ambient air quality station in Nathdwara (Rajsamand). Air quality monitoring shall be conducted in the pre-construction phase (SIP period) by the contractor and shall be updated in IEE.

68. **Noise Quality.** There are no industrial or heavy development activities in the municipal areas of Nathdwara town, therefore noise quality in town is almost good though due to vehicular movements noise is increased as compared to prescribed limits. DBO contractor is required to conduct noise level monitoring of Nathdwara; at prominent project sites, in the pre-construction phase and will update in IEE report.

Table 9: Raw and Treated Water Quality Test Report

National Standards for Drinking Water[a]			WHO Guidelines for Drinking-Water Quality, 4th Edition, 2011[b]	Raw Water Filter Nand Samand WTP (Untreated/Water quality of Nand Samand Dam)	CWR Filter Plant Nand Samand WTP (Treated)	CWR Imli Chock (Treated)	CWR Ganesh Tekari (Treated)	CWR Nathuwas (Treated)	TW Chopeta Bhag-1 (direct supply)	TW near Mahadev Mandir, Imli Chowk (direct supply)	OW No. 3 Imli Chowk (direct supply)	OW Tin Tiwari (direct supply)
Parameter	**Unit**	**Max. Concentration Limits[c]**										
Date of Sample												
Turbidity	NTU	1 (5)	-	12.3	4.1	4.3	5.6	5.3	-	-	-	-
pH		6.5 – 8.5	none	8.6	8.49	8.22	8.01	8.13	7.31	7.42	7.65	8.0
Color	Hazen units	5 (15)	none	---	---	---	---	---	-	-		-
Taste and Odor		Agreeable	-	---	---	---	---	---	-	-		-
TDS	mg/l	500 (2,000)	-	378	400	477	448	440	727	635	521	534
Iron	mg/l	0.3	-	---	---	---	---	---	-	-	-	-
Manganese	mg/l	0.1 (0.3)	-	---	---	---	---	---	-	-	-	-
Arsenic	mg/l	0.01 (0.05)	0.01	---	---	---	---	---	-	-	-	-
Cadmium	mg/l	0.003	0.003	---	---	---	---	---	-	-	-	-
Chromium	mg/l	0.05	0.05	---	---	---	---	---	-	-	-	-
Cyanide	mg/l	0.05	none	---	---	---	---	---	-	-	-	-
Fluoride	mg/l	1 (1.5)	1.5	---	---	---	---	---	0.31	0.33	0.39	0.38
Lead	mg/l	0.01	0.01	---	---	---	---	---	-	-	-	-
Ammonia	mg/l	0.5	none established	---	---	---	---	---		-	-	-
Chloride	mg/l	250 (1,000)	none established	110	120	160	120	120	190	150	120	130
Sulphate	mg/l	200 (400)	none	---	---	---	---	---	-	-	-	-
Nitrate	mg/l	45	50	3	3	3	3	3	15	26	24	28
Copper	mg/l	0.05 (1.5)	2	---	---	---	---	---	-	-	-	-
Total	mg/l	200 (600)	-	**210**	**220**	**260**	**220**	240	-	-	-	-

National Standards for Drinking Water[a]			WHO Guidelines for Drinking-Water Quality, 4th Edition, 2011[b]	Raw Water Filter Nand Samand WTP (Untreated/Water quality of Nand Samand Dam)	CWR Filter Plant Nand Samand WTP (Treated)	CWR Imli Chock (Treated)	CWR Ganesh Tekari (Treated)	CWR Nathuwas (Treated)	TW Chopeta Bhag-1 (direct supply)	TW near Mahadev Mandir, Imli Chowk (direct supply)	OW No. 3 Imli Chowk (direct supply)	OW Tin Tiwari (direct supply)
Parameter	**Unit**	**Max. Concentration Limits[c]**										
Date of Sample												
Hardness												
Calcium	mg/l	75 (200)	-	---	---	---	---	---	-	-	-	-
Zinc	mg/l	5 (15)	none established	---	---	---	---	---	-	-	-	-
Mercury	mg/l	0.001	0.006	---	---	---	---	---	-	-	-	-
Aluminum	mg/l	0.1 (0.3)	none established	---	---	---	---	---	-	-	-	-
Residual Chlorine	mg/l	0.2	5	---	---	---	---	---	-	-	-	-
E-coli	MPN/100 ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	---	---	---	---	---	-	-	-	-
Total Coliform	MPN/100 ml			---	---	---	---	---	-	-	-	-
									-	-	-	-

Source: PHED Regional Laboratory, Nathdwara (Report copy attached as Appendix 9)

B. Ecological Resources

69. The Rajasmand district has Mixed Miscellaneous types of Forests, which are mostly found in south eastern and eastern part of Rajasthan

70. These Forests mainly have Anogeissus pendula, Anogeissus latifolia, Terminalia tomentosa, Terminalia arjuna , Terminalia chebula, Albizia lebbeck, Dalbergia paniculate etc. and its associates.

71. **Flora.** The common flora of Nathdwara town is Mahua, Baheda, Saded, Aam and Jhinjha. The endemic taxa or species found in the district are represented by Papal, Bad or Banyan Tree Bael, Dhak, Kaith, Datura, Indrokdhav**.**

72. **Fauna. Common fauna of** Nathdwara town falls in Paleotropical – Oriental Region. The typical fauna of the Oriental region, includes House Rat, House sparrow, House crow, Rock Pigeon, Garden lizard, Indian fox, Hare, Common Mongoose, Five striped Palm Squirrel, Jungle Cat, Indian Porcupine, Common weaver bird, Common Babbler, Parakeets, Bulbul, Koel.

73. Forest and Wildlife Area: The proposed rising main near the Nathuwas OHSR and Ganesh Takri locations, is passing through Bandariya Magra Protected Forest Block, therefore forest diversion is applicable and will be taken after the joint site visit with Rajsamand District Office. Other than this forest block no wildlife areas falls within 10 radius of proposed components. The nearest protected areas is Kumbalgarh Wildlife Sanctuary at 35 km distance in north-west direction.

74. **BANDARIYA MAGRA**, Protected Forest located near Nathdwara in Rajsamand District, having area of 206.6 Ha. Typical flora and fauna of forest block mainly consist of following

Flora Species found of Bandariya Magra Forest blocks:-

75. Emblica officinalis, Acacia catechu, Azadirachta indica, Ficus religiosa, Tactona grandis, Acacia Arabica, Adina cordifolia, Dalbergia sissoo, Pongamia pinnata, Ricinus communis, Bauhinia sp. Aegle marmelos, Anogeissus latifolia, Sterculia urens, Logerstroemia parviflora, Ocimum sanctum.

Fauna Species of Bandariya Magra Forest blocks:

76. Rattus rattus, Passer domesticus, Columba livia, Hemidactylus flaviviridis, Vulpes benqalensis, Corvus splendens- House crow, Lepus nigricollis, Herpestes edwardsi, Funambulus pennant, Felis ehaus, Hystrix Indica, Ploceus philippinus, Turdoides caudatus, Psittacula krarneri, Pycnonotus cafer, Eudynamys scolopacea, Naja naja,

77. There is no hill or slope cutting is required for laying of rising main pipe laying work in the forest area. No tree cutting is envisaged from pipe laying work as pipeline will be laid within the Right of way of existing Haldi Hagti road.

78. Estimated forest land required diversion for 1700 m pipeline is 1250 sqm (0.75*1700 m). diversion of forest land will be applied after finalizastion of design by DBO contractor.

79. Although Nathdwara Town is situated on Aravalli Hill terrain. As per the Aravalli Notification 1992, Prior permission from is essential from MoEFCC for Infrastructures activities

proposed on Aravlli Hill under jurisdiction of Alwar and Gurgaon district boundaries only. The sub-project Activities “are proposed in Rajasamand district and no permission is required under Arawali Notification.

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

81. Biodiversity Assessment Report (IBAT Analysis) for Water Supply in Nathdwara town has been attached with this report as **Appendix 3.** The screening study for critical habitation indicates that within the area of analysis (AOA) there are no known species which would qualify the area as critical habitat under the set criteria (criterion 1–5, as presented in the report). As per IBAT report; within 50 km radius of WTP. There are 8 endangered and 6 critical rare and 21 vulnerable species of concern fauna listed as IUCN Red list, most of which are wild species and not reported in urban areas of Nathdwara. The nearest wildlife sanctuary is Kumbalgarh located 35 km from project town. Proposed activities will not have impact on these species. There is no national or international protected area within the periphery of 50 km. There is no key bio-diversity areas within the buffer of 1-10 km, however there are five key biodiversity area the buffer of 10-50 km.

C. Economic Development

1. Land use

82. Nathdwara Master Plan provides land use details of Nathdwara Town. Out of total 2213.15 acre area, 1093.54 acre is developed urban area. Rest of the land is under agricultural land, forest area, open land and reserved for reservoir. Details of the land use is provided in **Table 10** below-

Table 10: Existing Land Use of Nathdwara

S. No.	Land Use	Area (in Acres)	Percentage of Developed area (%)	Percentage of Urban area (%)
1	Residential	586.18	53.60	26.49
2	Business	62.32	5.70	2.82
3	Industrial	86.24	7.89	3.90
4	Govt. / Semi Govt.	31.68	2.90	1.43
5	Recreation	78.95	7.22	3.57
6	Public and Semi Public	130.97	11.98	5.92

S. No.	Land Use	Area (in Acres)	Percentage of Developed area (%)	Percentage of Urban area (%)
7	Transport, roads and Recirculation	117.2	10.72	5.30
	Developed Area	**1093.54**	**100.00**	
8	Agricultural area	283.73		12.82
9	Open land	283.7		12.82
10	Forest area	462.9		20.92
11	Water body	89.28		4.03
	Total Urban area	**2213.15**		**100.00**

*Source: Master Plan Nathdwara 2011-2031

2. Commerce, Industry & Agriculture

83. **Commerce**: Nathdwara is a important commercial centre and a very important pilgrimage. In last few decaded due to increase in number of pilgrims, there is continuous increase in commercial activities. Main markets of this town are Lal Bazar, Chaupati, New Bazar, Mandir Marg, Indira Bazar etc. New commercial area has been developed near current bus stand and near Rajsamand road. In Nathdwara, marble business is being developed on Rajsamand road.

84. **Industries:** In Nathdwara, there are total 52 small scale industries which include soap stone, chips crusher, stone crushing and polishing. In industrial structure, various small scale and cottage industries i.e., flour mill, jewelry work, Painting work, printing work, repair workshop etc. are present in the town.

85. **Agriculture:** Major agricultural crops found in the town are Rabi, Kharif and Jayad which consists Millet, Gram, Wheat, Mustard, Barley, Sesame, Urad, Groundwater, Cotton, and Sugarcane, Watermelon and cucumber and other vegetables.

Other Infrastructure

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

87. **Power Supply.** Distribution of power in the town is the responsibility of the Rajasthan State Electricity Board. Power is generated and supplied from Mahi Hydal Project, Banswara. Main electricity line is 186 kms away from the town. The major sector for electric consumption is domestic which constitute 14.53% small scale industries consume 2.48% of power.

88. **Transport.** 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 neighboring villages and towns and to larger towns farther afield, such as Jaipur, Chittorgarh, Ajmer, Rajsamand, Udaipur, with which there are good road connections. The rail line between Udaipur and Ahmadabad in Gujarat runs through the town,

NH-58 (Old No.NH-8) is passing though town and connect this town with other major city of Rajasthan. Socio Cultural Resources

3. Demography

89. As of the 2001 India census, Nathdwara had a population of 37,007. Males constitute 52% of the population and females 48%. Nathdwara has an average literacy rate of 73.0%, higher than the national average of 59.5%; male literacy is 80%, and female literacy is 65%. In Nathdwara, 13% of the population is under 6 years of age.

D. History, Culture and Tourism

90. The Nathdwara town is known for Shrinath Ji temple, The temple was built in the 17th century at the spot as exactly ordained by Shrinathji himself. The idol of the Lord Krishna was being transferred from Vrindaban to protect it from the Mughal ruler Aurangzeb. When the idol reached the spot at village Sihad or Sinhad, the wheels of bullock cart in which the idol was being transported sank axle-deep in mud and could not be moved any further. The accompanying priests realised that the particular place was the Lord's chosen spot and accordingly, a temple was built there under the rule and protection of the then Maharana Raj Singh of Mewar. Shrinathji Temple is also known as 'Haveli of Shrinathji. Shrinath Ji temple is neither under National Protected or nor be under state protected monument.

91. The nearest component of proposed water supply is water supply pipe laying to Srinath Ji temple at 30 m distance. The campus of this Srinath Ji temple is surround by the local city road and this road acts as transition zone between temple campus and local residential areas. The proposed water supply pipe laying is proposed in the surrounding areas and due to above road around the temple there is no direct impacts on Temple structure and its properties. Fair of Srinath Ji Temple is held on Shri Krishna Janmashatami festival and peak hour of the devotees are generaly morning and evening time, therefore at the time temple fair construction work will be avoid and safety measures will be followed.

92. Devotees throng to the temple in large numbers during occasions of Janmashtami and other festivals, like Holi and Diwali. The deity is treated like a living image, and is attended with daily normal functions, like bathing, dressing, meals called "Bhog" and the resting times in regular intervals. Since the deity is believed to be the infant Krishna, accordingly, special care is taken. The priests in all Havelis are Brahmins under Gurus who are the *kul* (descendants) of Vallabhacharya, the founder of this deity's image at Govardhan hill, near Mathura.

93. The main attractions are the Aartis and the *Shringar*, i.e. the dressing and beautifying of the deity of Shrinathji, which is changed seven times daily, treating it as a living person, adorning it with the appropriate dresses for the time of day or night. The intricately woven *shaneels* and silk cloth have original *zari* and embroidery work on them, along with large quantities of real precious jewelry. The formal prayers are offered with *diya*, incense sticks, flowers, fruit and other offerings, with local instruments and devotional songs of the Shrinathji, according to the demand of the time and occasion. The view of the deity after the *parda* (curtain) is removed is called *jhakh*

94. The charming city of Nathdwara literally suggesting “The Gateway to Lord” is nestled amidst the Aravalli ranges. Snuggled on the pristine banks of Banas River, the lively city of Nathdwara is located at a favorable distance of 48 km from Udaipur. This arresting city is known

for housing the Eklingji Temple dedicated to Lord Krishna. Apart from this, a cluster of ancient temples surrounds the city which appears to be the " Gateway to the Lord's Abode"

95. Apart from Srinath Ji temple there are other various tourist spots in nearby villages of nathdwara Town Viz. Haldighati, Maharana Pratap Memorial, Dwarkadheesh Temple, Charbhuja Temple, Molela Terracotta Village, Shri Eklingji Temple, Ranakpur Jain Temple, Kumbhalgarh Fort etc. Srinath Ji temple is only tourist spot which existed in the Project Town.

96. Rakt Talai is the last spot where the second half of the battle of Haldighati was fought between Maharana Pratap (A.D.1540-1597) and the Mughals. As a result, thousands of soldiers o on both sides were died and their blood flowed to such an extent that it formed a pool. The twin cenotaphs that stand to commemorate the exploits of Raja Ram Saha of Gwalior and his three sons who paid the debt of gratitude to their patron with their lives.

97. Badshahi Bagh is the area where Mughal army first set up their camp after realizing the difficulty in fighting along the neck of Haldighati.

98. Badshahi Bagh and Rakt Talai are two ASI protected monument in Khamnor village at 8-9 km distance at eastern side of town. Charbhuja Temple Khamnor and Durga Mandir Unwas are state protected monument about 9 km form Nathdwara in eastern direction.

E. Environmental Settings of Investment Program Component Sites

99. The subproject includes laying of water supply pipes and construction of structures in the municipal area of Nathdwara. Pipes for water supply will be laid along the roads/streets in the town within the road right of way (ROW). In wider roads 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. Roads in some part of the town are narrow. Roads are lined both sides with open drains. In narrow roads pipes will be laid in the middle of the road, which may affect the traffic. Bigger diameter strategic water mains 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 pipelines in those roads. Site environmental features of project are given in **Table 11:**

100. **Proposed 11 MLD WTP, 1500 KL CWR, Intake Well and Clear Water Pump House in PHED Campus nearby the Nand Samand Dam.** The proposed location is existed at adjoining of existing WTP on Nand Samand Dam on hilly terrain. The proposed site area is under ownership of PHED. There are one Eucalyptus and one Babul trees may be impacted from proposed construction. Tree cutting Permission has been taken from the concerned authority (Refer **Table 8**). No wildlife is reported at from the sites. No wildlife exists on this land.

101. **Location of 1500 KL OHSR, Nathuwas:** It has proposed in existing PHED campus in Nathuwas PHED campus. There are neither tree nor wildlife will be impacted.

102. **Location of 300 KL OHSR, Bhandari Bawari:** It has proposed in existing PHED campus in Bhandari Bawri PHED campus. There are neither tree nor wildlife will be impacted.

103. **Rising Main Pipe Laying:** Approx 1700 m length of proposed new raising main line from CWR Nand Samand Dam to Gaesh Takri and Ganesh Takri to Nahuwas OHSR along with Haldi Ghati road is passing through Bandariya Magra forest block. There is no tree cutting from new riainig main laying work because this laying is proposed along with roadside.

Table 11: Site Specific Environmental Features

S.No	Proposed Structure	Co-ordinate	Env. Sensitivity	Photo
1.	Intake Well and Pump House in Nanad Samand dam	Lat 24°55'15.01"N Long 73°46'45.30"E	• This proposed site is in nearby location (50 m far) of existing intake well. • Permission from WRD is under process (Letter to WRD is attached in appendix 5) • The nearest habitation is 120 m away from the proposed intake well. • The Proposed Intake well is approachable using village roads. • The proposed Intake well and pump house location is 2600 meters away from the nearest forest area Bandariya Magra Forest Blocks. • The nearby habitation to the WTP and CWR is 185 meters away.	 Proposes intake well site in Nand Samand Dam
2.	WTP and CWR with pumping station near existing WTP on Nand Samand Dam.	Lat 24°55'8.75"N Long 73°46'48.65"E	• The proposed location is existed at adjoining of existing WTP plant on Nand Samand Dam on hilly terrain. • The proposed site area is under ownership of PHED. • There are one Eucalyptus and one Babul tree that may be impacted from proposed construction. • There are one existing WTP at adjoining of proposed site, • The WTP and CWR are approachable through village roads. • The nearby habitation to the WTP and CWR is 185 meters away. • The proposed location is situated in west direction to Nathdwara city area. • The available and required government land at the location is 30000 m2 and is 5500 m2 respectively. • The Proposed WTP and CWR locations at	

<table>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nand Samand dam are 2500 meter away from the nearest forest area Bandariya Magra Forest blocks.
• The nearest habitant (3 nos.) at 160m distance.</td>
<td> 
Proposes site of WTP CWR and Pumping Station near existing WTP location</td>
</tr>
<tr>
<td>3.</td>
<td>Balancing 1500 KL OHSR at Existing OHSR Nathuwas PHED campus</td>
<td>
<table>
<tr><td>Lat</td><td>24°55'34.99"N</td></tr>
<tr><td>Long</td><td>73°49'51.88"E</td></tr>
</table>
</td>
<td>• The proposed sites are located behind the existing OHSR in the PHED campus in Nathuwas on NH-58.
• There will be no impacts on trees and wildlife.
• The available and required government land at the location is 1000 m^2 is 200 m^2 respectively.
• The nearby habitation from OHSR is at a distance of 85 meters.
• The site is connected with Udaipur Marg NH58 and located in south-east direction of Nathdawara city area.
• The proposed 1500 KL OHSR Nathuwas PHED campus is located adjacent to the boundary line of the Bandariya Magra Forest Block.</td>
<td> 
  </td>
</tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td><td>Proposed Site of Balancing 1500 KL OHSR at Existing OHSR Nathuwas PHED campus</td></tr>
<tr><td>4.</td><td>Balancing GSLR and CWR at Ganesh Takri.</td><td><table><tr><td>Lat</td><td>24°55'31.15"N</td></tr><tr><td>Long.</td><td>73°48'45.28"E</td></tr></table></td><td>This Site is situated in the PHED campus on Ganesh Takri in Ganesh Nagar, Nathdwara.
In the proposed PHED campus a 450 KL CWR is present that is in running condition.
The nearest habitation is Ganesh Nagar at 50 m far from the proposed site.
There are 2 nos. Palm and One Neem Tree that may be impacted from proposed components.
Shiv Shankar Statue/ Miraj is located in nearby location at approx. 400 distance in east direction.
This proposed location is located on hilly and undulating terrain and the south-east direction of Nathdwara city.
The nearby protected area is Kumbalgarh Wildlife Sanctuary at 35 km distance in north-west direction.
Proposed site of GSR/CWR at Ganesh Takri is approachable via Lambi Galli and Ganesh takri marg.
The proposed GSR/CWR reservoir at Ganesh Takeri is surrounded by Bandariya Magra Forest Blocks.
The available and required government land at the location is 4000 m^2 and is 1000 m^2 respectively.</td><td> 
 
Proposes site of GSLR/CWR at PHED headworks Ganesh Takri</td></tr>
</table>

5.	300 KL OHSR in existing PHED Campus at Bhandari Bawari on NH-58	Lat 24°56'36.05"N Long 73°49'31.08"E	• This Proposed OHSR site is existed near the existing outdated OHSR and office building. • These both structures are out of use. • There will be no tree and wildlife will be impacted. • There are existing PHED questers in which one or two families are lived. • This site is also on NH-58. • There are some residential and commercial shops in nearby locations. • The available and required government land at the location is 1000 m^2 is 100 m^2 respectively. • The nearby habitation from OHSR is at a distance of 85 meters. • This proposed site is in north direction from Nathdwara Town • The Proposed 300 KL OHSR in existing PHED campus Bhandari Bawari on NH58 is 270 meters away from nearest forest area Bandariya Magra Forest Block.	 **Proposed 300 KL OHSR in existing PHED Campus at Bhandari Bawari**
6.	9.400 km long DI K7 Transmission line	Transmission line to feed clear water from CWR to OHSRs.	• Total length of transmission line is approx. 9.400 km. • All feeding transmission lines are proposed along the local city roads where no tree will be impacted and no land acquisitions is required.	

7.	Clear Water Rising Main Pipeline	Start from WTP at Nandsmand Dam and it ends at Nathuwas after feeding water at Ganesh Takri	• Total proposed length is 7.150 km along the existing rising main pipe line. • Out of 7.150 km length of rising main, Approx. 1700 m length falls in the forest area where predominant tree cover spices are mainly *Acacia juliflora* and *Acacia nilotika*; • Sufficient space is available along the roads for laying of rising main pipe on both side of Haldighati Marg and Old NH-8 (Dehli-Mumbai Highway).	 

VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Introduction

104. Potential environmental impacts of the designed 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.

105. 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. During pre-construction stage site shall be made free from any of the environmental issues such as tree cutting, arrangement of required facilities etc. Site selection of construction work camps, stockpile areas, storage areas, and disposal areas & Site selection of sources of materials shall be done in pre-construction stage and all the required arrangements should be made in this stage.
(iv) Construction impacts include impacts caused by site clearing, earthworks, machinery, vehicles and workers. Construction site impacts include erosion, dust, noise, traffic congestion and waste production.
(v) O&M impacts include impacts arising from the operation and maintenance activities of the infrastructure facility. These include routine management of operational waste streams, and occupational health and safety issues.

106. 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).

107. 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.

108. The ADB Rapid Environmental Assessment Checklist has been used to screen the project for environmental impacts and to determine the scope of the IEE.

109. 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

110. **11 MLD WTP and 1500 KL CWR, in PHED Campus nearby the Nand Samand Dam:** The proposed location is existed at adjoining of existing WTP on Nand Samand Dam on hilly terrain. The proposed site area is under ownership of PHED. There are one Eucalyptus and one Babul trees may be impacted from proposed construction. Tree cutting Permission has been taken from the concerned authority (Refer **Table-8**). No wildlife is reported at from the sites.

111. **Location of 900 KL GLSR and CWR:** They have proposed in existing PHED campus on Ganesh Takari. There are 2 nos. Palm and One Neem Tree that may be impacted from construction of GLSR. Tree cutting Permission has been taken from the concerned authority (Refer **Table 8**). No wildlife is reported at from the sites.

112. **Intake Well and Pumping Motor in Nand Samand Dam.** It is proposed that intake will be constructed close to the existing intake structure in the dam. There is no notable aquatic life in the dam, and therefore there are no likely impacts. The gross storage capacity of the dam 21.225 MCM (749.6 mcft), that include live storage of 20.631 MCM (728.62 mcft) and 0.594 MCM (20.97 mcft) dead storage. This dead storage will not be abstracted, and will remain in the dam, except for the infiltration and evaporation losses. This dead storage therefore will support the propagation of aquatic life even during the lean season. Given no notable aquatic life, impacts due to entrapment and impingement of aquatic organisms during intake operation are negligible. Appropriate measures however will be implemented to avoid entry of aquatic organisms, if any, during intake operation. Construction works in the reservoir may lead degradation of water quality due to increase in turbidity and chemical contamination from fuels and lubricant used in construction work. Increase in silt content and water turbidity, chemical quality can affect the aquatic life, silting/chocking of spill ways/canals etc. Though there are no notable aquatic life, to ensure that any negative impacts are mitigation, appropriate measures such as the following shall be implemented:

(i) Do not utilize the dead storage for supply; ensure that dead storage is available in the dam all times;
(ii) Design inlet of intake pipe in the dam with appropriate screen to avoid entry of aquatic organisms into inlet;
(iii) Select a construction methodology that is least disturbing, and appropriate for the in-situ soil condition, and able to complete the construction work prior to onset of monsoon;
(iv) Schedule the construction works during low water level period–late winter months to pre monsoon (February–June/July); ensure that works are completed during the same period to prior to onset of monsoon;
(v) Erect temporary barriers to form enclosed construction area with least disturbance
(vi) Allow adequate time to settle the distributed solids to prior to pumping out water; only clear/clarified water shall be pumped back into the reservoir; any silt laden water should be pumped to a silt pond;
(vii) Avoid/minimize use of fuels, chemicals and lubricants; ensure no spillage;

(viii) Clear the work site after completion at least to pre project conditions, ensure that there are no materials, debris, spills etc., and prior to removal of temporary barriers/coffer dam; and
(ix) Implement work site safety at works in water body.

113. **Location of 1500 KL OHSR:** It has proposed in existing PHED campus in Nathuwas PHED campus. There are neither tree nor wildlife will be impacted.

114. **Location of 300 KL OHSR:** It has proposed in existing PHED campus in Bhandari Bawri PHED campus. There are neither tree nor wildlife will be impacted.

115. **Rising Main Pipe Laying from WTP/CWR Nand Samand Dam to CWR Nathuwas and Nathuwas CWR to Ganesh Takri GSLR:** out of 16.85km, Approx. 1700 m length of proposed new raising main line from CWR Nand Samand Dam to Gaesh Takri and Ganesh Takri to Nathuwas OHSR along with Haldi Ghati road is passing through Bandariya Magra forest block. There is no tree cutting from new riainig main laying work because this laying is proposed along with roadside.

116. **Physical Cultural Resources.** There are two ASI protected monuments near Nathdwara town. As per preliminary design, no impacts envisaged but risk of uncovering archeological remains, given the long history of town, during the excavations cannot be ruled out completely. Construction contractors therefore should follow the below measures in conducting any excavation work:

- Create awareness among the workers, supervisors and engineers about the chance finds during excavation work;
- Stop work immediately to allow further investigation if any finds are suspected;
- Inform local Archeological Department / Museum office if a find is suspected and take any action, they require to ensure its removal or protection in situ
- Prepare a chance find protocol

117. **Tree cutting at project sites**. As for preliminary survey it has been found that there are 5 nos. trees i.e., 2 nos. Neem, One Palm, One Babul and One Eucalyptus are existed in proposed sites in PHED campus which may be required to cut. All efforts shall be taken from PIU/contractor to minimize tree cutting as much as possible. Nevertheless, tree cutting permission has been taken from the concerned authority in advance so that if tree cutting is extremely necessary and unavoidable, there may be no any issue of permission. Compensatory plantation shall be undertaken in the ration of at least 1:3. Water pipelines will be laid along the road within road right of way. There are no notable trees in the alignment, therefore no tree cutting is envisaged. Following measures need to be implemented to minimize and/or compensate for the loss of tree cover.

(i) Minimize removal of trees by adopting to site condition and with appropriate layout design of CWRs or any other site with trees
(ii) Obtain prior permission for tree cutting at Ganesh Takri and WTP sites or at any other site that may require tree cutting finalized during detailed design.
(iii) Plant and maintain 3 trees for each tree that is felled.

118. **Locations impacts of Water Supply Networks:** The Water Supply transmission and distribution networks will traverse through different city roads within ROW. Therefore no impacts shall be envisaged regarding location. These works will require advance permission from

concerned authority for road cutting and traffic diversion etc. No wildlife reported in project impact areas and no tree cutting will be required as per preliminary design and if any tree cutting will be required during execution mitigation measures shall be adopted.

119. It has to be assured by contractor that desired consents from RPCB are obtained for DG Sets, hot mix Plant. Contractor will ensure for compliances of all the conditions as mentioned in the CTE/CTO.

C. Design Impacts

120. **Design of the Proposed Components**. The Central Public Health and Environmental Engineering Organization (CPHEEO) manual suggests a design period of 15/30 years[4] in general while designing the systems for water supply 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. Technical design of all the elements of water supply (intake, WTP, reservoirs, pumping, transmission and distribution system etc.), follows the relevant national planning and design guidelines.

121. Following environmental considerations are already included in the project to avoid and/or minimize adverse impacts and enhance positive benefits:

(i) Adopting conjunctive use approach in water use; utilizing feasible surface water sources optimally thereby reducing the existing groundwater abstraction to the extent possible;
(ii) Locating components and facilities appropriately by avoiding sensitive locations like forests and protected areas (environmentally, socially, and archeologically);
(iii) Recovering wash water from treatment process to optimise the water use;
(iv) Designing the entire system to maintain optimal flow and terminal pressure, and optimising the overall energy usage;
(v) Avoiding usage of asbestos containing materials;
(vi) Reducing the incidence of water borne diseases by providing 100% population including urban poor with potable water supplies;
(vii) Provision of appropriate personal protection equipment to the workers and staff.

D. Design of Water supply components

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

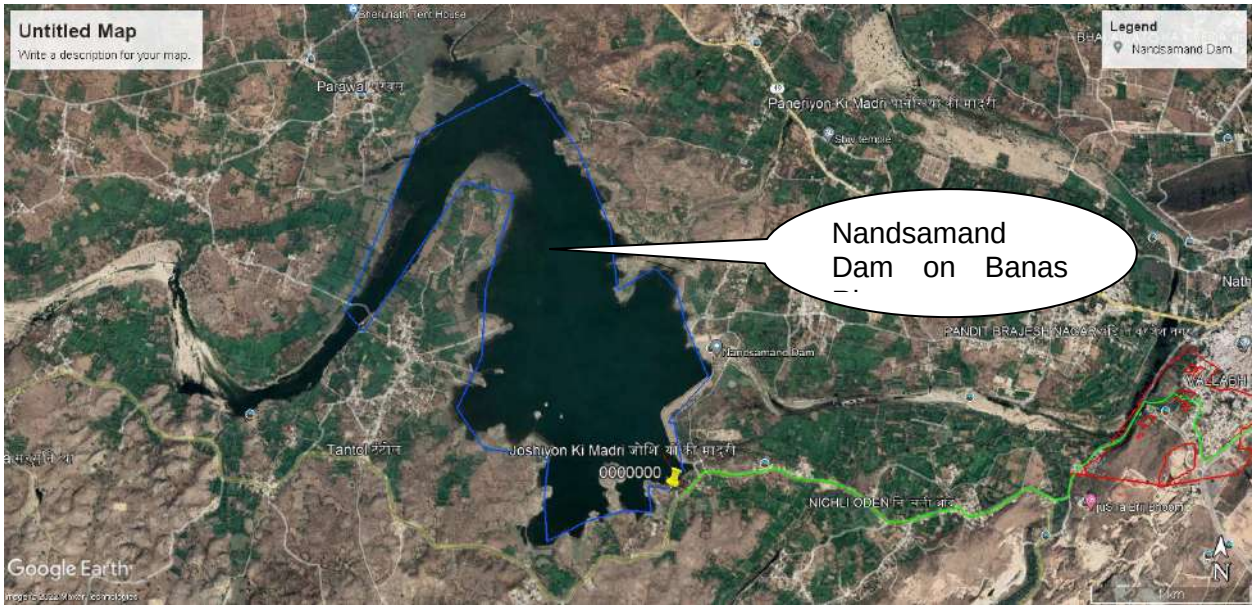
(i) Discontinuation of current unsustainable groundwater wells ,creating a new comprehensive water supply system based on a nearest surface water sources.

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

Ground water only in case of repair and maintenance of surface water infrastructure and lean season of water

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

123. The dam is located on Banas River at the coordinate 24°55'15.01"N and 73°46'45.30"E. The dead storage of dam will be maintained, therefore adverse impact on biodiversity will be negligible. There is no other feasible and dependable surface water source near Nathdwara. Therefore, it is proposed to adopt conjunctive use approach, utilizing both surface and groundwater sources to meet the demand. After completion of subproject all water demand of town will be fulfilled by the surface water of dam.



124. **Source:** The proposed source of water is Nanssamand Dam and availability of clear water from the proposed source of water is 11.64MLD. The sustainability report of water source is attached as **Appendix 9.**

a) **Selection of Site:** Dam already connected with the existing ***water supply*** system are sustainable sources with respect to quantity & quality; Presently the existing intake well for pumping raw water from Nand Samand dam is in back water of dam, during the summer season water is to be brought near existing pump house by the centrifugal submersible pumps. So in order to get the maximum benefit in pumping the raw water during severe drought conditions a new intake well is proposed near the spillway section of the Nand Samand dam

b) **Gauge level of Dam** Since the construction of the Nand Samand dam PHED has continuously maintained the daily water level and storage capacity details of the same are given in **Table 3.**

125. **Dam water quality :** The water quality of supplied water from PHED is safe as per the standards. PHED has continuously maintained the water quality testing. Water quality report of Raw and Treated water are given Table 9.

126. **Source Sustainability**: Total gross storage capacity of Nand Samand Dam is 749.6 MCFT and only 150 MCFT water is allocated (against total demand of 143.2 mcft) for the subproject which is about 20.01 percent of total dam capacity. Other than drinking water propose, water from dam is utilized for irrigation. Due to increase in urban area, irrigation demand is decreasing and expected to decrease further. As per “the Water Policy” of Government of India, in condition of low storage in the dam water the priority of usage is given to drinking water over irrigation. Nand Samand dam is Sufficient to full filling all demand of town water supply, and water from no other source is required.Also, during the dry summer months, the drawl would be very less compared to the water storage available.

127. The total live storage of Nand Samand Dam is 20.631 MCM and the proposed abstraction of water from Nand Samand Dam to meet 135 lpcd supply is 4.24 MCM (150 mcft) up to 2055 ultimate year, under proposed Nathdara Town water supply scheme in RUIDP Phase-IV. The total volume of live storage in this dam, is not used fully in present and proposed supply scheme and only 4.24 MCM storage uses is proposed and remaining quantity will be present in the dam. As per the record of data water receiving of Nanad Samand dam, in some years total receiving water quantity is less than the other years. In the year of 2018-19 Net receiving water/ stored in reservoir was 121 mcft that is less than proposed 150 mcft water allocation for drinking purpose from the dam but in previous year and next year of 2018-19 total Net receiving water/ stored in reservoir was 706 mcft and 750 mcft respectively so in lean year (2018-19) total quantity was balanced by previous year balance quantity. On the basis of above data analysis, it’s come that the proposed water source “Nandsanad dam” is sustainable and required quantity for supply from Nand Samand dam will be continue without any fluctuation.

128. **Design of Water Treatment Plant**. A 11 MLD WTP is proposed to be constructed at Nand Samand Dam to treat the raw water abstracted from the Dam to meet the drinking water standards for potable water supply in the Town. Since the package is proposed under DBO contract, the DBO contract will design the WTP during the detailed design phase following the guidelines/requirements/standards prescribed in the bid documents. Water treatment process will generate wastewater from filter backwash activity and sludge from sedimentation of particulate matter in raw water, flocculated and precipitated material resulting from chemical

coagulation, residuals of excess chemical dosage, plankton etc., and waste from rinsing and back washing of filter media containing debris, chemical precipitates, straining of organic debris and plankton. Bid includes various provisions in design of WTP to collect and dispose the wastewater and sludge generated in the treatment process, and the DBO contract will design the WTP accordingly. As it is a DBO contract, the process of wastewater recovery and sludge system given is indicative only at this stage, the actual system will be designed by the DBO contractor during the detailed design with the following bid provisions:

(i) Backwash water reuse system and sludge recovery and disposal system;
(ii) Backwash recycling components: Filter backwash holding tank, recovered water storage tank and pumping for recycling;
(iii) Discontinuation of current unsustainable groundwater wells and keeping only sustainable wells and creating a new comprehensive water supply system based on a nearest surface water sources.
(iv) To the maximum extent possible nearest surface water source is adopted;
(v) Appropriate location of intake to ensure water availability throughout the year
(vi) Treatment and disposal management of sludge from treatment process;
(vii) Minimizing water losses from pipelines by perfect jointing and alignments
(viii) using appropriate techniques (HDPE pipes up to 150 mm dia joined by electro fusion couplers using on-site electro fusion welding, and all higher dia pipes by on site butt welding);
(ix) Designing the entire system to maintain optimal flow and terminal pressure, and optimising the overall energy usage;
(x) Reducing the incidence of water borne diseases by providing 100% population including urban poor with potable water supplies;
(xi) Improve water use efficiency and reduce water wastage at household level by recording and monitoring the water usage, and charging the consumers as per usage; due consideration to urban poor;
(xii) Minimize unaccounted for water (UFW) losses using district metered area approach with flow meter and pressure logging arrangements to identify and rectify the leaks, and unauthorized connections; and
(xiii) Using low-noise and energy efficient pumping systems

129. **Selection of pipe materials for Water Supply system:** The pipe material designed for the Clear water transmission network is duly considering the durability of the material and its strength to withstand the expected normal internal and external stresses. The selection of pipe material has been done considering the parameters like: Ability to withstand internal / external pressure, Ease in handling and lowering of pipes, Corrosion resistance, Pipe jointing materials should be effective and reliable, Trouble-free maintenance operation should be ensured, Availability of specials and fittings, Pipe roughness coefficient. Various available alternates were compared during detail design like AC pipes, CC, DI and HDPE. AC pipes were not adopted because those are banned by government due to carcinogenic risks and CC pipes were not considered due to profuse leakages and heavy in handling. Therefore DI pipes were considered for transmission and HDPE pipes were considered for *distribution networks*.

D. Environmental Audit of Existing Water Supply Infrastructure

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

on biodiversity and natural resources, pollution prevention abatement including hazardous waste, occupational health and safety, community health and safety, and physical cultural resources. A random environmental audit is conducted to (i) assess the compliance of the existing infrastructure with environmental legislations and (ii) improve environmental performance to minimize future potential liabilities. The preliminary audit note is given in **Appendix 6**. A more detailed environmental audit and risk assessment shall be carried out during detailed design stage and incorporated into the final IEE.

131. All the existing infrastructure facilities are located in Nathdwara town, which is an urban area and where there are no protected or sensitive environmental areas such as forests, wildlife sanctuaries or archeologically protected areas. Therefore, there are no risks or impacts on biodiversity and natural resources. The designed project will optimally utilize the surface and groundwater sources. Due to nature of components, the existing infrastructure components do not fall under the ambit of any environmental related regulations, and therefore there is no requirement of permissions or clearances. Presence of Asbestos Containing Material (ACM) in the form of asbestos cement pipes in the existing water supply infrastructure is a cause of concern due to its potentially hazardous nature. Project, however, do not include rehabilitation or repair of AC pipes, and the project, in fact, designed to discontinue the use of AC pipes. Presence of AC pipes in the existing facilities may create hazardous conditions for the workers and surrounding community. Besides, the generation and disposal of debris and discarded materials, and construction phase health and safety need to be considered and mitigated to comply with the SPS provisions. Following **Table 12** provides component wise compliances and concerns. Corrective actions for the identified environmental concerns are discussed in the following section.

Table 12: Environmental Audit of Existing Facilities

Infrastructure	Details	Designed Rehabilitation	Compliance with environmental regulatory framework	Environmental Concerns
450 KL Clear water reservoirs (CWRs) at Ganesh Takri, Nathdwara	RCC CWR at PHED Office Ganesh Takri	Civil repairs and rehabilitation, replacement of pipes, connections, electrical and mechanicals parts as required Cleaning Instrumentation and SCADA	No requirements under existing laws	Occupational health and safety, public safety during the construction works.
OHSRs	There are 13 Nos of OHSR in Nathdwara. Out of 13 OHSRs 12 are proposed to continue in this project and these 12 OHSRs are proposed for repairing.	Civil repairs and rehabilitation, replacement of pipes, connections, electrical and mechanicals parts as required Cleaning Instrumentation	No requirements under existing laws	Presence of AC pipes in existing connections Occupational health and safety, public safety during the construction works

Infrastructure	Details	Designed Rehabilitation	Compliance with environmental regulatory framework	Environmental Concerns
		and SCADA		Disposal of discarded material, debris including AC pipes

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

133. **Presence of asbestos containing material (ACM),** mainly AC pipes, in the existing infrastructure is the main concern. Asbestos is recognized as a cause of various diseases and is considered health hazard if inhaled.

134. Most of the AC are old. There is no use of new AC pipes but for repairing work in the existing network, and for replace the damaged sections, AC pipes are being used. There will be no use of any AC pipe in the future as under the present project, water supply network is being provided in the entire town with non-AC pipes. It is normal practice in Rajasthan that existing AC pipes are left as it is in the ground and new pipes will be laid in a new alignment. As per the discussion with the local water supply staff in Nathdwara, existing AC pipes are laid long back, they are deep in ground, more than 2 m at many places, as the road level has raised considerably. In wider roads, there will be adequate space to lay the new pipelines, and therefore there is no need to remove the existing pipelines.

135. However, complete avoidance of handling and disposal of AC pipes may not be possible. There are narrow lanes, where AC pipes may be encountered during the laying of new pipes. Some connections / inlet / outlet pipes at the existing CWRs are also of AC pipes. These will be removed and replaced with new non-AC pipes. At present no maps available on the exact location / position of AC pipes. The local long serving O and M staff of PHED seem to be well aware of the location of AC pipes in the roads. Consultation with the staff indicates that of the total 100 km of underground AC pipes, about 5% may be required to be removed, especially in the narrow lanes to lay the new lines. This will be about 5 km length of water pipes.

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

137. Bureau of Indian Standards (BIS) Guidelines for Safe Use of Products containing Asbestos states that “Asbestos cement products (such as AC pipes) generally contain about 10-

15% asbestos fibers in a cement matrix that comprises the rest of the materials and are termed as locked in asbestos products as these products have the asbestos fibers bound in cement. There is very little possibility of generation of airborne asbestos fibers during any reasonable handling, storage, and use of such products. However, during storing and installation, recommended work practices shall be followed to avoid harmful exposure". According to Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, any waste having asbestos concentration limit of 10,000 mg/kg (i.e. 1%), however this will apply only if the asbestos containing substances are in a friable, powdered or finely divided state. Under the Basel Convention[5], asbestos or asbestos waste in the form of dust and fibers is classified as hazardous waste.

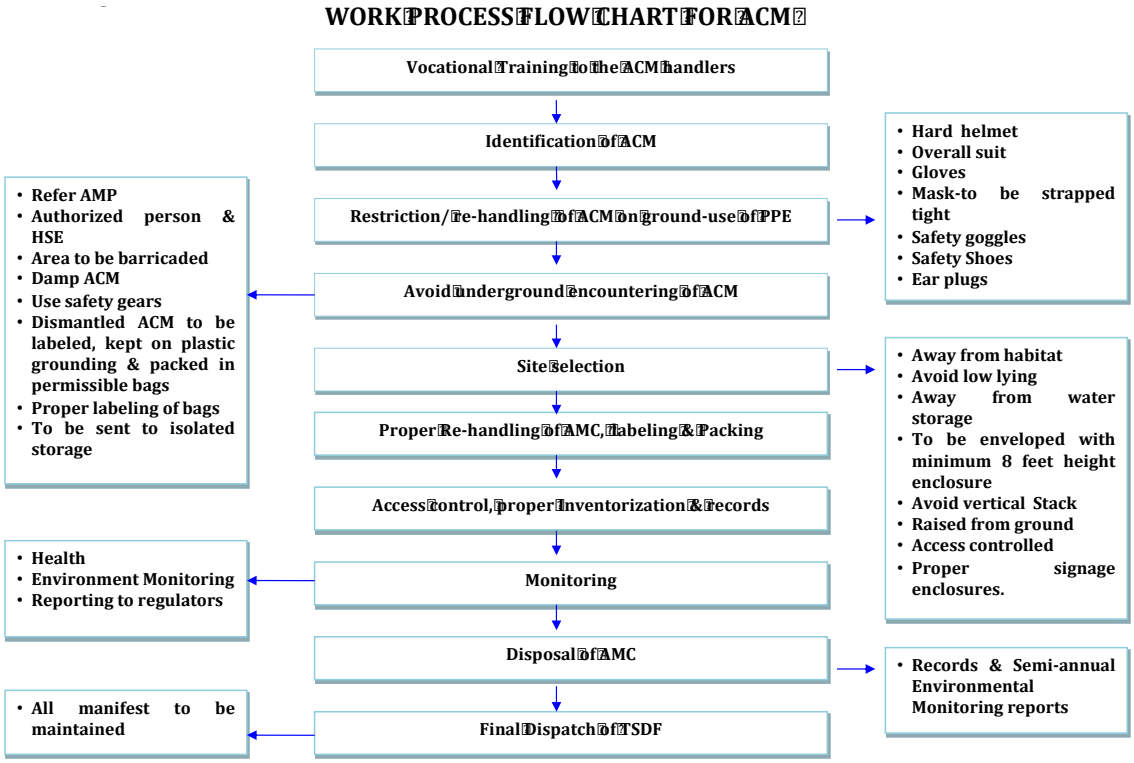
138. Working with or handling AC pipes in manner that produces dust, fibers, air borne particles etc., is very harmful and hazardous to the workers and general public around the work sites. The condition of existing underground AC pipes is not known, however, as these are old, pipes may be in deteriorated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

139. During the IEE preparation, an expert on Asbestos and ACMs was mobilized to assist PMU to conduct an assessment and field validation of the extent of asbestos cement materials covered under the RSTDSP subprojects. The assessment has indicated that specific measures are necessary to safeguard the health and safety of the nearby communities and the potential contractors consistent with the requirements of the ADB SPS 2009. Activities such as clearing, transfer and disposal of AC pipes, work in narrow streets, and interventions in existing AC pipes may have adverse impacts on workers and surrounding population. Air borne asbestos if handled unsafely, cut, drilled or broken into pieces that may cause health issues such as Inflammation of the lungs, Mesothelioma, Peritoneal mesothelioma, Pleural plaques, Asbestosis and Bronchogenic Carcinoma. Following measures are to be implemented to avoid any impacts:

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

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

Figure 14: ACM Management Plan – Work Process Flow Chart



140. Requirement for the Contractor and the Subcontractor. The following are operational requirements related to works involving asbestos:

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

(ii) Adopting good practices per EHS Guidelines[6] to minimize the health risks associated with asbestos materials by avoiding their use in new construction and renovation, and, if installed asbestos-containing materials are encountered, by using internationally recognized standards and best practices to mitigate their impact;[7]

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

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

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

E. Pre-construction Impacts

141. PMU will engage an Asbestos Management Specialist to provide training and awareness, and to coordinate with various stakeholders on the risks, management, and mitigation measures required for the identification, safe handling, transport and disposal of the asbestos materials. Contractor will be instructed to not to remove any AC pipes if encountered and remain in-situ and lay new line parallel to it. Asbestos management plan is being prepared by contractor and shall be updated in next IEE update.

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

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

143. **Site selection of construction work camps, stockpile areas, storage areas, and disposal areas**. Priority is to locate these near the project location. However, if it is deemed necessary to locate elsewhere, sites to be considered will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems. Residential areas will not be considered for setting up construction camps to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust and noise and to prevent social conflicts, shortages of amenities and crime). Extreme care will be taken to avoid disposals near forest areas, water bodies, swamps or in areas which will inconvenience the community. Construction sites will be selected by DBO contractor in compliance with these conditions and the same will be reflected in Site Environmental Management Plan (SEMP) which is to be prepared by DBO contractor prior to start of construction and approved by PIU. Material stockpiles will be protected by bunds during the monsoon season to prevent silt runoff into drains. The subproject is likely to generate soil from excavations, which needs to be disposed of safely. The following measures should be considered for disposal of surplus and/or waste soil:

---

exposure to asbestos that should be prevented by using specially trained personnel to identify and carefully remove asbestos insulation and structural building elements before dismantling or demolition.

- The excavated soil should be removed from construction area at the earliest for beneficial reuse such as land raising / filling of excavated areas.
- Soil should be covered with tarpaulin sheets during the transportation.
- Soil transportation should not be done during the peak hours and should avoid narrow and heavy traffic routes and important religious or tourist sites

144. **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 and 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.

145. **Social and Cultural Resources.** Any work involving ground disturbance can uncover and damage archaeological and historical remains. For this project, excavation will occur in project sites, so it could make medium risk of such impacts if the site contains any archeological and historical remains. Nevertheless, PIU will:

(i) consult Department of Archaeology and Museums to obtain an expert assessment of the archaeological potential of the site;
(ii) consider alternatives if the site is found to be of high risk;
(iii) include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available; and
(iv) 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.

F. Construction Impacts

146. The civil works for the subproject include earth work excavation for pipeline, pipe laying, installing valves, flow meters and data loggers, 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 pipe laying works will include laying pipes at required gradient, fixing collars, elbows, tees, bends and other fittings including conveying the material to work spot and testing for water tightness.

147. The excavation will be done in such a way that there will be a minimum depth of 1.2 m above the water pipeline, and in narrow streets the cover above the pipe will be 0.7 m minimum. 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 bracings to avoid collapse of trenches, and also to avoid any risk to surrounding buildings. Once they are laid, pipes will be joined as per specification and then tested for any cracks of leakages.

148. The excavation of trenches for water pipes is expected to generate huge quantities of soil, about 80% of this soil will be used for refilling the trench after placing the pipe and therefore residual soil after pipe laying and refilling will be required to be disposed of. This soil shall be used for filling low lying area or stored/ dumped in approved debris disposal sites.

149. 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 Srinath Ji temple, residents, businesses, and the community in general. These anticipated impacts are temporary and for short duration. Water lines will be laid on either side of the roads/streets.

150. 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.

151. During the construction phase, pipe laying near the Srinath Ji temple may jam the local traffic and there will be possibility accident due to trenches near the Srinath Ji temple. To avoid the any possibility of accident near the Srinath temple, construction work will not be allowed on the time of Temple fair and adequate safety measures will be followed during the temple Arti time on normal days.

152. **Designed pipeline.** A detail survey is needed after finalization of alignment to access the feasibility of the alignment for need of any tree cutting, demolition of any structure, road and railway crossings, pipe laying in any private land, presence of any sensitive receptor along alignment, disturbance to public or business etc. Mitigation measures have been prepared for potential adverse impacts. Prior consent from landowners (if pipe laying is required in private land) and NOC from concerned departments (for pipe laying in roads, road/railway crossings etc) prior to start of construction works, is required. To mitigate the impacts of disturbance to road users during pipe laying works on road, it is strongly recommended that contractor dig only those length of road, up to which extent he can lay pipe on the same day and can back fill the trench and restore the road up to motorable conditions. All the safety measures for work on road such as barricades, road signage, traffic assistance etc. is required to be adopted by contractor during construction works. 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.

153. **Demolition works.** Demolition is proposed on old structures which have been delisting from their uses. Before demolishing the old structure, proper work plan and mitigation measures will be required for demolition works. Following mitigation measures are suggested for contractor-

- 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.
- Debris should be removed on the same day in covered container and should be disposed at identified disposal site.

154. **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 leveling; rest of the soil will be needed to be disposed in other locations. Proper storage and disposal plan from contractor is required before start of the work. Prior permission from land owner/concerned authority for storage and disposal of excess earth is required. Prior to the commencement of works, Contractor will follow all the prescribed rules[8] and shall identify a debris disposal site in consultation with the PIU/ULB and adhering to following criteria:

- The site shall be selected preferably from barren, infertile lands. In case agricultural land needs to be selected, top-soil stripping, stacking and preservation should be undertaken prior to initiation of any activities.
- Debris disposal site shall be at least 200 m away from any surface water body.
- No residential areas shall be located within 200 m downwind side of the site.
- The site is minimum 250 m. away from sensitive locations like hospitals, religious places, ponds/lakes or other water bodies.
- The local governing body and community shall be consulted while selecting the site.
- Soil storage site should be properly demarcated by fencing and information board should be placed at entrance
- At soil storage site soil should be covered by tarpaulin or regular water sprinkling should be done to reduce dust emission
- At soil disposal site the disposed soil should be leveled on daily basis and no heap or mound should be left at end of the day

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

(i) Use material sources permitted by government;[9]
(ii) Verify suitability of all material sources and obtain approval of PIU; and
(i) 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 RPCB and will collect the copy of these certificates and submit to PIU/consultants

156. **Work near Forest Areas/Protected Areas.** The raising mains in passing through protected forest area. Although the pipeline will be laid within ROW of existing road, given their proximity of forest area, following measures are to be implemented to avoid any impacts due to trespassing or accidental entry or in the unlikely event of wildlife movement near the work sites:

(i) Pipeline alignment site and associated work facilities shall be properly demarcated and barricaded;
(ii) All works, construction material storage/ancillary works shall be confined to the demarcated areas, no movement of workers, vehicles, equipment allowed outside this area;

[8] Construction and Demolition Waste Management Rules 2016 and Solid Waste Management Rules
[9] CTE and CTO will be required for batching plant, hot mix plant, crushers and DG set 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 RPCB and should collect the copy of these and submit to PIU/consultants. Quarry sites should also have the desired permissions.

(iii) Ensure proper barricading so that no wildlife, even if it is unlikely, accidentally enters work area;
(iv) No labor camps shall be located near intake or near forests (maintain minimum 2 km buffer);
(v) Limit the work to daylight hours only; no work after sunset
(vi) No workers /personnel shall enter forest areas; it is the DBOC responsibility to take necessary precautions & prevent workers removing/damaging trees/vegetation, hunting / harming animals;
(vii) Create awareness among workers on environment & safety; and
(viii) No high noisy works shall be conducted.

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

158. **Surface Water Quality.** Run-off from stockpiled materials and chemical contamination from fuels and lubricants during construction works can contaminate downstream surface water quality of the streams. 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 spoils management plan;
(ii) Avoid to construct any construction camps and labour camps away from any water body and do not allow to dispose any waste or sullage in to any water body
(iii) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets;
(iv) Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with PIU on designated disposal areas;
(v) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies;
(vi) Place storage areas for fuels and lubricants away from any drainage leading to

water bodies and provide impermeable lining under the storage yard of fuels and lubricants

(vii) Dispose any wastes generated by construction activities in designated sites;

(viii) Keep oil tray or pans under the DG set or during maintenance of mechanical equipments to avoid oil spillage resulting soil and water pollution, and

(ix) Conduct surface water quality Monitoring according to the Environmental Management Plan (EMP)

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

(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 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;

(ix) Provide all workers appropriate PPEs like ear plug/muff, working in high noise conditions;

(x) Keep all vehicles and equipment in good conditions to avoid excessive noise generation;

(xi) Provide noise barriers near sensitive receptors like schools, hospitals, temples, courts etc and consult in advance with sensitive receptors about the working hours (specially schools, hospitals, offices, courts etc) and avoid noisy works in those hours;

(xii) Avoid noisy works in nights in inhabited areas to avoid any disturbance to habitants; and

(xiii) Consult in advance with habitants and inform them about the nature and duration of works

(xiv) Conduct noise monitoring according to the Environmental Management Plan (EMP).

160. **Management Plan for Night works at Project Sites (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/DSC
(iii) Contractor should submit plan for night works for approval from PIU.
(iv) PIU should ensure that prior written information should be given to local authorities such as district administration, Police/traffic police, line agencies concerned, residents welfare association/business association/vyaparmandal of the affected areas and their consents/permissions should be taken prior to start of night works.
(v) PIU/DSC engineers should check and ensure that all the preparation as per management plan is done by contractor and contractor is having all the necessary equipment and materials for night works.
(vi) Contractor is required to have following equipment/arrangements for night works-
(vii) Contractors should have hand held noise level meter for measurement of noise during night hours
(viii) Contractors should have hand held lux meter for the measurement of illumination during night hours
(ix) Preferably electrical connections is available for running equipment otherwise sound proof/super silent Diesel Generator set should be available.
(x) Sound level should not increase as per following-

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

(xi) Illumination should be as follows-

Minimum illumination (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

(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 contractors safety personnel should closely monitor the safety of works continuously and noise and illumination levels on hourly basis and maintain photographic and videographic records as well as register the observations
(xxvi) Night works should be stopped early in the morning at least one hour before start of pedestrian/traffic movement
(xxvii) After completion of night works all the site should be cleaned and maintained obstruction free for day time movement of vehicles and pedestrians
(xxviii) Drivers and workers should be alert and responsive during night works
(xxix) All the wages to workers working in night hours should be as per the applicable labour acts
(xxx) Avoid any nuisance which may create problems to nearby habitants and work peacefully during night hours
(xxxi) Night works should not be conducted near hospitals and during peak seasons such as peak tourist season, students' exam times etc.

161. **Landscape and Aesthetics.** The construction works does not envisage any major cutting of trees, but it 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) Prepare and implement spoils management plan;
(ii) Avoid stockpiling of excess excavated soils;
(iii) Coordinate with ULB for beneficial uses of excess excavated soils or immediately dispose to designated areas;
(iv) Recover used oil and lubricants and reuse or remove from the sites;
(v) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;
(vi) Remove all wreckage, rubbish, or temporary structures which are no longer required; and

(vii) Request PIU to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.
(viii) Minimize removal of vegetation and disallow cutting of trees;
(ix) If tree-removal will be required, obtain tree-cutting permit from the Revenue Department; and
(x) Plant three native trees for every one that is removed.

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

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

(i) Prepare and implement a Traffic Management Plan **(Appendix C-14).**
(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.

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

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

wooden/metal planks over the open trenches at each house to maintain the access.

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

166. **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.

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

(i) Comply with all national, state and local labor laws (see **Appendix C-12);**
(ii) Following best practice health and safety guidelines: IFC's General EHS Guidelines10, WHO Interim Guidance (and its updates) on Water, Sanitation, Hygiene and Waste management for the COVID19 virus (**Appendix C-24**), and Sector Specific (Water and Sanitation) Guidelines11;
(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;

[10]https://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES
[11]https://www.ifc.org/wps/wcm/connect/e22c050048855ae0875cd76a6515bb18/Final%2B-%2BWater%2Band%2BSanitation.pdf?MOD=AJPERES

(vi) The project area experiences extreme temperature during summer months of April and May, which may affect the health of workers engaged in construction work. Contractor should take necessary measures during summers including the following:
   a. Work schedule should be adjusted to avoid peak temperature hours (12 -3 PM)
   b. Provide appropriate shade near the work place; allow periodic resting and provide adequate water
   c. Provide necessary medicine and facilities to take care of dehydration related health issues

(vii) Provide supplies of potable drinking water;

(viii) Provide clean eating areas where workers are not exposed to hazardous or noxious substances;

(ix) Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers;

(x) Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted;

(xi) Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas;

(xii) Ensure moving equipment is outfitted with audible back-up alarms;

(xiii) Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and

(xiv) Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.

168. **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.

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

169. Central part of the town is characterized by narrow roads. Particularly, the areas located in old town have very narrow roads with sharp turns 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) 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

170. **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 safe drinking water, water for other uses, and sanitation facilities for employees;
(iv) Periodically test the drinking water supplied to workers from external agency and submit test report to PIU
(v) Ensure conditions of liveability at work camps are maintained at the highest standards possible at all times;
(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) Conduct periodical ground water quality monitoring at construction camps/storage yard as per EMP and submit report to PIU
(xi) Remove all wreckage, rubbish, or temporary structures which are no longer required; and
(xii) Request PMU to report in writing that the camp has been vacated and restored to pre-project conditions before acceptance of work.

171. **Social and Cultural Resources.** For this project, excavation will occur at locations known not to have archaeological values, so it could be that there is a low risk of such impacts. Nevertheless, the construction contractor will be required to:

(i) Strictly follow the protocol for chance finds in any excavation work;
(ii) Request PIU or any authorized person with archaeological/historical field training to observe excavation;
(iii) Stop work immediately to allow further investigation if any finds are suspected;
(iv) Inform PIU/ACM if a find is suspected, and take any action they require ensuring its removal or protection in situ.
(v) Adjacent to religious/historic sites, undertake excavation and construction work in such a way that no structural damage is caused to the building.

172. **Debris disposal.** There is an existing old and abandoned office building of PHED at proposed one CRMC site at PHED AEN campus. This building is required to be demolished for construction of CRMC at this site. A large amount of debris will be evolved due to this demolition, which will require proper mitigation measures to avoid disturbance and nuisance to working office and visitors to this office. Site for disposal of debris is not identified yet. Prior to the commencement of demolition works, contractor shall identify a debris disposal site in

consultation with the PIU and Consultant. Contractor will follow all the prescribed rules[12]during construction and adhering to following criteria (including but not limited to)-

(i) The site shall be selected preferably from barren, infertile lands. In case agricultural land needs to be selected, top-soil stripping, stacking and preservation should be undertaken prior to initiation of any activities.
(ii) The local governing body and community shall be consulted while selecting the site.
(iii) Contractor shall prepare a construction and demolition waste management plan in pre-construction phase for safe disposal of construction and demolition wastes as per applicable rules and submit to Municipality through PIU for approval
(iv) Debris disposal site shall be at least 200 m away from surface water bodies[13].
(v) No residential areas shall be located within 100 m downwind side of the site.
(vi) The site is minimum 250 m. away from sensitive locations like hospitals, religious places, ponds/lakes or other water bodies.

173. Following mitigation measures are suggested for contractor before and during 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.
- Debris should be removed on the same day in covered container and should be disposed at identified disposal site

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

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

[12]Construction and Demolition Waste Management Rules 2016 (

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

(ii) Maintain sufficient access to houses and shopkeepers (commercial establishments) during pipe laying work through metal sheets and temporary bridges
(iii) Locate entry and exit points in areas where there is low potential for traffic congestion;

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

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

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

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

177. **Asbestos Containing Materials.** No Asbestos containing material (ACM) is designed to be used in the subproject construction. There are ACM in the existing water supply infrastructure.

178. Existing water distribution network is mostly asbestos cement (AC) pipes, and because of the health risks these will be left in situ and replaced by new pipes. Details will be obtained from the PHED of the nature and location of all water supply infrastructure, and planning pipeline alignments carefully to avoid any conflict or damage. Given the dangerous nature of this material for both workers and citizens, additional measure should be taken to protect the health of all parties in the event (however unlikely) that AC pipes are encountered. RUIDP has decided not to replace the existing pipes including AC pipes and lay new pipes. This will reduce risks of handling and disposal of AC pipes. Further, prior to start of construction works of water supply system, PIU will develop a protocol to be applied in any instance that AC pipes are encountered, to ensure that appropriate action is taken. This should be based on the approach recommended by the United States Environmental Protection Agency (USEPA),[14]and amongst other things, should involve:

[14] In the USA, standards and approaches for handling asbestos are prescribed by the Occupational Health and Safety Administration (OHSA) and the Environmental Protection Agency (EPA) and can be found at http://www.osha.gov/SLTC/asbestos

(i) Training of all personnel (including manual labourers) to enable them to understand the dangers of AC pipes and to be able to recognise them in situ;

(ii) Reporting procedures to inform PIU immediately if AC pipes are encountered;

(iii) Development and application of a detailed H&S procedure to protect both workers and citizens. This should comply with national and international standards for dealing with asbestos, and should include: (a) removal of all persons to a safe distance; (b) usage of appropriate breathing apparatus and protective equipment by persons delegated to deal with the AC material; and (c) Procedures for the safe removal and long-term disposal of all asbestos-containing material encountered.

G. Operation and Maintenance Impacts

179. Operation and Maintenance of the water supply system will be carried out by Nagar Palika through DBO contractor for 10 years O&M period. The system have a design life of 15/30 years, during which shall not require major repairs or refurbishments and should operate with little maintenance beyond routine actions required to keep the equipment in working order. The stability and integrity of the system will be monitored periodically to detect any problems and allow remedial action if required. Any repairs will be small-scale involving manual, temporary, and short-term works involving regular checking and recording of performance for signs of deterioration, servicing and replacement of parts.

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

181. Since backwash water/wastewater from the process is recovered and recirculated in the WTP, no wastewater will be generated from water treatment process. Water treatment process will generate sludge from sedimentation of particulate matter in raw water, flocculated and precipitated material resulting from chemical coagulation, residuals of excess chemical dosage, plankton etc.; and waste from rinsing and back washing of filter media containing debris, chemical precipitates, straining of organic debris and plankton. The management and safe disposal of wastewater and sludge have already been considered in the design phase, and if these activities are implemented as intended will have no negative impacts.

182. It is proposed to use chlorine for disinfection of water, therefore there is a safety risk due to handling of large quantities of chlorine at the WTP. Likely impacts will be negligible if the various measures are suggested safety features and equipment to meet with any accidental eventuality are included in the design and development of the facility. During the operation phase, it is necessary that the facility is operated by trained staff as per the standard operating procedures.

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

(i) Judiciously utilize the available surface water and groundwater resources by adapting conjunctive use; prepare a water utilization plan every year post monsoon season depending on the water storage in Dams;

(ii) Ensure that dead storage is always maintained in Dams; utilize only available live storage for water supply;

(iii) Prepare and implement contingency plan for low rainfall years that will result in low water levels in Dams; in such cases revise the water supply rate appropriately to ensure uninterrupted water supply throughout the year; provide prior information to stakeholders;
(iv) Ensure that water supplied to the consumers at all times meet the drinking water standards; carry out regular sampling and testing, and disseminative information;
(v) Ensure zero wastewater discharge from the water treatment process via collection and recirculation of process wastewater/backwash water;
(vi) Implement sludge management plan; ensure collection, processing, drying, and safe disposal/reuse accordingly;
(vii) Assess composition and characteristics of sludge from the first batch operation at the initial phases, and confirm the handling, management and disposal/reuse actions suggested in the management plan;
(viii) Conduct periodic testing of sludge as per the EMP;
(ix) Ensure valid consent to operate (CTO) from RPCB for operation of WTP;
(x) Ensure that all conditions/standards prescribed by RPCB are complied duly;
(xi) Ensure that chlorinator facility is operated only by trained staff and as per the standard operating procedures; in case of any accident and/or maintenance activity, ensure that the staff follows documented procedures only; and
(xii) Implement emergency response system (ERS) for the chlorine leakage; Guidelines and Emergency plan for handling and storing chlorine is attached as Appendix **C-22**.

184. Biological hazards are among the environmental risks that may adversely impact the health and wellness of the workers and the community. Breakouts of diseases such as diarrhea, flu or pandemics such as the COVID19 shall be avoided. Designs and implementation of treatment systems shall ensure that disease-causing pathogens or viruses are disinfected and will not cause any health issues. The World Health Organization has released an interim guidance on Water, Sanitation, Hygiene and Waste Management for the COVID19 virus (see **Appendix C-24**). Measures on managing wastewater and fecal waste and keeping water supplies safe is critical to avoid the start or spread of any disease.

185. The citizens of the Nathdwara municipal area will be the major beneficiaries of the improved water supply, as they will be provided with a constant supply of better quality water, piped into their homes. This should improve the environment, should deliver major improvements in individual and community health and well-being. Diseases due to poor quality water, such as diarrhea and dysentery, should be reduced, so people should spend less on healthcare and lose fewer working days due to illness, so their economic status should also improve, as well as their overall health.

VII. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. Overview

186. The active participation of stakeholders including local community, Nagar Palika (ULB), PHED, 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.

187. A three-tier consultation process has been adopted for Phase-IV 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 this 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, Nathdwara Nagar Palika, Public Health Engineering Department, and Rajasthan Pollution Control Board. Secondary stakeholder are: NGOs and CBOs working in the area, community representatives, beneficiary community in general, government agencies, the executing and implementing agencies (LSGD and RUIDP), Government of India and the ADB.

B. Public Consultation

188. The public consultation and disclosure program is a continuous process throughout the project implementation, including project planning, design and construction. Socio-impact assessment (SIA) was conducted in April 2022. Informal and formal consultations at the project sites at Nathdwara were also conducted on April 2022. (**Appendix 7**).

1. Consultation during Project Preparation

189. Institutional consultations were conducted with the Governmental Departments such as Local Self Government Department, Public Works Department, Public Health Engineering Department, Nagar Palika Nathdwara, etc. The project designals are formulated in consultation with Nathdwara Nagar Palika and the proposals have been finalized only after certification of Nagar Palika and other stakeholders that the proposals suit the requirements of the ULB.

190. 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.

191. It was observed that people are willing to extend their cooperation as the designed activities are aimed at enhancing 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 advance notice before construction and proper warning signs along the construction area to avoid accidents and inconvenience.

192. A town-level City Level Committee (CLC) has been formed in Nathdwara City 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 stakeholder committee meeting was organized in Nathdwara on dtd. 06.08.2021 to discuss the matter of designed Water Supply works in Nathdwara under the chairmanship of District Collector, Rajsamand in presence of consultants, RUIDP officials, PHED/ Municipal officials and other invitee members. Designed scope of works and technology was discussed in the meeting. The feedback and concerns of the stakeholders was taken into consideration for finalization of design and scope of works. The project was agreed by the committee for further course of

action of RUIDP. Details of CLC meeting, minutes and photographs are attached in **Appendix 7.**

193. Discussions was conducted with (Deputy Conservator of Forest) Rajasamand regarding:- i) Forest blocks location in Nathdwara town ii) existing water laying site in forest iii) impact of laying on forest trees iv) To filnalization of rising main alignment in forest areas to reduce the impacts on trees. During the meeting DCF office told about forest areas locations and tree species, wildlife and process of finalization of alignment and joint measurement survey.

194. Discussions were also conducted with Srinath ji temple Management Committee regarding:- i) Time of Fair of Srinath Ji temple, Boundary of the Temple, ii) Location of the Temple asserts in Nathdwara, iii) Boundary of the Temple Campus, iv) Opening and Closing time the Temple, v) Peak hour of Pilgrims arriving into the Temple, vi) Day, Hour, Months in which total number of Pilgrims is low. Mitigation measures from outcomes of both consultation were included in EMP tables

1. Consultation during construction

195. Prior to start of construction, Nathdwara Nagar Paalika 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 environmental issues. At each ward/neighborhood level, focus group meetings will be conducted to discuss and plan construction work with local communities to reduce disturbance and other impacts, and provide a mechanism through which stakeholders can participate in project monitoring and evaluation.

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

C. Information Disclosure

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

198. 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.

199. 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 designed detours will be communicated via advertising, pamphlets, radio broadcasts, road signage, etc.

200. Project related information shall be disclosed through public consultation and making relevant documents available in public locations. PMU and PIUs shall provide relevant safeguards information in a timely manner, in an accessible place and in a form and languages understandable to affected person and other stakeholders. For illiterate people, other suitable communication methods will be used.

201. 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

202. 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 resolutionS 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)[15] the system was effective in timely resolution of grievances in a transparent manner.[16] The multichannel, project-specific, three-tier GRM is functional at RUSDP, hence the design of GRM for RSTDSP takes into account the designed institutional structure for RSTDSP and the positive features and learnings from the previous GRM.[17]

[15] 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.

[16] 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.

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

203. **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.

204. 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

205. Affected persons will have the flexibility of conveying grievances/suggestions by dropping grievance redress/suggestion forms in complaint/suggestion boxes that will be installed by project PIUs or by e-mail, by post, or by writing in a complaints register in ULB offices/complaints register at contractor's work site[18] or by sending a Whatsapp message to the PIU[19] or by dialling the phone number of town level PIU/CAPPC or by dialling a toll-free number.[20] 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. [21] 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 construction management and supervision consultants (CMSC) and CAPPC on-site will provide the most easily accessible or first level of contact for quick resolution of grievances. Contact numbers and names of the concerned PIU safeguard and safety officer, contractors, CAPPC and CMSC personal will be posted at all construction sites at visible locations.

(i) **1st level grievance**. The contractors, PIU Executive Engineer (EE)/Assistant Engineer (AE) designated as safeguard and safety officer (social and environment), CMSC (safeguard staff) and CAPPC can immediately resolve

[18] 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.

[19] 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.

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

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

issues on-site, in consultation with each other and will be required to do so within 7 days of receipt of a complaint/grievance. If required, city level monitoring committee (CLMC)[22] will be involved in resolution of grievances at the 1st level.

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

(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).

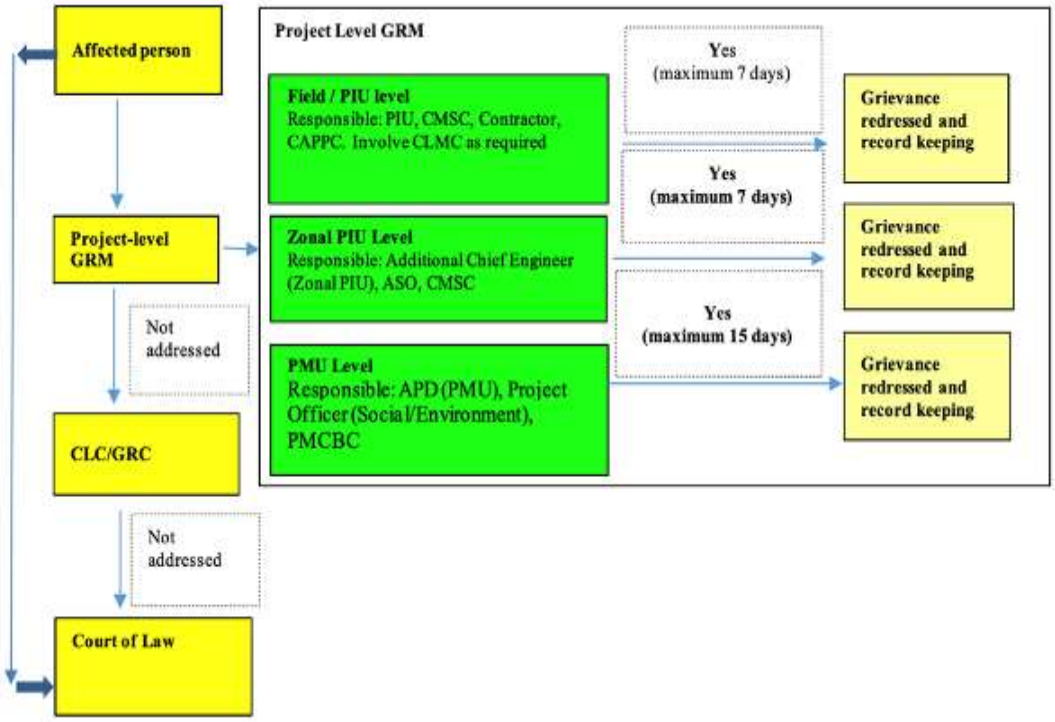
(iv) Grievances not redressed through this process within/at the project level within stipulated time period will be referred to the CLC/GRC, which has been set up[23] In its role as a GRC, the CLC will meet whenever there is an urgent, pending grievance. Other grievances can be discussed during its 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.

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

[22] 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.

[23] 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 15: Grievance Redress Mechanism-RSTDSP



Note: 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.

206. 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 designed under the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act (RFCTLARRA), 2013[24].

207. 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[25].

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

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

208. **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 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 C-17.**

209. **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.

210. **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.

IX. ENVIRONMENTAL MANAGEMENT PLAN

C. Environmental Management Plan

211. An Environmental Management Plan (EMP) has been developed to provide mitigation measures to reduce all negative impacts to acceptable level and monitoring the same. This is presented in the following tables, which show the potential environmental impacts, designed mitigation measures and responsible agencies for implementation and monitoring.

212. 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.

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

214. 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.

215. The contractor has submitted to PIU, for review and approval, a site environmental plan (SEP) including (i) designed sites/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 as per SEP; and (iv) budget for SEP implementation. No works can commence prior to approval of SEP.

216. The following **Tables-13** to **16** show the potential environmental impacts, designed mitigation measures and responsible agencies for implementation and monitoring. Environmental Monitoring Plan for ambient air, noise, water and soil quality during Construction and operation phase is given in **Table-17 and 18** respectively.

Table-13: Design Stage Environmental Management Plan

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation/ Monitoring	Cost and Source of Funds
Intake in Nanad Samand Dam	Water quality and ecological impacts	(i) Do not utilize the dead storage for supply; ensure that dead storage is available in the dam all times (ii) Design inlet of intake pipe in the dam with appropriate screen to avoid entry of aquatic organisms into inlet (iii) Select a construction methodology that is least disturbing, and appropriate for the in-situ soil condition, and able to complete the construction work prior to onset of monsoon (iv) Schedule the construction works during low water level period – late winter months to pre monsoon (February – June/July); ensure that works are completed during the same period to prior to onset of monsoon; (v) Erect temporary barriers to form enclosed construction area with least disturbance (vi) Allow adequate time to settle the distributed solids to prior to pumping out water; only clear/clarified water shall be pumped back into the reservoir; any silt laden water should be pumped to a silt pond (vii) Avoid/minimize use of fuels, chemicals and lubricants; ensure no spillage (viii) Clear the work site after completion at least to pre project conditions, ensure that there are no materials, debris, spills etc., and prior to removal of temporary barriers / coffer dam (ix) Implement work site safety at works in water body	DBO Contractor / PIU	Project costs
All work sites	Physical cultural resources and chance finds	(i) Ensure that worksites are not located in archeologically sensitive areas; liaise and reconfirm with local Archeological Department during detailed design phase; (ii) Create awareness among the workers, supervisors and engineers about the chance finds during excavation work; (iii) Stop work immediately to allow further investigation if any finds are suspected; (iv) Inform local Archeological Department / Museum office if a find is suspected and take any action, they require to ensure its removal or protection in situ.	DBO Contractor / PIU	Project costs
All work sites	Tree cutting	(i) Minimize removal of trees by adopting to site condition and with appropriate layout design of WTP or any other site with	DBO Contractor / PIU	Project costs

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation/ Monitoring	Cost and Source of Funds
		trees (ii) Obtain prior permission for tree cutting at WTP site or at any other site that may require tree cutting finalized during detailed design (iii) Plant and maintain 3 trees for each tree that is removed		
Design of water supply system	Non-compliance or non-adherence with the environmental considerations proposed in preliminary designs during detailed design:	Ensure compliance with the following during the detailed design: (i) Adopting conjunctive use approach water source; utilizing feasible surface water sources and groundwater source optimally thereby reducing the existing groundwater abstraction to the extent possible (ii) Locating components and facilities appropriately by avoiding sensitive locations like forests and protected areas (environmentally, socially, and archeologically). (iii) Recovering wash water from treatment process to optimise the water use (iv) Treatment and reuse of sludge from treatment process; providing a covered shed of adequate space to air dry the processed sludge (v) Designing the entire system to maintain optimal flow and terminal pressure, and optimising the overall energy usage (vi) Avoiding usage of asbestos containing materials (vii) Reducing the incidence of water borne diseases by providing 100% population including urban poor with potable water supplies (viii) Provision of appropriate personal protection equipment to the workers and staff	DBO Contractor / PMU	Project costs
Seismic sensitivity	Damage to infrastructure and potential risks: project area in low earthquake risk zone (Zone II)	(i) Designs of project component structures shall comply with relevant codes of design such as Bureau of Indian Standard (BIS) specifications for earthquake resistant design (IS: 1893: Criteria for earthquake resistant design of structures).	DBO Contractor/PIU	Project costs
Water Treatment Plant (WTP)	Inefficient treatment, treated water characteristics not satisfying the standards	i) Design treatment process that is suitable for raw water source characteristics duly considering the seasonal variation in quality if any (ii) Duly consider quality of groundwater that will be supplemented for surface water supply variations	DBO Contractor/PIU	Design consultants' cost

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation/ Monitoring	Cost and Source of Funds
		(iii) Treated water and supplied water at consumer end should meet the drinking water standards all times		
Water Treatment Plant (WTP)	Design to prevent pollution due to wastewater and sludge	Ensure that the following are included in the WTP design: (i) Backwash water reuse system and sludge recovery and disposal system (ii) Backwash recycling components: Filter backwash holding tank, recovered water storage tank and pumping for recycling (iii) Sludge management system components: Gravity thickeners for sludge from clarifiers, mechanical sludge dewatering system, storage facility for dewatered sludge (iv) Disposal of sludge at a landfill or the disposal site provided by the ULB	DBO Contractor/PIU	Project costs
WTP	Sludge management	(i) Prepare sludge management plan for safe handling and disposal of sludge from WTP (ii) Estimate the quantity of sludge / solids generated from the WTP during the detailed design phase, and likely composition based on the raw water quality and process chemicals (iii) Minimize the quantity of solids generated by the water treatment process through optimizing coagulation processes; (iv) Recover process chemicals to the extent possible to minimize / prevent the disposal (v) Carryout pretreatment prior to disposal (vi) Dispose dried sludge / solids from WTP at approved solid waste landfill / disposal site identified by ULB ; this should be identified during the detailed design phase (vii) Evaluate the option of land application during the operation stage; conduct quality tests on the first batch of sludge generated from the WTP, check for physico chemical characteristics including heavy metals (viii) Manage hazardous/harmful waste if any, as per the Hazardous Waste Management Rules (ix) Employ safe and beneficial methods for disposal of dried sludge: in building and construction industry, brick / tile manufacturing etc.,	DBO Contractor/PIU	
WTP and	Hazardous / harmful	(i) Reduce the use of chemicals in the treatment process to	DBO	Project costs

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation/ Monitoring	Cost and Source of Funds
CWRs	chemicals	the extent possible (water treatment); provide non-chemical alternatives or easily recoverable and/or reusable chemicals or biocompatible alternatives. (ii) Establish proper handling / storage / application system according to the relevant standards, safety precautions and prevent accidental release / spill (iii) Provide leak/spill detection, collection / capture and safe disposal facilities such as chlorine absorption and neutralization facility (iv) Provide ventilation, lighting, entry and exit facilities; visible & audible alarm facilities to alert chemical/chlorine leak (v) Facility for isolation in the event of major leakages (vi) Eye wash & shower facility (vii) Personal protection and safety equipment for the operators (masks, oxygen cylinders, gloves, etc.,) (viii) Provide training to the staff in safe handling and application of chemicals, material safety, and standard operating procedures and emergency responses (ix) Develop emergency response procedures	Contractor/PIU	
Asbestos cement (AC) pipes in existing water supply system: clearing, transfer and disposal; work in narrow streets, and interventions in existing AC pipelines	Health impacts due to air borne asbestos if handled unsafely, cut, drilled or broken into pieces	(i) Develop ACM Management Plan (AMP) that includes identification of hazards, the use of proper safety gear and disposal methods. Sample AMP is provided in Appendix **C-20**. Adhere to the workflow process suggested in Figure 19. (ii) Conduct awareness program on safety during the construction work (iii) Undertake the construction work stretch-wise; excavation, pipe laying and trench refilling should be completed on the same day (iv) Provide barricades, and deploy security personnel to ensure safe movement of people and also to prevent unnecessary entry and to avoid accidental fall into open trenches (v) Identify risk of intervention with existing AC pipes. If there is significant risk, implement the AMP strictly that includes identification of hazards, the use of proper safety gear and disposal methods. (vii) Maintain records of AC pipes as per the AMP (viii) Refer to the instructions of the Asbestos Expert	DBO Contractor/PMU	Project costs

Field	Anticipated Impact	Mitigation Measures	Responsible for Implementation/ Monitoring	Cost and Source of Funds
Asbestos materials in existing PHED campus	Health impacts due to air borne asbestos if handled unsafely, cut, drilled or broken into pieces	(i) Conduct survey and inventory of existing asbestos materials on site (ii) Conduct risk assessment to determine extent of asbestos materials currently on-site (ii) Coordinate and provide support to the asbestos management service provider on the requirement of sampling, testing and disposing existing asbestos materials (iii) Ensure the selected area for temporary storage is suitable for safe storage of asbestos materials (iv) Incorporate international and national standards considered in designing the temporary storage (v) Ensure that handling and disposal of asbestos materials are carried out by specially trained service provider/s following Government of India requirements, or in their absence, internationally recognized procedures Refer to the requirements of the Asbestos Management Plan (Appendix **C-20**) and instructions of the Asbestos Expert	DBO Contractor/PMU	Project costs
Preparation of plans and protocols	Various impacts	(i) Preparation of ACM Management Plan (ii) Prepare traffic management plan (iii) Prepare occupational health and safety plan (iv) Prepare spoils management plan	DBO Contractor and CMSC with the assistance of PMCBC (for ACM plan)	Project costs

Table-14: 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	Consents, permits, clearance, NOCs, etc. A compliance checklist is appended to this report (**Appendix 2)**	PIU and Nathdwara Nagar Palika	PMU	No costs required
Legal	Environmental	(i) Obtain all	Consents, permits, clearance,	PIU/Consultants	PMU	Cost of

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
compliance	legal noncompliance may attract legal actions Failure to obtain necessary consents, permits, NOCs etc. can result to design revisions and/or stoppage of works	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 Refer table 6 & 7 for consent requirements	NOCs, etc.	in coordination of Nagar Palika, Nathdwara		obtaining all consents, permits, clearance, NOCs etc. prior to start of civil works responsibility of PIU.
Environmental monitoring of baseline conditions of air, noise, water and soil	To establish base line environmental conditions	Environmental monitoring through NABL approved laboratory	Environmental Monitoring Report of Air, noise, soil and water quality	Construction contractor	Consultants/PIU	Contractor
Utilities	Telephone lines, electric poles and wires, water lines and gas pipelines within proposed project area	Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase; and (ii) Require	-List and maps showing utilities to be shifted -Contingency plan for services disruption	Contractor in collaboration with PIU and with approval of PMU	CMSC/ PIU	No cost required. Mitigation measures are part of TOR of PMU, PIU and Consultants

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		construction contractors to prepare a contingency plan to include actions to be taken in case of unintentional interruption of services. (iii) Require contractors to prepare spoils management plan (**Appendix C-13**) and traffic management plan (**Appendix C-14**)				
Works close to forest areas	Disturbance / damage to flora, fauna	(i) transmission line work site shall be properly demarcated and barricaded; (ii) All works, construction material storage/ancillary works shall be confined to the demarcated areas, no movement of workers, vehicles, equipment allowed outside this area (iii) Ensure proper barricading so that no wildlife,	Working plan near forest area, Compliance of conditions of forest diversion Training / awareness program records	Contractor in collaboration with PIU and with approval of PMU	DBOC/ PIU	No cost required. Mitigation measures are part of TOR of PMU, PIU and Consultant

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		even if it is unlikely, accidentally enters work area (iv) No labour camps shall be located near forests (maintain minimum 2 km buffer) (v) Limit the work to daylight hours only; no work after sunset (vi) No workers /personnel shall enter forest areas; it is the DBOC responsibility to take necessary precautions & prevent workers removing/damaging trees/vegetation, hunting / harming animals (vii) Create awareness among workers on environment & safety; (viii) No high noisy works shall be conducted				
Construction work camps, hot mix plants, stockpile	Disruption to traffic flow and sensitive receptors	Prioritize areas within or nearest possible vacant space in the project location;	-List of pre-approved sites for construction work camps, areas for stockpile, storage and disposal -Waste management plan	Contractor to finalize locations in consultation and approval of PIU	CMSC/ PIU	No cost required. Mitigation measures

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
areas, storage areas, and disposal areas.		If it is deemed necessary to locate elsewhere, consider sites that will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems; Do not consider residential areas; Written consent of landowner/s (not lessee/s) for reuse of excess spoils to agricultural land Take extreme care in selecting sites to avoid direct disposal to water body which will inconvenience the community. (v) For excess spoil disposal, ensure (a) site shall be selected preferably from barren, infertile lands. In case agricultural land needs to be selected, written consent from				are part of TOR of PIU and Consultants and also part of contractual terms

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		landowners (not lessees) will be obtained; (b) debris disposal site shall be at least 200 m away from surface water bodies; (c) no residential areas shall be located within 50 m downwind side of the site; and (d) site is minimum 250 m away from sensitive locations like settlements, ponds/lakes or other water bodies.				
Sources of Materials	Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.	Prioritize sites already permitted by the Department of Mines and Geology If other sites are necessary, inform construction contractor that it is their responsibility to verify the suitability of all material sources and to obtain the approval of PMU and If additional quarries will be	Permits issued to quarries/sources of materials	Contractor to prepare list of approved quarry sites and sources of materials with the approval of PIU	CMSC/ PIU	No cost required. Mitigation measures are part of TOR of PIU and Consultants and also part of contractual terms

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		required after construction is started, inform construction contractor to obtain a written approval from PIU. Bid document to include requirement for verification of suitability of sources and permit for additional quarry sites if necessary.				
Consents, permits, clearances, NOCs, etc.	Failure to obtain necessary consents, permits, NOCs, etc. can result to design revisions and/or stoppage of works	Obtain all necessary consents (including CTE for WTP from RSPCB), permits, clearance, NOCs, etc. prior to award of civil works. (following consents are required- Tree cutting- local authority Storage, handling and transport of hazardous materials- RSPCB Forest clearence from Rajastahn Forest Department Sand mining,	Consents, permits, clearance, NOCs, etc.	PIU and Consultants	CMSC/ PIU	No cost required. Cost of obtaining all consents, permits, clearance, NOCs, etc. prior to start of civil works responsibility of PIU. Mitigation measures are part of TOR of PIU and Consultants

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
		quarries, borrow areas- Department of mines and Geology Traffic diversion/road cutting- local authority, traffic police Ensure that all necessary approvals for construction to be obtained by contractor are in place before start of construction Acknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs, etc. Include in detailed design drawings and documents all conditions and provisions if necessary				
Social and Cultural Resources	Ground disturbance can uncover and damage archaeological and historical	Develop a chance find protocol for use by the construction contractors in conducting any excavation work, to	Chance Finds Protocol	DBO Contractor and PIU	CMSC/ PIU	No cost required. Mitigation measures are part of

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Implementation	Monitoring of Mitigation	Cost and Source of Funds
	remains	ensure that any chance finds are recognized, and measures are taken to ensure they are protected and conserved.				TOR of PIU and Consultant

Table-15: 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	(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	-Visual inspection -No complaints from sensitive receptors -Records -PUC certificates - CTE and CTO; -Periodic Air Quality Monitoring;	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
	pipelines resulting to dusts and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulphur oxides, particulate matter, nitrous oxides, and hydrocarbons.	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				
Water quality	Mobilization of settled silt materials, and chemical contamination from fuels and lubricants during installation of pipelines can contaminate nearby surface water quality.	(i) Prepare and implement a spoils management plan (**Appendix C-13)** (ii) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets; (ii) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies; (iii) Place storage areas for fuels and lubricants away from any drainage leading to water bodies; (iv) Dispose any wastes generated by work in designated sites; and (v) Conduct surface quality Monitoring according to the Environmental Management Plan (EMP).	Areas for stockpiles, storage of fuels and lubricants and waste materials; -Number of silt traps installed along trenches leading to water bodies; -Records of surface water quality Monitoring; -Effectiveness of water management measures; -No visible degradation to nearby drainages,	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
			nallahs or waterbodies due to civil works			
Noise Levels	Increase in noise level due to earth-moving and excavation equipment, and the transportation of equipment, materials, and people	(i) Plan activities in consultation with PIU/Consultants so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance; (ii) Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach; (iii) Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and portable street barriers the sound impact to surrounding sensitive receptor; and (iv) Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at a distance of 10 m or more from the vehicle/s. (v) Quarterly environmental monitoring for ambient noise as per EMP	-Complaints from sensitive receptors; -Use of silencers in noise-producing equipment and sound barriers; -Equivalent day and night time noise levels (see **Appendix C-6**)	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Ground Water Quality	Contamination of ground water quality due to spillage of oil and lubricants	Prepare and implement a spills management plan; Provide impermeable liner on the ground and place layer of mortar or concrete over it in the oil and lubricants storage areas, provide spillage trap in oil and lubricant store, use dip tray and pump to pour oil from oil and lubricant drums; Dispose any oil contaminated wastes generated by construction activities	-CTO and CTE compliance; -Periodic GW Quality Monitoring Reports; -Areas for storage of fuels and lubricants and waste materials; - Number of oil traps installed in	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 scientific manner; and Conduct ground water quality monitoring according to the EMP	oil and lubricant storage areas; ;			
Surface water quality	Works in rains/ Mobilization of settled silt materials, and chemical contamination from fuels and lubricants during installation of pipelines can contaminate nearby surface water quality.	(i) Prepare and implement a spoils management plan (ii) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets; (iii) Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with PIU on designated disposal areas; (iv) Inspect all the drainage at construction site/construction camp/labor camp etc. and clear all the drainage lines so that no water stagnation/flooding may occur during heavy rainfall (v) As for a possible avoid trench works and excavation works (pipe laying) during monsoon season to avoid any water logging and accident due to it (vi) If open trenches are not avoidable during monsoon, keep ready all the mitigations measures to avoid water logging such as dewatering pumps and sufficient pipes, traffic assistance, barricades etc. (vii) Inspect and verify all the emergency measures and emergency control system before start of monsoon, keep the	(i) Areas for stockpiles, storage of fuels and lubricants and waste materials; (ii) Number of silt traps installed along trenches leading to water bodies; (iii) Records of surface water quality inspection; (iv) Effectiveness of water management measures; (v)No visible degradation to nearby drainages, nallahs or water bodies due to civil works	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
		emergency response committee on high alert during monsoon/heavy rain fall (ix) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies; (x) Place storage areas for fuels and lubricants away from any drainage leading to water bodies; (xi) Dispose any wastes generated by construction activities in designated sites; and (xii) Conduct surface quality inspection according to the Environmental Management Plan (EMP).				
Landscape and aesthetics	Impacts due to excess excavated earth, excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers, spoils, oils, lubricants, and other similar items.	(i) Prepare and implement spoils management plan (**Appendix C-13**); (ii) Avoid stockpiling of excess excavated soils; (iii) Coordinate with ULB/PIU for beneficial uses of excess excavated soils or immediately dispose to designated areas; (iv) Recover used oil and lubricants and reuse or remove from the sites; (v) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas; (vi) Remove all wreckage, rubbish, or temporary structures which are no longer required; and (vii) Request PIU to report in writing that the necessary environmental restoration work has been	(i) Complaints from sensitive receptors; (ii) Worksite clear of hazardous wastes such as oil/fuel (iiv) Worksite clear of any excess excavated earth, excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		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; (vi) Coordinate with Traffic Police for temporary road diversions and with for provision of traffic aids if	(i) Traffic route during construction works including number of permanent signages, barricades and flagmen on worksite (**Appendix C-14**); (ii) Complaints from sensitive receptors; (iii) Number of signages placed at project location.	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		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 spoils management plan (**Appendix C-13**). Contractor to Implement RP and to follow mitigation measures prescribed such as- (ii) Leave spaces for access between mounds of soil; (ii) Provide walkways and metal sheets where required for people; (iii) Increase workforce in front of critical areas such as institutions, place of worship, business establishment, hospitals, and schools; (iv) Consult businesses and institutions regarding operating hours and factoring this in work schedules; and (v) Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for	(i) Complaints from sensitive receptors; (ii) Spoils management plan (iii) Number of walkways, signages, and metal sheets placed at project location.	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		concerns/complaints.				
Socio-Economic - Employment	Generation of temporary employment and increase in local revenue	(i) Employ at least 50% of the labour force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available; (ii) Secure construction materials from local market. (iii) Comply with labor laws	(i) Employment records; (ii) Records of sources of materials (iii) Compliance to labor laws (see **Appendix C-12** of this IEE)	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Occupational Health and Safety	Occupational hazards which can arise during work	(i) Comply with all national, state and local core labor laws (see Appendix **C-12** of this IEE); Following best practice health and safety guidelines: IFC's General EHS Guidelines[26] and Sector Specific (Water and Sanitation) Guidelines[27] (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;	(i) Site-specific OH&S Plan; (ii) Equipped first-aid stations; (iii) Medical insurance coverage for workers; (iv) Number of accidents; (v) Supplies of potable drinking water; (vi) Clean eating areas where workers are not exposed to hazardous or noxious substances; (vii) record of H&S	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

[26]https://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES
[27] https://www.ifc.org/wps/wcm/connect/e22c050048855ae0875cd76a6515bb18/Final%2B-%2BWater%2Band%2BSanitation.pdf?MOD=AJPERES

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

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

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Health and Safety.	accidents and vehicle collision with pedestrians during material and waste transportation	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.	Management Plan given in **Appendix C-14.**	Contractor		implementation of mitigation measures responsibility of contractor.
Safety of sensitive groups (children, elders etc.) and others pedestrians in narrow streets	Trench excavation in in narrow streets will pose high risk to children and elders in the locality	(i) Provide prior information to the local people about the nature and duration of work (ii) Conduct awareness program on safety during the construction work (iii) Undertake the construction work stretch-wise; excavation, pipe laying and trench refilling should be completed on the same day (iv) Provide barricades, and deploy security personnel to ensure safe movement of people and also to prevent unnecessary entry and to avoid accidental fall into open trenches	-H&S plan including appropriate signs for each hazard present -Construction vehicles condition in H&S plan. Complaints from neighborhood and monitoring of accidents	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Work Camps and work sites	Temporary air and noise pollution from machine operation, water pollution from storage and 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 livability at work camps are maintained at the highest standards possible at all	-Condition in list of preapproved sites for construction work camps, areas for stockpile, storage and disposal prepared by the Contractor. Drinking water	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	times; (v) Train employees in the storage and handling of materials which can potentially cause soil contamination; (vi) Recover used oil and lubricants and reuse or remove from the site; (vii) Manage solid waste according to the preference hierarchy: reuse, recycling and disposal to designated areas; (viii) Ensure unauthorized persons especially children are not allowed in any worksite at any given time.	and sanitation facilities for employees			
Impacts due to night works (if required as per nature of works and feasibility at site)	Occupational hazards which can arise during work at night in extreme and unavoidable cases	(i) Contractors should have hand held noise level meter for measurement of noise during night hours (ii) Contractors should have hand held lux meter for the measurement of illumination during night hours (iii) Preferably electrical connections is available for running equipments otherwise sound proof/super silent Diesel Generator set should be available (iv) Sound level should not increase as per EMP (v) Illumination should be adequate as required according to nature of works (vi) As far as possible ready mix concrete from batching plant to be used, otherwise the concrete should be prepared away from residential areas and brought to the site (vii) All the noise activity like hammering, cutting, crushing,	As per Management Plan for night works (**Appendix C-18**).	Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

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

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		kids should not work in night time (xvii) All the vehicles and equipments being used at night works should have adequate type of silencers/enclosures/mufflers to reduce noise (xviii) All the vehicles should be checked for working head lamps, tail lamps, inner lights etc. before start of night works				
Social and Cultural Resources	Risk of archaeological chance finds	(i) Consult with Srinath Ji Temple management commettee, nearby people and devotees in pre-construction phase and explain the work method and duration of proposed works, take their suggestions and comments and incorporate in design the mitigation measures required (ii) Adjacent to religious/social sites, undertake excavation and construction work in such a way that no structural damage is caused to the religious building. (iii) Observe the local rituals and important dates of festivals specially Srinath Ji Temple, weekly/monthly/annual religious occasions in the religious places and do not make any disturbance/hindrance/obstacles during such time to the religious places, (iv) provide proper signage, barricades etc. to protect public and devotees from dangers of construction works.	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
Social and Cultural Resources specially Srinath Ji Temple	inconvenience of Devotees during Srinath Ji temple fair	(i) Consult with Srinath Ji Temple management committee, nearby people and devotees in pre-construction phase and explain the work method and duration of proposed works, take their suggestions and comments and incorporate in design the mitigation measures required. (ii) Adjacent to religious/social sites, undertake excavation and construction work in such a way that no structural damage is caused to the religious building.. (iii) Observe the local rituals and important dates of festivals specially Srinath Ji Temple, weekly /monthly/ annual religious occasions in the religious places and do not make any disturbance/hindrance/obstacles during such time to the religious places, (v) provide proper signage, barricades etc. to protect public and devotees from dangers of construction works.	Safety Management Plan for Srinath Ji Temple Fair (**Appendix C-25**)	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.
Monsoon preparedness	Disruption of utilities and water logging in trenches	(i) As for a possible avoid trench works and excavation works (pipe laying) during monsoon season to avoid any water logging and accident due to it (ii) if open trenches are not avoidable during monsoon, keep ready all the mitigations measures to avoid water logging such as dewatering pumps and sufficient pipes, traffic	As per monsoon preparedness plan& as per **Appendix C-19** "Guidelines for Safety during Monsoon/Heavy Rainfall"	Construction Contractor	CMSC/ PIU	Cost for implementation of mitigation measures responsibility of contractor.

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		assistance, barricades etc. (iii) Guidelines for safety during monsoon is attached as **Appendix C-19**				
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 (iv) Health check-up of workers suffering with symptoms of COVID-19 and test for same (v) isolation of workers suspected/suffering with COVID-19 and due medical care (vi) follow guidelines of WHO/Central/State/Local government and RUDSICO-EAP regarding COVID-19 (refer **Appendix C-24**)	Compliance of COVID-19 protocol and guidelines	Construction contractor	PIU/Consultants	Contractor
Post-construction clean-up	Damage due to debris, spoils, excess construction materials	(i) Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and (ii) All excavated roads shall be reinstated to original condition. (iii) All disrupted utilities restored (iv) All affected structures rehabilitated/compensated	PIU/Consultant report in writing that (i)worksite is restored to original conditions; (ii)camp has been vacated and restored to pre-project conditions;	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
		(v) The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these shall be cleaned up. (vi) All hardened surfaces within the construction camp area shall be ripped, all imported materials removed, and the area shall be top soiled and regrassed using the guidelines set out in the revegetation specification that forms part of this document. (vii) The contractor must arrange the cancellation of all temporary services. (viii) Request PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.	(iii)All construction related structures not relevant to O&M are removed; and (iv) worksite clean-up is satisfactory.			

Table-16 : Environmental Management Plan of Anticipated Impacts during Operation

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
Water supply system operation: water treatment	Supply of water not meeting drinking water standards, health and environment issues due to operation of WTP	(i)Judiciously utilize the available water in Dam water; prepare a water utilization plan every year post monsoon season depending on the water storage in Dam (ii)Ensure that dead storage is always maintained in Dam;	O&M contractor for 10 years and then Nagar Palika	Nagar Palika, Abu Road	O & M cost of contractor	Water supply system operation: water treatment

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		utilize only available live storage for water supply (iii)Prepare and implement Contingency Plan for low rainfall years that will result in low water levels in Dam; in such cases revise the water supply rate appropriately to ensure uninterrupted water supply throughout the year; provide prior information to stakeholders (iv)Ensure that water supplied to the consumers at all times meet the drinking water standards; carry out regular sampling and testing, and disseminative information (v) Ensure zero wastewater discharge from the water treatment process via collection and recirculation of process wastewater / backwash water; (vi) Implement sludge management plan; ensure collection, processing, drying, and safe disposal / reuse accordingly				

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(vii) Assess composition and characteristics of sludge from the first batch operation at the initial phases, and confirm the handling, management and disposal/reuse actions suggested in the management plan (viii) Conduct periodic testing of sludge as per the environmental monitoring plan (ix) Ensure valid consent to operate (CTO) from RPCB for operation of WTP (x) Ensure that all conditions/standards prescribed by RPCB are complied duly (xi) Ensure that chlorinator facility is operated only by trained staff and as per the standard operating procedures; in case of any accident and/or maintenance activity, ensure that the staff follows documented procedures only (xii) Implement Emergency Response System (ERS) for the chlorine leakage;				

Field	Anticipated Impact	Mitigation Measures	Indicator of Compliance	Responsible for Mitigation	Monitoring of Mitigation	Cost and Source of Funds
		(ixii) Guidelines and Emergency plan for handling and storing chlorine				
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 WTP before expiry date and follow all the conditions set forth in CTO	RSPCB	Nathdwara Nagar Palika/PHED/O&M Contractor	Nathdwara Nagar Palika/PHED/O&M Contractor	Nathdwara Nagar Palika/PHED/O&M Contractor
Routine maintenance of CWR and other facilities to ensure delivery of safe drinking water	Health impact due to supply of unsafe drinking water in the system	Ensure periodical maintenance and cleaning of OHSRs, CWRs to ensure delivery of safe drinking water Periodical testing of treated water to ensure treated water quality meets the required standards	Maintenance Records	O&M contractor for 10 years and then PHED , Nathdwara	PHED, Nathdwara	O&M cost of contractor
Leakages in water supply pipe lines	Entry of waste water into water supply pipes and health risk to public due to poor quality water	Ensure to identify and repair leakage immediately Strengthen grievance mechanism and attend the grievance of any leakage	Maintenance Records; Periodic Leakage Report;	O&M contractor for 10 years and then PHED , Nathdwara	PHED , Nathdwara	O&M cost of contractor
Asset management	Reduction in NRW Increased efficiency of the system	Preparation and implementation of O&M Manual	O&M Manual; Implementation Records;	O&M contractor for 10 years and then PHED , Nathdwara	PHED, Nathdwara	O&M cost of contractor

Table-17: 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	All work sites	Implementation of dust	Weekly during	Supervising staff,	No costs required

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
disturbances, nuisances, public & worker safety		control, noise control, traffic management, & safety measures. Site inspection checklist to review implementation is appended at **Appendix C-16**	construction	EHS officer and safeguards specialists	
Tree cutting	WTP, GLSR 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 WTP, batching plants, crusher, hot mix plant. DG sets etc.	WTP, batching plants, crusher, hot mix plants etc	Copies of Consents	Periodically	EHS officer, Environment Specialist of consultant	No cost required for monitoring cost for obtaining CTE/CTO from PMU and for others from Contractor
Ambient air quality	5 locations (Ganesh Takri/GSLR, Nathuwas/OHSR, Bhandari Bawri/OHSR, Nand Samand dam/WTP/CWR, and Pipe laying near sensitive receptor).	PM10, PM2.5, NO2, SO2, CO	Once before start of construction and quarterly (years 3 times) during construction	Contractor	Cost for implementation of monitoring measures responsibility of contractor
Ambient noise	5 locations	Day time and night time	Once before start	Contractor	Cost for

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
	(Ganesh Takri/GSLR, Nathuwas/OHSR, Bhandari Bawri/OHSR, Nand Samand dam/WTP/CWR, and Pipe laying near sensitive receptor).	noise levels	of construction and quarterly (years 3 times) during construction		implementation of monitoring measures responsibility of contractor
Surface Water quality	01 location: Nanad Samand Dam	pH, Turbidity, Total Hardness, DO, BOD, COD, Chloride, Hg, Iron, TDS, TSS, Calcium, Zn, Cr^{+6}, Magnesium, Copper, Manganese, Sulphate, Cyanide, Nitrate, Sodium, Potassium, Fluoride, Cadmium, Arsenic, Lead, Boron, Selenium, Aluminium, Total residual Chlorine	Once before start of construction and quarterly (years 4 times) during construction	Contractor	Cost for implementation of monitoring measures responsibility of contractor
Soil quality	4 locations (Ganesh Takri/GSLR, Nathuwas/OHSR, Bhandari Bawri/OHSR and Nand Samand dam/WTP/CWR)	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	Once before start of construction and quarterly (yearly 3-times) during construction	Contractor	Cost for implementation of monitoring measures responsibility of contractor

Table 18: Environmental Monitoring Plan of Anticipated Impacts during Operation

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
Monitoring of plantations	Plantations locations	Nos. of tree survived	monthly	O&M Contractor/Nagar Palika	O&M Contractor/Nagar Palika
Consent to operate	WTP	CTO should be renewed	5 yearly	Nathdwara Nagar	Nathdwara Nagar

Monitoring field	Monitoring location	Monitoring parameters	Frequency	Responsibility	Cost & Source of Funds
(CTO) from RSPCB		before expired		Palika/PHED	Palika, PHED
Monitoring of quality of water supplied to consumers	Consumer end-random sampling in all zones	As per CPHEEO norms (refer **Appendix C-1**)	Daily	O&M Contractor	DBO contractor Cost
Pipeline network to sustain operational efficiency and avoid early occurrence of leakages	Pipeline network	to be included in O&M plan prepared under the project	Daily/when required	O&M Contractor	DBO contracto r Cost
Reduction of NRW	Pipe line networks	As per RUDSICO-EAP norms	Daily/when required	O&M Contractor	DBO contractor Cost

D. Institutional Requirements

217. The Local Self Government Department (LGSD) is the executing agency which will be 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 designed to monitor the project implementation. The Project Management Unit (PMU) is at state-level and headed by a dedicated Project Director. The Project Implementing Units (PIUs) have two zonal offices (1 in Jaipur and 1 in Jodhpur). Each zonal office will be 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.

218. At the PMU level, the Project Director shall be supported by Additional Project Director (Chief Engineer-level) and a Chief Engineer, who shall then be supported by Dy Project Director and a Financial Advisor. There shall be one Project Officer for Social and another Project Officer for Environmental aspects of the project.

219. The PMU shall be 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 shall engage 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 Construction Management and Supervision Consultants (CMSCs) and PIU.

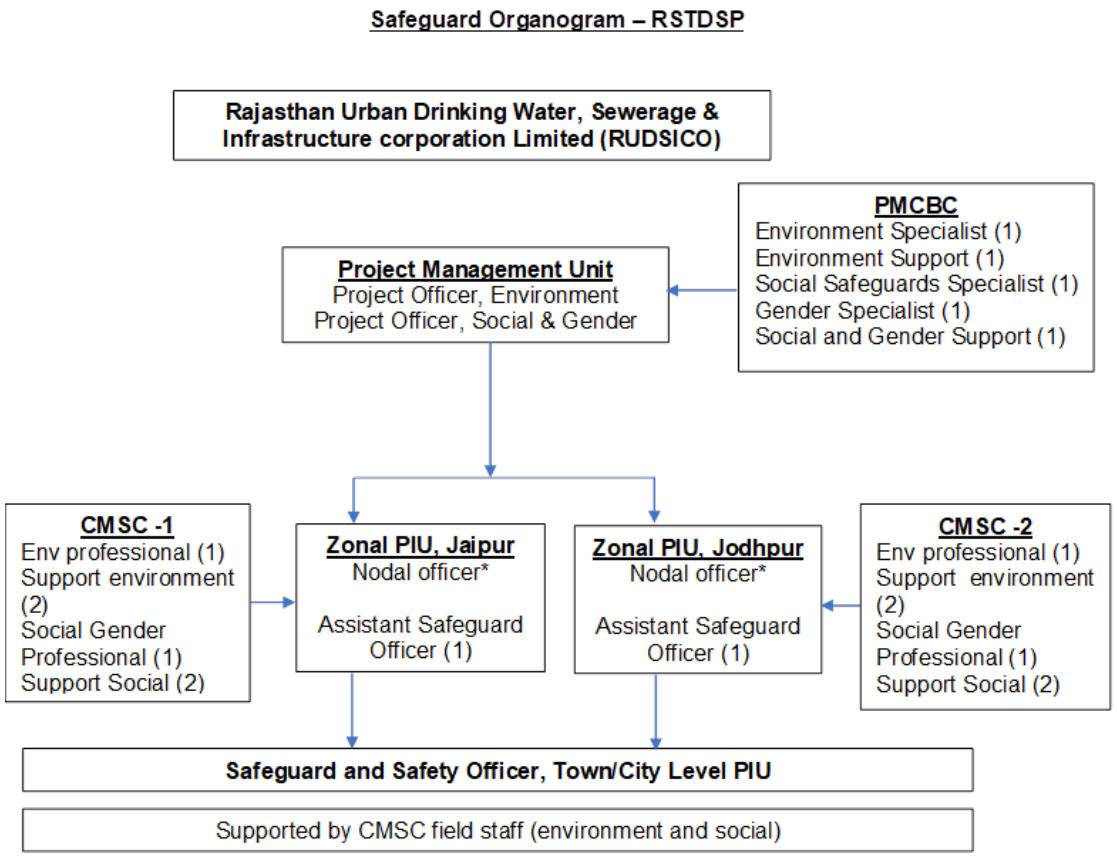
220. There are two zonal PIUs already established in Jaipur and Jodhpur. One PIU shall be established at every town before award of new projects. PIUs at the town-level shall be headed by a Superintending Engineer / Executive Engineer, who shall work as Project Manager and shall sign the contract documents,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

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

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

223. **Figure 16** shows Environmental Safeguards Implementation Arrangements within RUDSICO-EAP and **Table-19** summarize the safeguards implementation and institutional responsibility of environmental at all stages of the project.

Figure 16: Safeguards Implementation – RSTDSP



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

224. **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, two 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.

225. 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.

226. **Zonal Project implementation units (Zonal PIUs).** There are two 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.

227. 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.

228. **Town/City Level Project Implementation Unit (PIU).** 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 (EE) or Assistant Engineer (AE)] and supported by CMSC field staff. Environment Specialist of CMSC will assist PIU 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.

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

230. The Contractor has required to submitted to RUDSICO, for review and approval, a site-specific environmental management plan (SEMP) including (i) designed 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.

231. 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.

232. **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 19: 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 contractors preparing them on EMP implementation,	(i) Over-all environmental safeguards compliance of the project (iii) Monitor and ensure compliance of EMPs as well as any other environmental provisions and conditions. (i) Review monthly monitoring report (ii) Prepare and submit to ADB semi-annual monitoring reports (iv) If necessary, prepare Corrective Action Plan and ensure implementation of corrective actions to ensure no environmental impacts; (iii) Review and submit Corrective Action Plans to ADB (iv) Organize capacity building programs on environmental safeguards (iv) Coordinate with national and state level government agencies (vi) Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs (ix) Coordinate PIUs, consultants and contractors on mitigation measures involving the community and affected persons and ensure that environmental concerns and suggestions are incorporated and implemented	Compliance monitoring to review the environmental performance of project component, if required and as specified in EMP

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	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 mitigation measures found during the course of	(i) oversee day-to-day implementation of EMPs by contractors, including compliance with all government rules and regulations. (ii) take necessary action for obtaining rights of way; (iii) oversee implementation of EMPs, including environmental monitoring by contractors; (iv) take corrective actions when necessary to ensure no environmental impacts; (v) submit monthly environmental monitoring reports to PMU, (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**
	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 (iv) Provide EMP implementation orientation to all workers prior to deployment to worksites (v) Seek approval for camp	(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; (vi) Ensure any sub-contractors/ suppliers who are utilized within the context of the contract comply with	(i) Ensure EMP post-construction requirements are satisfactorily complied (ii) Request certification from PIU

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

E. Capacity Building and Development

233. Executing and implementing agencies need to have a sustained capacity to manage and monitor environmental safeguards. Although specialist consultant's 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.

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

235. 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 20.**

Table 20: Outline 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	All staff, ULBs and consultants involved in the project At PMU, Jaipur	PMU cost

	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		
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

F. Monitoring and Reporting

236. Prior to commencement of the work, the contractor will either submit a compliance report to PIU ensuring that all identified pre-construction environmental impact mitigation measures as detailed in the EMP will be undertaken or will provide EMP for the designed works with his Service Improvement Plan (SIP) covering all the requirements designed in this IEE. PIU with the assistance of the ASO and ESS of Consultants will review the report and thereafter PMU will allow commencement of works.

237. During construction, results from internal monitoring by the contractor will be reflected in their monthly EMP implementation reports to the PIU and Assistant Construction Manager of Consultants. ASO and ACM will review and advise contractors for corrective actions if necessary. Monthly report summarizing compliance and corrective measures taken will be prepared by ASO with the assistance of ACM and submitted to PMU.

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

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

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

241. 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.

G. EMP Implementation Cost

242. Most of the mitigation measures require the contractors to adopt good site practice, which should be part of their normal procedures already, so there are unlikely to be major costs associated with compliance. There are some of the provisions in bid documents like compliance of the requirements of health and safety during construction works as per applicable labor laws, labor insurance, equipment fitness, provision of labor welfare facilities, healthcare facilities etc. which are unanimously bound to contractor bidding for the project therefore it is understood that costs for such requirements are bound to contractor and no need to consider as cost of EMP implementation. Regardless of this, any costs of mitigation by the construction contractors or consultants are included in the budgets for the civil works and do not need to be estimated separately here. 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. Following **Table-21** gives the major cost of implementation of EMP during construction.

Table 21: 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	Each	15	4050	60750	Civil works contract
	Subtotal (A)					60750	
B.	**Monitoring Measures#**						
1	Air quality monitoring**	Pre-construction/ Construction (Quarterly)	Each	30	4920	147600	Civil works contract
2.	Noise levels monitoring**	Pre-construction/ Construction (Quarterly)	Each	30	1980	59400	Civil works contract
3	Ground Water**	Pre-construction/ Construction (Quarterly)	Each	12	6720	80640	Civil works contract
4.	Surface Water	Pre-construction/ Construction (Quarterly)	Each	6	6720	40320	Civil works contract
4	Soil Testing**	Pre-construction/ Construction (Quarterly)	Each	24	5880	141120	Civil works contract
	Subtotal (B)					**469080**	
C.	**Capacity Building**						
1.	Introduction and sensitization to environment issues	Pre-construction	lump sum			100000	PMU Cost
2.	EMP implementation	Construction	lump sum			50000	PMU Cost
3.	Plans and Protocols	Construction	lump sum			25000	PMU Cost
			lump sum			25000	Civil works contract
4.	Experiences and best practices sharing	Construction/ Post-Construction	lump sum			100000	PMU Cost
5.	Contractors Orientation to Workers on EMP implementation	Prior to dispatch to worksite	Lump sum			25000	Civil works contract
	Subtotal (C)					**3,25,000**	
D.	**Civil Works**						
	Barricading						
1	GI Sheet	Construction	Sqm	**27054**	**101**	**2732454**	Civil works

	Particulars	Stages	Unit	Total Number#	Rate (INR)	Cost (INR)	Costs Covered By
							contract
2	Barricading using 40 mm dia M.S. pipe ("B" class) and fixing suitably two rows of 100mm wide PVC Tape	Construction	m	150303	38.50	5786666	Civil works contract
	Barricading using 40 mm dia M.S. pipe ("B" class) with Nut and bolt	Construction	m	15030	50	751500	Civil works contract
3.	Sprinkling of Water for Dust Suppression	Construction	KL	2000	111	222000	Civil works contract
A.	**Sub Total (D)**					**9492620**	
D	Asbestos Management	Inventory, Testing, Overall Supervision for Asbestos Removal Storage, Transportation, Disposal / Treatment, Documentation and Reporting	Lump sum		7,000,000	7,000,000	Civil works contract
E	Grievance Redressal Mechanism Resolutions		Lump sum		350,000	350,000	Civil works contract
	Total (A+B+C+D+E)				**INR**	1,76,36,700	

* In preliminary design 5 trees are required to be cut (accordingly 3 time's taken in budget), being DBO contract, contractor will be required to revise it. Compensatory plantation measures to be followed by contractor

** CWR-2 locations, Pipelines/working locations on quarterly basis

Computation of total number of samples for environmental monitoring as per **Table 17.**

Summary of EMP Cost incurred by Institution :

Contractor Cost **- 1,76,36,700/-**
PMU Cost - INR 275,000/-
Total - INR 17911700/-

(In Words: Rupees One Crore, Seventy Nine Lacs, Eleven Thousand and Seven Hundreds only)

243. Environment Monitoring Location and Total number of samples are given in **Table 22**

Table 22: Details of Environmental Monitoring Locations

Town	Project components where environmental monitoring is required	Total numbers of environmental monitoring required in one quarter	Total numbers of environmental monitoring required in year (tree quarters leaving quarter of monsoon)	Project duration	Total number of environmental monitoring required during project duration
Nathdwara	5 locations (Ganesh Takri/GSLR, Nathuwas/OHSR, Bhandari Bawri/OHSR, Nand Samand dam/WTP/CWR, and Pipe laying near sensitive receptor).	Air- 5 Noise- 5 Surface Water- 1 Ground Water- 2 Soil- 4	Air- 15 Noise- 15 Surface Water- 3 Ground Water- 6 Soil- 12	2 years	Air- 30 Noise- 30 Surface Water- 6 Ground Water- 12 Soil- 24

X. CONCLUSION AND RECOMMENDATION

244. This IEE will be if made any changes in total length of water networks and change in approval status of other project components as per latest design approvals of proposed water supply works. Currently under water supply networks, 14 distributing network zones are considered for subproject and all 14 (100%) have been approved with total network of 167.73 km (100%) and thus there is an increase of total networks of 5.09 km (from proposed length of 162.24 km to final length of 167.73 km). This change in total length of networks is due to confirmatory survey and finalisation of project designed networks. For water supply. The process described in this document has assessed the environmental impacts of all elements of the Nathdwara water supply 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 pipeline 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 pipes will be laid. A resettlement plan has been developed in accordance with ADB SPS 2009 and Government of India laws and regulations.

245. Nathdwara is a town in Rajsamand district that is located in the semi-arid region of the state where the average temperature during winter season ranges between 10°C and 17°C and the summer season temperature range 32°C to 36°C. Also, Rajsamand District where Nathdwara Town is located, has seen an average rainfall of 459.8mm in the period 1901 – 1970 which has increased at an average of 20% during the period 2012-2016.

246. In general, it should be noted that the air quality as reported under the National Air Monitoring Program covering 21 monitoring stations located across Rajasthan revealed that the air quality in the urban areas in between “moderate” to “poor” category and suggests a link between air quality and vehicular emissions, uncontrolled burning of wastes and construction activities carried out without any mitigation measures. Groundwater levels in Rajsamand District where Nathdwara Town is located has seen a fall in 85% of the wells analyzed during the decadal period May 2006 – May 2015. In terms of Groundwater Quality, Rajsamand District has seen a high nitrate, chloride and flouride concentration in its wells. Noise levels are at permissible levels in the town.

247. However, it should be noted in Nathdwara Town, no environmental monitoring is carried out regularly by state or central-level agencies. Hence, as part of the Contractor’s pre-construction activities, it has been suggested that the Contractor determine the baseline environmental data during the Service Improvement Plan (SIP) period.

248. The subproject is formulated to address gaps in water supply infrastructure in a holistic and integrated manner. The main objective of the project is to improve water efficiency, security, and provide safe drinking water, this will have an important effect on public health. Investments under this subproject include: (i) Construction of one 900 KL GSLR at Ganesh Takri, one 1500 KL OHSR at Nathuwas, one 300 KL OHSR at Bhandari Bawri, One 11 MLD WTP at Nand Samand Dam, One Intake Well along with Pump House in Nandsmand Dam and One CWR along with Clerar Water Pump House near the Proposed WTP Location.

249. Presently, source water for Nathdwara town is mainly Nanasagar Dam surface water source. 2 nos. open wells and one tube wells have been utilizing in water supply but in the proposed project there are not included. Presently, about 70-80% area of municipality limit is covered under the drinking water supply scheme by PHED. Remain area which is newly developed and newly added to the municipality area remains unconnected with piped scheme.

250. At present, an intermittent water supply system is running in the town with actual service level 75 LPCD at consumers' end, which is less than standard of 135 LPCD. The supply duration is about 1 to 1.5 hours with low pressure.

251. 2 nos. of balancing reservoirs are proposed at Ganesh Takri and Nathuwas to feed all 13 nos. OHSRs. In the Ganesh Takri 3 trees are present which may be required to be cut, for which mitigation measures will be required by contractor during construction works. Ganesh Colony is located in adjoining location of Gaesh Takri colony. no wild life reported on both the sites.

252. WTP and CWR with pumping station are proposed at adjoining to existing WTP on open PHED Land near Nand Samand Dam. There are one Eucalyptus and one babul tree which may be impacted and need to be cut. Neither forest nor be wildlife are reported in neay by locations.

253. A new Intake Well is proposed near the existing intake well. Distance between both intake wells is approx. 50 m. Neither forest area or nor wildlife will be impacted from proposed intake well. 2 nos. new OHSR are proposed at Nathuwas PHED campus and Bhandari Bawari PHED campus. There no forest and no wildlife are impacted.

254. The Water Supply transmission and distribution networks will traverse through different city roads within ROW. approx.1700 m length of proposed new raising main line from CWR Nand Samand Dam to Gaesh Takri and Ganesh Takri to Nahuwas OHSR along with Haldi Ghati road is passing through Bandariya Magra forest block. There is no tree cutting from new rising main laying work because this laying is proposed along with road side.

255. Existing water distribution network is mostly asbestos cement (AC) pipes, and because of the health risks these will be left in situ and replaced by new pipes. RUIDP has decided not to replace the existing pipes including AC pipes and lay new pipes. This will reduce risks of handling and disposal of AC pipes. Further, prior to start of construction works of water supply system, PIU will develop a protocol to be applied in any instance that AC pipes are encountered, to ensure that appropriate action is taken.

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

257. 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 redress of their grievances, and describes the channels, time frame, and mechanisms for resolving complaints about environmental performance.

258. The Environmental Management Plan designed 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 details of cost estimate (budgetary provision) for mitigating the anticipated impacts by designed subproject component is approx. INR 1,79,11,700 (Rupees One Crore, Seventy Nine Lacs, Eleven Thousand and Seven Hundreds only) This indicative cost includes INR 7,000,000 (USD 100,000) for asbestos management (identification, inventory, removal, transport, temporary storage, disposal/treatment, and overall supervision of contractor related to asbestos materials).

259. The EMP will assist the PMU, PIU, Consultant and contractors in mitigating the environmental impacts, and guide them in the environmentally sound execution of the designed 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.

260. The EMP was included in the bid and contract documents to ensure compliance with the conditions set out in this document. The contractor has submitted to PIU, for review and approval, an updated EMP / site environmental management plan (SEMP) including (i) designed sites/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; and (iii) monitoring program as per EMP. The EMP is made binding on all contractors operating on the site and was 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. No works are allowed to commence prior to approval of SEMP. A copy of the EMP/approved SEMP will be kept on site during the construction period at all times.

261. 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 redress of their grievances, and describes the channels, timeframe, and mechanisms for resolving complaints about environmental performance.

262. Stakeholders were involved in developing the IEE through face-to-face discussions, on site meetings, and a city level consultation workshop, which was conducted for larger public participation in the project. Views expressed by the stakeholders were incorporated into the IEE and the planning and development of the project. The IEE will be made available at public locations and will be disclosed to a wider audience via the PMU and ADB websites. The consultation process will be continued during project implementation to ensure that stakeholders are engaged in the project and have the opportunity to participate in its development and implementation. The project’s grievance redress mechanism will provide the citizens with a platform for redress their grievances, and describes the informal and formal channels, time frame, and mechanisms for resolving complaints about environmental performance.

263. The project will benefit the general public by contributing to the long-term improvement of water supply system and community livability in Nathdwara. 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.

264. Therefore, as per ADB SPS, after the impact assessment of the project; up to this second IEE update; no significant impact was identified and the project is continued to be in environmental category B and does not require further environmental impact assessment.

265. **Recommendations**. The following are the status of compliance of recommendations applicable to the subproject to ensure no significant impacts:

Recommendations:

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

Appendix 1: Rapid Environmental Assessment (REA) Checklist

Water Supply

Instructions:

(i) 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.
(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.

(iii) 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 Sector Project (RSTDSP)/Nathdwara Water Supply subproject, Distt. Rajsamand, Rajasthan

Sector Division: Urban Development

SCREENING QUESTIONS	Yes	No	Remarks
Water Supply			
A. Project Siting Is the project area			
Densely populated?	√		Old areas of Nathdwara is densely populated. Water supply is proposed for whole town.
Heavy with development activities?		√	No developmental activities are present in the town except increasing habitations
Adjacent to or within, any environmentally sensitive areas?	√		The transmission line is passing through forest area along the existing road within existing ROW, prior permission from forest department is required before start of construction.
Cultural heritage site	√		There is Srinath Ji temple in the Nathdwara city area but no project activity is proposed near this temple.
Protected Area		√	
Wetland		√	
Mangrove		√	
Estuarine		√	
Buffer zone of protected area		√	
Special area for protecting biodiversity		√	
Bay		√	
B. Potential Environmental Impacts Will the Project cause…			

Pollution of raw water supply from upstream wastewater discharge from communities, industries, agriculture, and soil erosion runoff?		√	Underground water shall be utilized for water supply
Impairment of historical/cultural monuments/areas and loss/damage to these sites?		√	No such impacts are envisaged
Hazard of land subsidence caused by excessive ground water pumping?		√	
Social conflicts arising from displacement of communities?		√	
Conflicts in abstraction of raw water for water supply with other beneficial water uses for surface and ground waters?		√	Existing water source-Nand Samand shall be utilized as water source for proposed water supply therefore no conflicts may arise for ground water
Unsatisfactory raw water supply (e.g. excessive pathogens or mineral constituents)?	√		Ground water shall be used as water source and mineral constituents are required to be checked before supplying to consumers
Delivery of unsafe water to distribution system?	√		Unsafe water may be delivered if efficient maintenance of water supply distribution system is not done during operation phase
Inadequate protection of intake works or wells, leading to pollution of water supply?		√	No intake works are proposed
Over pumping of ground water, leading to salinization and ground subsidence?		√	Only required and sanctioned water will be extracted from tube wells
Excessive algal growth in storage reservoir?	√		Excessive algal growth may occur if storage reservoirs are not maintained regularly
Inadequate disposal of sludge from water treatment plants?		√	WTP Sludge will be utilized in land filling of low laying areas after its testing .
Inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances and protect facilities?		√	Low noise pumps are proposed in pumping stations.
Impairments associated with transmission lines and access roads?	√		Temporary impairments may be anticipated along the new transmission line routes during construction stage and mitigation measures will be required
Health hazards arising from inadequate design of facilities for receiving, storing, and handling of chlorine and other hazardous chemicals.	√		Contractor has to take precautions in handling and usage of chlorine to avoid any health hazard, no other hazardous chemicals are expected to be used during construction works
health and safety hazards to workers from handling and management of chlorine used for disinfection, other contaminants, and biological and physical hazards during project construction and operation?	√		Contractor has to take precautions in handling and usage of chlorine to avoid any health hazard
Dislocation or involuntary resettlement of people		√	All works are proposed in Govt. lands therefore dislocation or involuntary resettlement of people is not anticipated
disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	No such impact is envisaged

Noise and dust from construction activities?	√		Noise and dust risk will be envisaged during construction works. All the construction machineries employed will comply with noise emission standards of Central Pollution Control Board. Dust suppression measures such as water sprinkling will be employed
?Increased road traffic due to interference of construction activities?	√		Excavation and laying pipelines along public roads will interfere with the traffic. Construction material transport will increase traffic within city. Proper traffic management and construction planning will be ensured to minimize the interference
Continuing soil erosion/silt runoff from construction operations?	√		Construction work during monsoon shall be carried out with due care so that silt run off due to construction operation is prevented. No construction will be allowed during rains.
Delivery of unsafe water due to poor O&M treatment processes (especially mud accumulations in filters) and inadequate chlorination due to lack of adequate monitoring of chlorine residuals in distribution systems?	√		WTP is not proposed in the project, only ground water shall be used after adequate chlorination
Delivery of water to distribution system, which is corrosive due to inadequate attention to feeding of corrective chemicals?	√		Not envisaged. Non corrosive materials pipe will be used for distribution networks
Accidental leakage of chlorine gas?	√		Accidental leakage of chlorine gas may take place during chlorination. Utmost care should be taken
Excessive abstraction of water affecting downstream water users?		√	Water for the project is proposed only ground water as source
Competing uses of water?		√	Not applicable. only ground water shall be used for water supply services
Increased sewage flow due to increased water supply	√		Sewerage system is under execution in separate project keeping in mind 135 lpcd water demand for whole town
large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		√	Most of the unskilled workers will be hired locally, some of skilled workers will be brought from outside but numbers will not so large to have impacts on social infrastructure and services
Social conflicts if workers from other regions or countries are hired?		√	Outside workers will remain in labor camps and no social conflicts will envisaged
risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?		√	No explosives shall be used in project. Fuel and other chemicals will be used in very less quantities which will not have significant impact on community health and safety. Safe handling of fuels and chemicals will be ensured by contractor.

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

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: India/Rajasthan Secondary Towns Development Sector Project (RSTDSP), Nathdwara, Rajasthan
Sector : Urban Development
Subsector: Water Supply
Division/Department: SARD/SAUW

Screening Questions		Score	Remarks[28]
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	0	No such issue may affect the project
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	
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	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	0	
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	

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 risk
Other Comments: no any

[28] 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.

Appendix 2: Compliance with Environmental Criteria for Subproject Selection

Components	Criteria	Design Considerations (if criterion is not met)	Compliance
All subprojects			
	Subproject will avoid potentially significant adverse impacts that are diverse, irreversible or unprecedented (ADB SPS Category A for environment).		Being complied, the proposed components of subproject are proposed in already developed area and all impacts are predictable and mitigation measures are part of project design
	Comply with all requirements of ADB SPS 2009 and follow procedures set in this environmental assessment and review framework (EARF)		Being complied
	Comply with relevant national, and local laws, rules and regulations regarding EIA, environmental protection, pollution prevention (water, air, noise, solid waste, etc.) wildlife protection, core labor standards, physical cultural resources, health and safety, and other laws in specific sectors as indicated below		Being complied
	Does not include and/or involve any activities listed in ADB's Prohibited Investment Activities List[29]		Being complied
	Reflect inputs from public consultations	Refer to ADB SPS requirements on meaning consultations[30]	Being complied
Location	Avoid involuntary resettlement by prioritizing rehabilitation over new construction using vacant government land where	If cannot be avoided, prepare Resettlement Plan.	Being complied

[29]ADB SPS Appendix 5

[30]Per ADB SPS, meaningful consultation is defined as "a process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle; (ii) provides timely disclosure ofrelevant 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"

Components	Criteria	Design Considerations (if criterion is not met)	Compliance
	possible, and taking all possible measures in design and selection of site or alignment to avoid resettlement impacts		
	Avoid or minimize the cutting of trees	If tree is to be cut, consider 1:3 replacement	Being complied
Biodiversity	Avoid locating subprojects in critical habitats, such as, but not limited to, wildlife/bird sanctuaries, national parks, tiger reserves, elephant reserves, conservation reserves or core zone of biosphere reserves. Appendix 1 provides preliminary analysis using the International Biodiversity Assessment Tool (IBAT) key biodiversity areas, protected areas, IUCN red list species and likelihood of critical habitats per town. Should not directly affect environmentally protected areas, core zones of biosphere reserves and highly valued habitat	If criteria is not met, this is potential for Category A therefore alternate location should be considered. A Biodiversity Expert shall assess and confirm critical habitat qualification. Appendix 2 provides a Biodiversity Assessment Report prepared for a sample subproject (Abu Road water and sewerage subproject).	Being complied
	If work is proposed with the aim of improving the conservation or management of designated subproject sites (e.g. improved drainage), this must only be undertaken: (i) after a comprehensive study and development of management plans and criteria; and (ii) with the direct involvement and approval of national and local bodies responsible for the subproject site.		Being complied
Physical Cultural Resources	Should not result in the destruction/damage of or encroachment onto physical cultural resources (PCR)[31]	If location is within 300 m of notified protected monuments/ sites and there is no	Being complied

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

Components	Criteria	Design Considerations (if criterion is not met)	Compliance
	such as archaeological monuments; heritage sites and movable or immovable objects, sites, structures, group of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic or other cultural significance.	alternative, permissions from the ASI or State Department of Archaeology to be obtained prior to finalization of detailed engineering design. If potential physical cultural resources are found within or adjacent to project sites, a Heritage Impact Assessment is required to be conducted by a competent expert.	
Existing Facilities to be rehabilitated or expanded	Conduct environmental audit of existing facilities[32]per ADB SPS	For non-compliances, provide corrective action for each area of concern including cost and schedule to be included in the subproject EMP.	Being complied
Associated Facilities[33]	Analyse environmental impacts and risks to be included in the IEE		Being complied
Asbestos-containing materials (ACM) including, but not limited to, pipes, roofing, ceilings, insulation materials, excess pipes stored in PHED campuses, walls, etc.	Avoid handling or removing any ACM. Ensure asbestos concrete (AC) pipes facilities containing asbestos will not be disturbed and left in-situ. Appendix 12 provides asbestos management plan.	If ACM is suspected, asbestos verification by a competent expert is required and an asbestos management plan (AMP) prepared. Appendix 12 provides a sample AMP prepared for a sample subproject (Sardarshahar water and sewerage subproject). RUDSICO-EAP shall include AMP in all contracts. Contractor should be certified to handle ACM.	Being complied
	When designing subproject infrastructure that involves excavation in urban areas the relevant authorities must		Being complied

international level."

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

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

Components	Criteria	Design Considerations (if criterion is not met)	Compliance
	be consulted to ascertain the location of any ACM prior to any subproject activity. Locations of new infrastructure must then be designed to avoid excavating or disturbing any ACM.		
Right-of-way	Locate water supply pipelines within the right of way (ROW) of other linear structures (roads, irrigation canals) as far as possible, to reduce new land acquisition.		Being complied
	Ensure that pipelines ROW do not require land acquisition from individual farmers that is a significant proportion of their total land holding (>10%).		Being complied
Water Supply			
Sustainability	Utilize water sources at sustainable levels of abstraction only (i.e. without significant reductions in the quantity or quality of the source overall)	Water source sustainability or the relevant clearance from PHED should be provided in the subproject's IEE.	Being complied
Quality (raw water, treated water)	Ensure that water supply to consumers comply with the national drinking water standards at all times and confirm this by regular monitoring at WTPs and in domestic premises.		Being complied
	Avoid using water sources that may be polluted by upstream users	Baseline raw water quality to be included in the IEE.	Being complied
	Avoid water-use conflicts by not abstracting water that is used for other purposes (e.g. irrigation)	If there are other users, permits or clearance for the allocation should be provided in the IEE.	Being complied
Location	Locate all new facilities – Water Treatment Plants (WTP), Tube Wells (TW), etc. within 100m from houses, shops or any other premises used by people, thus establishing a buffer to reduce the effects of noise, dust and the visual appearance of the site.		Being complied
	Locate WTP at sites where there is no risk of flooding or other hazards that might		Being complied

Components	Criteria	Design Considerations (if criterion is not met)	Compliance
	impair functioning of the WTP or present a risk if damage to the WTP or the surrounding area		
Design	Ensure that the water supply system improvements are combined with improvements in sewerage to deal with the increased discharge of domestic wastewater.		Being complied

Appendix 3: Biodiversity Assessment Report - Nathdwara

IBAT

Integrated Biodiversity Assessment Tool

PROXIMITY REPORT
EXISTING OHSR NATHUWAS PHED CAMPUS

Country: India

Location: [24.9, 73.8]

Date of analysis: 20 May 2022 (GMT)

Buffers applied: 1 km | 10 km | 50 km

IUCN Red List Biomes: Freshwater, Terrestrial

Generated by: Noime Walican

Organisation: ADB

Overlaps with:

Protected Areas	0
Key Biodiversity Areas	5
IUCN Red List	35

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

About this report

This report presents the results of [6274-30802] proximity analysis to identify the biodiversity features and species which are located within the following buffers: 1 km, 10 km, 50 km.

This report is one part of a package generated by IBAT on 20 May 2022 (GMT) that includes full list of all species, protected areas, Key Biodiversity Areas in CSV format, maps showing the area of interest in relation to these features, and a 'How to read IBAT reports' document.

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

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

Data used to generate this report

- UNEP-WCMC and IUCN, 2022. Protected Planet: The World Database on Protected Areas (WDPA)[On-line], Cambridge, UK: UNEP-WCMC and IUCN. Available at: www.protectedplanet.net - May 2022.
- BirdLife International (on behalf of the KBA Partnership), 2022. Key Biodiversity Areas - April 2022.
- IUCN, 2021. IUCN Red List of Threatened Species - December 2021.
- IUCN. The IUCN Red List of Threatened Species. Version 2019-3. (2019). https://www.iucnredlist.org
- IUCN. Threats Classification Scheme (Version 3.2). (2019)
- Strassburg, B.B.N., Iribarrem, A., Beyer, H.L. et al. Global priority areas for ecosystem restoration. Nature 586, 724–729 (2020). https://doi.org/10.1038/s41586-020-2784-9

IBAT

Protected Areas

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

No protected areas within buffer distance

Key Biodiversity Areas

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

Area name	Distance
Kumbalgarh Wildlife Sanctuary	50 km
Menar Lake	50 km
Phulwari Wildlife Sanctuary	50 km
Sajjangarh Wildlife Sanctuary	50 km
Udaipur Lakes Complex	50 km

IUCN Red List of Threatened Species

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

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

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Ardeotis nigriceps	Great Indian Bustard	AVES	CR	Decreasing	Terrestrial
Sypheotides indicus	Lesser Florican	AVES	CR	Decreasing	Terrestrial

IBAT

Recommended citation

IBAT Proximity Report. Generated under licence 6274-30802 from the Integrated Biodiversity Assessment Tool on 20 May 2022 (GMT). www.ibat-alliance.org

How to use this report

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

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

Appendix 4: Salient features of the Nand Samand (Source of surface water)

NAND SAMAND IRRIGATION PROJECT TEHSIL NATHDWARA DISTRICT RAJSAMAND

SALIENT FEATURES

S.No.	Particulars	Data
1)	Location -	
i)	State	Rajasthan
ii)	District	Rajsamand
iii)	Tehsil	Nathdwara
iv)	River	Banas
v)	Location of dam site -	
	a) Latitude	25°-50'-50" N
	b) Longitude	73°-47'-0" E
2)	Hydrology -	
i)	Length of river up to dam site	127 km
ii)	Drainage area of dam	829.00 sq.km
iii)	Average annual rainfall	535 mm
iv)	Maximum annual rainfall year	1973 = 1003 mm
v)	Minimum annual rainfall year	1974 = 254 mm
vi)	Mean annual run off	8880.00 ha.m.
vii)	Design flood	3240.00 cumecs
3)	RESERVOIR DATA:	
)	River bed level	565.90 m
)	Lowest sill level	571.50 m
)	Full reservoir level	581.25 m
)	Maximum water level	582.80 m

7)	Irrigation :	
i)	Gross command area	8702.00 ha
ii)	Culturable command area	7885.00 ha
iii)	Irrigable area	3255.00 ha
iv)	Intensity (on average total CCA)	
	a) Kharif	10.14%
	b) Rabi	29.22%
v)	Area irrigated annually during Kharif (existing)	800.00 ha
vi)	Area annually irrigated during rabi (existing)	2304.00 ha
vii)	No. of farmers benefited	2985
viii)	No. of villages under command area	32 Nos.
ix)	Name of villages under command area	1) Nathdwara 2) Nichali Oden 3) Balawaton-Ka- Kheda 4) Modwa 5) Khokka Dhani 6) Kotariya 7) Dhani Rebariyan 8) Panerion Ki Madri 9) Namana 10) Nenpuria 11) Fulpura 12) Banka Ka Guda 13) Sanga Kheda 14) Kiyawas 15) Bijnool 16) Kunwaria Kheda 17) Bhatoli 18) Menthia Kala 19) Nakli 20) Fateh Nagar Ka Kheda 21) Sathana 22) Fukhia 23) Turkia Kheda 24) Pipli Dodyan 25) Oda 26) Deogaon 27) Tejpura 28) Fatehnagar 29) Jodhpuria 30) Amloi 31) Fatehpura 32) Rajiawas

Appendix 5: Surface Water Allocation Letter

कार्यालय सहायक अभियन्ता जल संसाधन उपखण्ड ...

क्रमांक / पेयजल / 2020–21 /

दिनांक :–

Covering letter
Bill submitted in formate of Exn WRD Rajsamand.

श्रीमान आयुक्त
नगर पालिका
नाथद्वारा ।

पेयजल आरक्षित बिल वर्ष 2020–21

आईटम	बांध का नाम	आरक्षित पेयजल की मात्रा	दर	यूनिट	रकम	वि.वि.
आरक्षित पेयजल	नन्दसमन्द बांध	150 MCFT	1000 / MCFT	एम.सी.एफ.टी.	1,50000 / –(रू.एक लाख पचास हजार मात्र)	–

कृपया बिल की राशि का भुगतान का चैक अधिशाषी अभियन्ता जल संसाधन खण्ड राजसमन्द के नाम से बनावें ।

– Sd –
सहायक अभियन्ता
जल संसाधन उपखण्ड नाथद्वारा

क्रमांक / पेयजल / 2020–21 / 567

दिनांक :– 23-11-2020

प्रतिलिपि श्रीमान अधिशाषी अभियन्ता जल संसाधन खण्ड राजसमन्द को सूचनार्थ प्रेषित है ।

सहायक अभियन्ता
जल संसाधन उपखण्ड नाथद्वारा

Revenue

25-11-20

Verified for Rs. 150000/- (One lac fifty thousand rupees only)

158

Scanned with CamScanner

Appendix 6: Preliminary audit note on existing facilities

Introduction

The objectives of this environmental audit of existing facilities of water supply sub-project are to (i) assess the compliance of the existing CWR and OHSRs/GLSRs to be rehabilitated/augmented during the implementation of RSTDSP with environmental legislation; (ii) improve environmental performance through monitoring the effectiveness of the management system; and (iii) increase the Executing agencies knowledge of itself and its activities, thus increasing its ability to continually improve and minimize future potential liabilities.

The environmental audit was carried out for the existing facilities. The methodology adopted for this audit was to initially review existing plans and technical information and list various activities being carried out in the water supply system. Due diligence was carried out to physically check whether environmental performance, health and safety, etc. were in compliance with national and state prescribed standards and guidelines. Team visited the locations of existing facilities and observed operations. Meetings and discussions with key personnel were held in the various stages of the audit. Various documentations regarding the operational aspects were also checked.

OHSRs:
.

There are 13 Nos of OHSR/GLSR in Nathdwara. Details are given below:

Sr. No.	Location	Capacity	Staging	Year of Construction
1	Teliyo Ka Talab	200 KL	15 Mtr.	1992
2	Teliyo ka talab	200 KL	15 Mtr.	2017
3	Balwanto ka kheda	200 KL	18 Mtr.	2017
4	Mohan Garh	400 KL	15 Mtr.	2003
5	Ganesh Takri	450 KL	15 Mtr.	2003
6	Tara Bhuj	600 KL	15 Mtr.	2003
7	Sukhadiya Nagar	200 KL	18 Mtr.	1984
8	Sukhadiya Nagar	90 KL	15 Mtr.	2013
9	Meera Nagar	200 KL	18 Mtr.	2013
10	Brampuri Nathawas	200 KL	18 Mtr.	2017
11	Housing Board	70 KL	12 Mtr.	1995
12	Nathawas	370 KL	15 Mtr.	2017
13	Police Line	100 KL	18 Mtr.	2003

Debris and corrosion causing contaminants can create a sludge like material at the bottoms or on the sides of unclean tanks. Often resulting in oxidation, this can hinder storage tank efficiency. Worse yet, dirty and contaminated tanks can pose increased safety risks to the environment and employees.

All concrete and plastering works will be done using mix in higher proportion than the existing, to ensure proper adhesion and strength. It has to be ensured that the new material sticks to existing by using cement slurry and or epoxy/adhesive wherever required. All concrete cracks will be repaired by using pressure grouting as per specifications.

Wherever concrete cover has peeled off from concrete (Water retaining) structure, structure needs to be repaired with epoxy mortar with primer. All corroded reinforcement bar shall be replaced with new iron bars.

All repairable concrete cracks to be made good by pressure grouting

Removal of bushes and planting of trees in the vicinity of existing building/ structure with half brick circular tree guard (distance to be maintained from building/

<table>
<tr><td></td><td>structures).
Subproject components are located away from settlements. Significant amount of demolition waste will be generated due to demolition of old buildings, excavation of existing road, which will be reused in construction and the remaining waste will be used for filling of low lying lands.</td></tr>
<tr><td>CWR</td><td>Two RCC CWRs already exist at the scheme, constructed in the year 1980 and 2003. The capacity of CWRs are given below:
<table>
<tr><th>Sr. No.</th><th>Location</th><th>Capacity</th><th>Year of Construction</th></tr>
<tr><td>1</td><td>Nand Samand Pump House</td><td>670 KL</td><td>1980</td></tr>
<tr><td>2</td><td>Balancing GSR at Ganesh Takri</td><td>450 KL</td><td>2003</td></tr>
</table>
CWRs are in function along with pump houses. This is used to pump the water to related ESRs; from there water is distributed among the consumers through distribution pipe. Wherever concrete cover has peeled off from concrete (water retaining) structure, structure needs to be repaired with epoxy mortar with primer. All repairable concrete cracks to be made good by pressure grouting
Removal of bushes and planting of trees in the vicinity of existing building/ structure with half brick circular tree guard (distance to be maintained from building/ structures). Subproject components are located away from settlements. Significant amount of demolition waste will be generated due to demolition of old buildings, excavation of existing road, which will be reused in construction and the remaining waste will be used for filling of low lying lands.
Contractor has to take precautions in handling and usage of chlorine to avoid any health hazard to workers from handling and management of chlorine used for disinfection No other hazardous chemicals are expected to be used during construction works</td></tr>
<tr><td>Present Condition of Existing Machinery:</td><td>The pump sets installed at pump house have served their useful lives. These sets work at very low efficiency and design data’s do not match with these pumps, therefore, proposed to be replaced
<table>
<tr><th rowspan="2">Sr.No.</th><th rowspan="2">Name of the Pump House</th><th colspan="5">Details of Pumping Machineries</th></tr>
<tr><th>Type</th><th>HP</th><th>Head</th><th>Discharge</th><th>Nos.</th></tr>
<tr><td>2</td><td>Ganesh Tekari Pump House</td><td>C/F P/Set</td><td>15</td><td>56 mt</td><td>600 LPM</td><td>2</td></tr>
<tr><td>3</td><td>Nathuwas Pump House</td><td>C/F P/Set</td><td>20</td><td>--</td><td>--</td><td>2</td></tr>
</table>
Electricity will be used for running equipment otherwise sound proof/super silent diesel Generator set should be used. It will be ensured that no leakage of discharge of fuels like diesel, petrol, and Oil & Grease can effect human health and environment.
Short term accidental spills are possible. To avoid contamination from fuel/lubricants, all equipment to be maintained and examined regularly. Required precautions will be taken in storage and handling of hazardous materials, as per the Hazardous Waste (Management and Handling) Rules, 1989</td></tr>
<tr><td>Transmission main & Distribution system (Type/size/length of pipe</td><td>Details of existing transmission mains are given below:
<table>
<tr><th>Sr. No.</th><th>Size of pipe line</th><th>Length of pipe line (Mt.)</th></tr>
<tr><td>1</td><td>D.I 200mm</td><td>15.5 km</td></tr>
</table>
Cast Iron (CI) pipe line is about 40 years old and due to fluoride deposit in the pipe line the diameter of pipe has reduced and pipe erodes. Therefore, the condition of</td></tr>
</table>

CI/AC pipe line is not satisfactory due to leakage and breakage. Hence proposed replacement by Ductile Iron (DI K-9) pipe.

The old pipe lines for rising mains are at present of Asbestos Cement (AC) material, which leak frequently result the pressure drop in the lines, therefore as per policy, the provision for replacement of these existing AC lines by new Ductile Iron (DI K-9) pipelines have been taken as per design requirement.

There are 13 water supply zones in Nathdwara. Nathdwara is provided with distribution system by gravity fed from respective OHSRs. The total length of existing distribution system is reported as below:-

Sr. No.	Size of pipe line	Length of pipe line (Mt.)
1	AC 2	30400
2	AC 1	55700
DI	D.I 100 and 200 mm	9700
4	C.I type 250 and 200 mm	18500
	Total	1143200 km

The existing distribution lines of AC/CI and uPVC pipes are very old with heavy leakages due to repeatedly breakages and joints leakages resulting heavy losses of clear water, therefore, need to be replaced by HDPE((high-density polyethylene) pipes. After laying the lines, the provision of road repairs has also been proposed in the project.

The World Health Organization considered asbestos in drinking water arising from asbestos cement pipe in their 1993 edition of the Guidelines for Drinking Water Quality and it is no longer being used and because of the health risks these will be left in situ and replaced by new pipes. Given the dangerous nature of this material for both workers and citizens, additional measure should be taken to protect the health of all parties in the event (however unlikely) that AC pipes are encountered. This should be done prior to the start of construction works of water supply system, PIU will develop a protocol to be applied in any instance that AC pipes are encountered, to ensure that appropriate action is taken. This should be based on the approach recommended by the United States Environmental Protection Agency (USEPA).

Ductile iron pipe is a pipe made of ductile cast iron commonly used for potable water transmission and distribution. This type of pipe is a direct development of earlier cast iron pipe, which it has superseded. Ductile iron pipe in the developed world is normally manufactured exclusively from recycled material including scrap steel and recycled iron. The pipe can be recycled after use. In November 2012, ductile iron pipe manufactured in the United States received certification as a sustainable product from the Institute for Market Transformation to Sustainability.

The environmental benefits that accompany the use of HDPE in water and wastew ater systems begin with its manufacturing. Pipe produced from HDPE resin uses si gnificantly less energy to manufacture when compared to other materials such as i ron and concrete. Transporting HDPE piping to municipal water and wastewater jo bsites requires far

less fuel than competing materials which are much heavier. HDPE is lightweight ye t extremely durable.

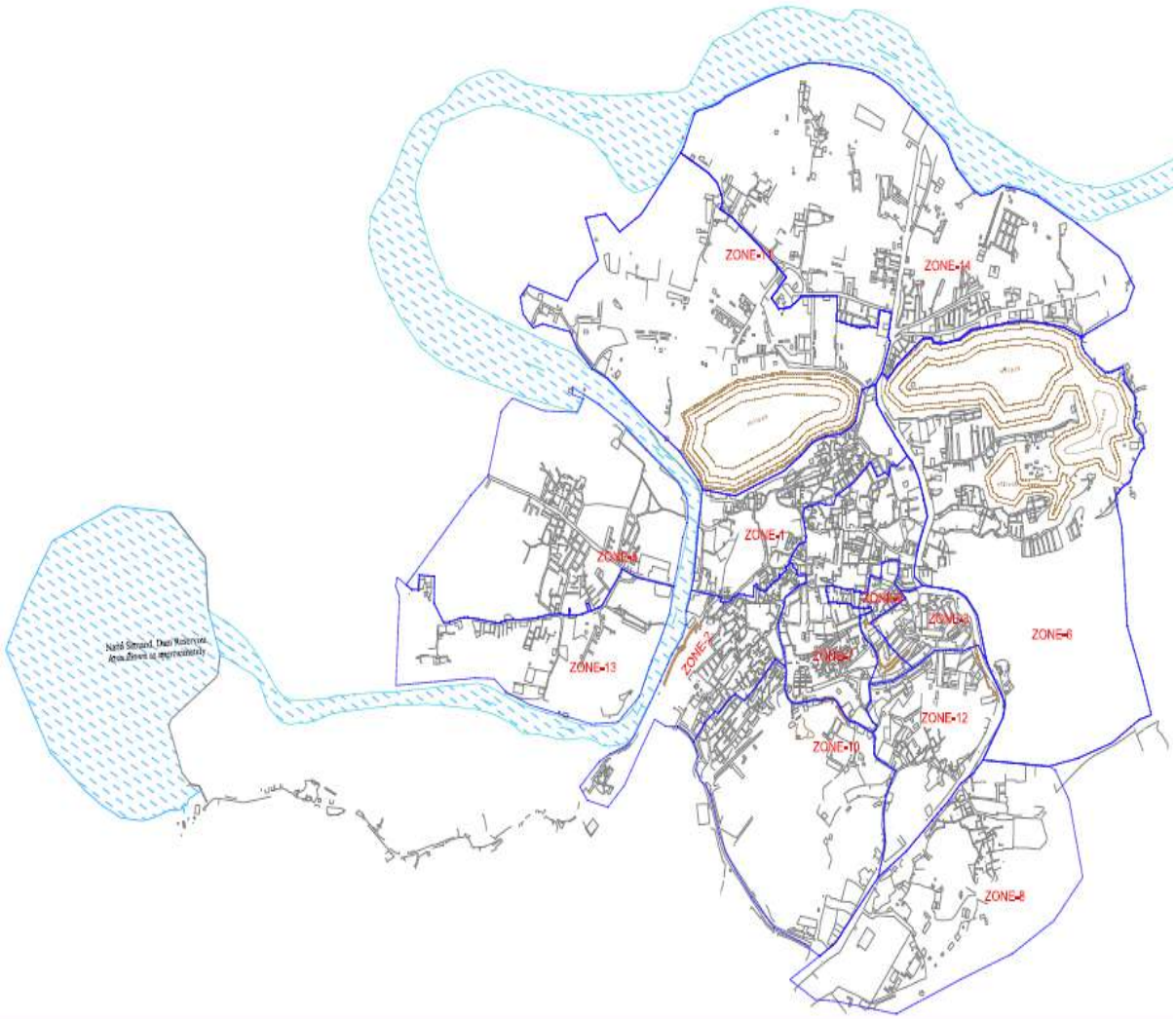
The flexible and lightweight makeup of HDPE bring more environmental benefits th rough lowimpact installation

practices such as horizontal directional drilling (HDD) and other trenchless operatio ns. HDD is minimally intrusive and

well suited for use in highly congested municipalities as well as crossings of enviro nmentally sensitive areas.

:

Figure 1 Zone Map of comprehensive water supply system in Nathdwara



Photos of Existing Components

Fig. 2 & 3: Intake Well at Nand Samand Dam

Fig. 4: Ganesh Takri Pump House

Fig. 5: Ganesh Takripumphouse

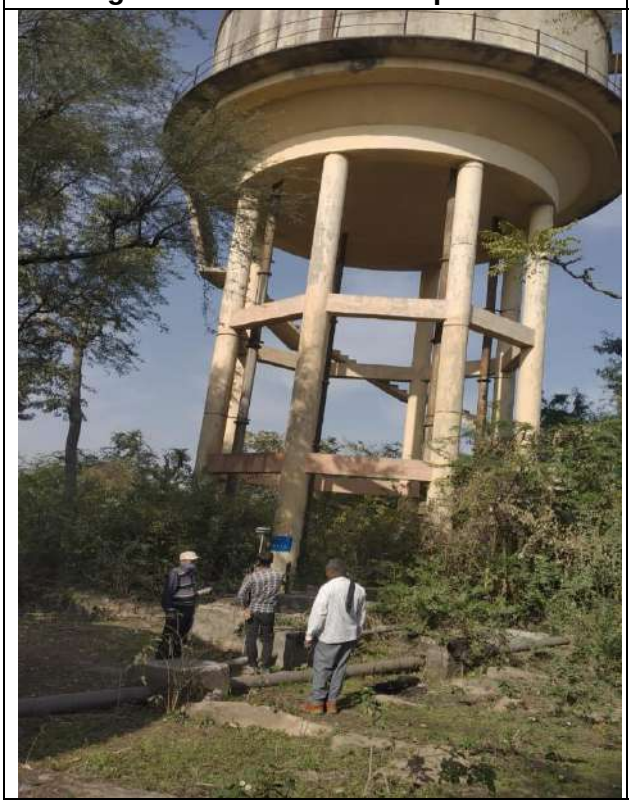


Fig. 6: : OSHR at Ganesh Takri	**Fig. 7 & 8:** OSHR and CWR at Nathuwas

Appendix 7: Details of Stakeholder Public consultations

A. Stakeholder consultation

a. City level Stakeholder Committee (CLC) Meeting (dtd. 06.08.2021) - A town-level stakeholder consultation meeting was conducted to discuss various issues like land availability, scope of works etc. under the chairmanship of District Collector in which representatives of primary and secondary stakeholders were invited. The feedback and concerns of the stakeholders have taken into consideration in detail designs of the project. City level Committee meeting was held on under the Chairmanship of District Collector, Rajsamand for finalization of works of Water Supply in Nathdwara town. Proposed works were approved by CLC members in this meeting. Minutes of Meeting of CLC vide dated are given below:

Order for CLC meeting

RUIDP

Government of Rajasthan

Office of Project Director

Rajasthan Urban Infrastructure Development Project(Unit of RUDSICO)

AVS Building, Jawahar Circle, JLN Marg, Jaipur - 302017

Tel No.: 0141-2721966, Fax No.: 0141-2721919,
email: mailruidp@gmail.com, mail.ruidp@rajasthan.gov.in web site : -https//urban.rajasthan.gov.in/ruidp

No. F3 (301) (60)/RUIDP/PMU/PH-IV/ ADB S. Safeguard /Gen adm./2020-21/11367 Date: 18/12/2020

Suprintending Egnleer/Executive Engineer
PIU- Abu Road, Sirohi, Ratangarh, Fatehpur, Laxmangarh, Sardarsahar, Kuchaman, Ladnu, Makrana, Didwana, Khetri, Mandawa, Pratapgarh and Banswara.

Subject:- **Nomination of Safeguard and Safety Officer (SSO) of each PIUs for proper monitoring of Environmental and Resettlement issues and addressing of safeguard related Grievances through Grievance Redress Mechanism.**

Reference: -Agreed Environmental Resettlement framework and EARF of RSTDSP.

All PIUs are directed to issue an office order to nominate one engineer from PIU to works as Safeguard and Safety Officer (SSO). It will be additional responsibility of Safeguard and Safety Officer (SSO), PIU to ensure day to day monitoring of implementation of Environmental Management and Monitoring Plan (EMMP) provisions, implementation & Monitoring Resettlement Plan (RP) and ADB Safeguard Policy& Safety compliance in concern town.

Further it is directed that all the PIU should maintain proper separate records of safeguard related Grievances received in their town and ensure that the safeguard related Grievances received are resolved as per Grievance Redress Mechanism (GRM) prescribed in EARF/RF which is summarized as under (for ready reference)

Methodology of multi-tier GRM	Responsibility/Action to be taken	Time Frame	Record Keeping
1st level: Grievances that are immediate and urgent in the perception of the complainant, the contractor, and supervision personnel from PIU and CMSC on-site will provide the most easily accessible or first level of contact for quick resolution of grievances	EE PIU will resolve issues in consultation with supervision personnel (ACM), Safeguard and Safety Officer (SSO) PIU, Contractor, and Safeguard staff of CMSC. If required, city level monitoring committee (CLMC) will be involved in resolution of grievances at the 1st level;	PIU will resolve issues within 7 days of receipt of a complaint/ grievance.	Safeguard Support of CMSC will oversee the matters and prioritize / follow up the issues with PIU/Contractor. Safeguard and Safety Officer of PIUs, Safeguard Support of CMSC will record Grievances timely in the format enclosed as Annexure 1. Contractor/ Safeguard Support of CMSC will enter the general Grievance received (in a summarized manner) in Grievance Register (format enclosed as Annexure 2) on receipt form public forwarded to head of PIU or Safeguard and Safety Officer (SSO) for resolve in time and provide summarized information as and when require. The grievance register will be endorsed by all field agencies involved in implementation of EMP and

Project Management and Capacity Building Consultancy ... RSTDSP (RUIDP-V)
Received on 21/12/2020 Inward No 1000

Shp 21/12/20

City Level Committee Minutes of Meeting held on 06.08.2021

RUIDP

राजस्थान सरकार
कार्यालय अधिशाषी अभियंता, उदयपुर
राजस्थान शहरी आधारभूत विकास परियोजना (आर.यू.आई.डी.पी.)

क्रमांक / आरयूआईडीपी / पीआईयू / उदयपुर / नाथद्वारा / सीएलसी / 2021–22 / 248–270 दिनांक: 06.08.2021

बैठक कार्यवाही विवरण

आरयूआईडीपी चतुर्थ चरण के अन्तर्गत नाथद्वारा, जिला–राजसमंद की जलप्रदाय योजना पर विस्तृत चर्चा हेतु जिला कलेक्टर, राजसमंद की अध्यक्षता में दिनांक 06.08.2021 को सिटी लेवल कमेटी की बैठक आयोजित की गई। बैठक में उपस्थित जनप्रतिनिधियों एवं अधिकारियों की सूची अनुच्छेद–अ पर संलग्न है।

आरयूआईडीपी द्वारा नियुक्त सलाहकार फर्म के द्वारा नाथद्वारा, जिला–राजसमंद की विस्तृत परियोजना रिपोर्ट बनवाई गई है जिसे आरयूआईडीपी के चतुर्थ चरण में लिया गया है। सलाहकार फर्म द्वारा प्रजेन्टेशन के माध्यम से योजना के अर्न्तगत किए जाने वाले कार्यों की विस्तृत जानकारी दी गई तथा सलाहकार फर्म द्वारा निम्नलिखित प्रस्तावित जलप्रदाययोजना के कार्यों पर प्रस्तुतिकरण दिया गया।

सलाहकार फर्म द्वारा प्रस्तावित जलप्रदाय योजना के अन्तर्गत नाथद्वारा क्षेत्र में **पानी की छीजत (NRW-Non Revenue Water)** को कम करने के साथ उचित दबाव के साथ 24 घंटे जल वितरण करने का प्रावधान रखा गया है। इस जल वितरण योजना के अन्तर्गत निम्नलिखित मुख्य कार्य प्रस्तावित किये गये है:–

- **इन्टेक वैल – 1 नं.**
- **वाटर ट्रीटमेन्ट प्लान्ट 11 एम.एल.डी.**
- **ट्रांसमिशन मेन–डीआई के–7 (100 एमएम से 400 एमएम व्यास) की पाईप लाईन–16.20 किमी.**
- **सी.डब्ल्यू.आर. : 1 नं0 (1500 KL)**
- **सी.डब्ल्यू.आर. : 1 नं0 (800 KL)**
- **डीस्ट्रीब्यूशन मैन–**
  - **डीआई के–7 (100 एमएम से 350 एमएम व्यास) पाईप लाईन–52.37 किमी**
- **हाउस सर्विस कनेक्शन – 5000 कनेक्शन**

उपरोक्त कार्यों की विस्तृत परियोजना रिपोर्ट की अनुमानित लागत राशि रूपये 65.54 करोड़ है (जिसमें लगभग 7.08 करोड रूपये की राशि 10 वर्ष संचालन एवं संधारण हेतु सम्मिलित है)। निर्माण कार्य पूर्ण होने के उपरांत संचालन व संधारण संवेदक द्वारा दिये गये दरों पर एवं पॉवर चार्जेज का भुगतान वास्तवित व्यय की राशि के आधार पर नगर पालिका, नाथद्वारा द्वारा वहन किया जाएगा।

बैठक में निम्न बिन्दूओं पर चर्चा एवं निर्णय लिया गया:–

1. **जल प्रदाय योजना के कार्य हेतु सभी लाईन एजेन्सीयों के साथ आवश्यक पत्राचार कर सभी स्वीकृति निविदा के पूर्व ही प्राप्त कर लेंवे ताकि कार्य के दौरान कोई व्यवधान एवं अनावश्यक समय व्यवतीत न हों।**

सिटी लेवल कमेटी की बैठक में सर्वसम्मति से जल प्रदाय योजना का अनुमोदन किया गया।

(नवीन कुमार सिंघल)
अधिशाषी अभियंता एवं
सदस्य सचिव सीएलसी,
आरयूआईडीपी, पीआईयू, उदयपुर

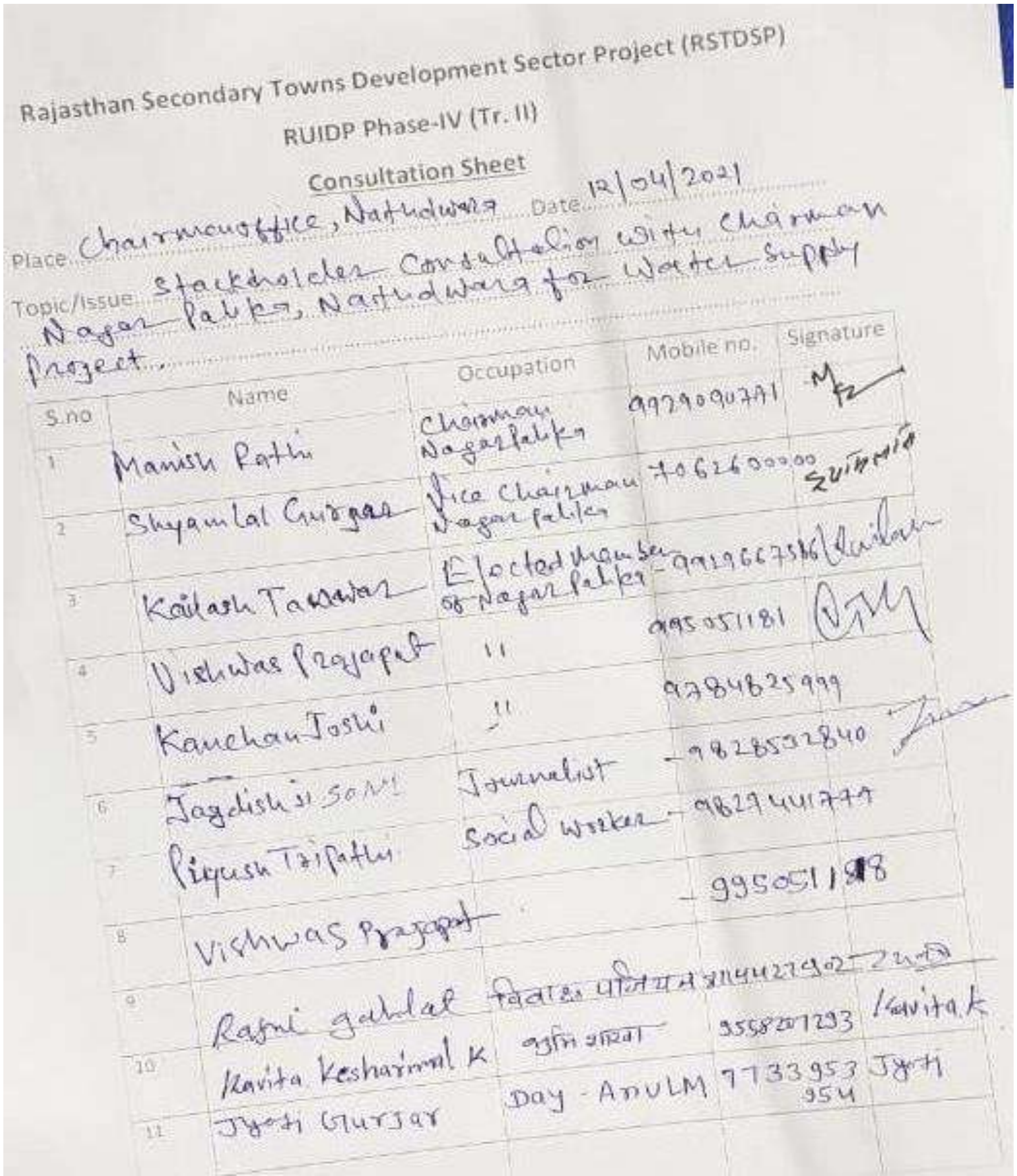
अनुच्छेद - (क)

06.08.2021 (शुक्रवार) को सायं: 03.00 बजे कलेक्ट्रेट, राजसमंद के सभागार में राजसमंद जिले के शहरी क्षेत्र नाथद्वारा में पेयजल आपूर्ति के पुर्नगठन हेतु डीपीआर तैयार कर सीटी लेवल कमेटी में अनुमोदन हेतु आयोजित बैठक में उपस्थित अधिकारी एवं सदस्यगण :–

क्र.सं.	नाम अधिकारी / सदस्यगण	पदनाम	हस्ताक्षर
1.	श्री अरविन्द कुमार पासवान,	Distt. Collector Rajsamand	
2			
3			
4			
5	श्री मनीष अरोड़ा	अधिक्षण अभियंता RUIDP	8003377650
6	श्री विनोद बिहारी शर्मा	अधीक्षण अभियंता PHED. राजसमंद.	9460926555
7	श्री शिशिर वार्ष्णेय	अधिक्षण अभियंता नगर परिषद राजसमंद	6/8/21
8	श्री मनीष राठी	चेयरमेन, नगरपालिका नाथद्वारा	
9	श्री कौशल कुमार कुशवाह	आयुक्त नगरपालिका; नाथद्वारा	6/8/21
10	नवीन सिंघल	XEN RUIDP Udaipur	9413350077
11	" राजकुमार सक्सेना	XEn. Projects Nathdwara	
12	" आलोक सक्सेना	AEn; नगरपालिका PHED नाथद्वारा	
13	" चन्द्र मोहन कोठारी	AEn; नगरपालिका नाथद्वारा	
14	" पवन शर्मा	JEn; PHED; नगरपालिका नाथद्वारा	
15	" दशरथ	M/s Excaltrack Jaipur.	
16	" अद्धम कुमार	— " —	
17			
18			

b. Meeting with Elected Chairman of Municipal Council and Elected Ward Member on 12.04.2022

Meeting with Nagar Palika Chairperson, Councilors and officials and discussion were done about proposed project under phase-4. Chairman and other Nagar Palika officers assured of their full cooperation with RUIDP/RSTDSP during planning and implementation of the project. Chairman told in the meeting that they will reuse of treated effluent in the plantation and landscaping on Do river bank. Photos and Signature sheet are given below:



Rajasthan Secondary Towns Development Sector Project (RSTDSP)

RUIDP Phase-IV (Tr. II)

Consultation Sheet

Place: Chairman office, Nathdwara Date: 12/04/2021

Topic/Issue: Stakeholder Consultation with Chairman Nagar Palika, Nathdwara for Water Supply Project

S.no	Name	Occupation	Mobile no.	Signature
1	Manish Rathi	Chairman Nagar Palika	9929090791	
2	Shyamlal Gurjar	Vice Chairman Nagar Palika	7062600000	
3	Kailash Tanwar	Elected member of Nagar Palika	9929667586	
4	Vishwas Prajapat	"	995051181	
5	Kanchan Joshi	"	9784825999	
6	Jagdish ji Soni	Journalist	9828532840	
7	Piyush Tripathi	Social worker	9829441777	
8	Vishwas Prajapat		995051198	
9	Rajni gahlot	[illegible]	[illegible]	
10	Kavita Kesharmal K	[illegible]	9558207293	Kavita K
11	Jyoti Gurjar	Day - NULM	7733953954	Jyoti

c. Meeting with AEN PHED at Ganesh Takri on 12.04.2022

A meeting with Assistant Engineer PHED Headworks Ganesh Takri " Mr. Naresh (Mobile No. 9461003738) was contructed and he told that in this campus we have a GSLR and a CWR. GLSR is not in use but CWR is still in working. In the surrounding Ganesh Takri Colony is the nearest habitation at 100m distance.

d. Meeting with WTP In charge "Mr. Bhairon Singh" (Mobile No. 9929302493) at Nand Samand Dam on 12.04.2022

A meeting with Assistant Engineer PHED Headworks Ganesh Takri " Mr. Naresh (Mobile No. 9461003738) was conducted. He told that there are two storage namely GSLR and a CWR. GLSR is not in use but CWR is still in working. In the surrounding of Ganesh Takri, Ganesh Colony is the nearest habitation at 100m distance.

e. Telephonic Discussion with Deputy Conservator of Forest Office, Rajsamand

A telephonic meeting was conducted with DCF Rajasamand (Telephone number: 2952 223813) and discussed about following points:- i) Forest blocks location in Nathdwara town ii) existing water laying site in forest iii) impact of laying on forest trees iv) To finalisation of rising main alignment in forest areas to reduce the impacts on trees. During the meeting DCF office told about forest areas locations and tree species, wildlife and process of finalization of aligment and joint measurement survey.
Outcomes of the Meeting: i) Proposed rising main line is passing through the forest area and number of impacted trees and forest area will be decided after joint site visit with

forest dept. ii) there are no wildlife protected area within the 10 km radius of proposed components so there will be no requirement of special wildlife mitigation measures.

f. Telephonic Discussion with Srinath Ji Temple Management Committee

A telephonic meeting was conducted with Srinath ji temple Management Committee (Telephone number: 02953-232482) and discussed about following points:- i) Time of Fair of Srinath Ji temple, Boundary of the Temple, ii) Location of the Temple asserts in Nathdwara, iii) Boundary of the Temple Campus, iv) Opening and Closing time the Temple, v) Peak hour of Pilgrims arriving into the Temple, vi) Day, Hour, Months in which total number of Pilgrims is low.

Outcomes of the Meeting: i) Main fair of Srinath Ji Temple, is held on Krishana Janmastami festival so during this festival excavation and laying work will be closed in the adjoining area of the Temple boundary. In the morning and evening time public gathering is high therefore adequate safety measures will be taken during the construction in the nearby locations of Srinath Ji Temple.

B. Consultations during Social and Environmental Impact Assessment

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

Details of Public Consultations in Nathdwara

A. Pubic Consultation with locality

Date and Location	Participants			Topic Discussed	Outcome	Photographs
	Total	Male	Female			
11.04.2022 Near Bus Stand Area, Nathdwara	12	06	06	Project components under RSTDSP and the benefits to theCommunity. 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 forimproved services. Source of water pollution in the city.	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.	
11.04.2022 Govind Chowk and Teilpura Circle, Nathdwara	11	07	04	Project components under RSTDSP and the benefits to theCommunity. 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 forimproved services. Nearest wildlife and forest area.	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.	

12.04.2022 Fauzi Mohalla, Nathdwara	08	08	00	Project components under RSTDSP and the benefits to theCommunity. 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.	
12.04.2022 Near Srinath Ji Temple, Nathdwara	06	06	06	Project components under RSTDSP and the benefits to theCommunity. Present status and access of Water Supply and drinking water facilities in the town and other concerned issues and challenges. Temporary Impact of Proposed Project on Temple.	Adequate Safety Measures shold be taken during construction phase.	

12.04.2022 Near Keshav Complex, Nathdwara	06	06	06	Willingness of local public to pay forimproved services.	Participants are happy with proposed project and are willing to pay for improved sewerage services in the town.	
12.04.2022 Nagar Palika, Nathdwara	11	09	02	Proposed water supply works and availability of land, requirement of No objection etc	Meeting with Nagar Palika Chairperson, Councilors and officials and discussion were done about proposed project under phase-4. Chairman and other Nagar Palika officers assured of their full cooperation with RUIDP/RSTDSP during planning and implementation of the project	

13.04.2021	**30**	**25**	**05**	Impact of Proposed Project on Locality and Wildlife	Consultation with local Local Resident of Gansh Takri Colony and discussion about impact of construction activities taken under proposed project on forest cover and wildlife.	
13.04.2021	**20**	**0**	**20**	General discussion about proposed project components and forest area in the town	Consultation with local Local Resident near Bhandari Bawri, Nathdwara and locality told about forest area in the Nathdwara town, discussed about minimum utilization of forest area.	

14.04.2021	18	0	18	Project components under RSTDSP and the benefits to theCommunity. 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 forimproved services.	Consultation with local Local Resident near Nathuwas Colony. Pipeline laying work for water supply is proposed in the area and it was informed by nearby habitation that water facility is provided byconcerned 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.	

Attendance sheet of Public consultation at

A. : Near Bus Stand

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

Consultation Sheet

Place: [illegible] Town: [illegible] Date: 11/04/2022

Topic Discussed During Consultation:

1. [illegible]
2. [illegible]

S. No.	Name	Gender		Address	Contact No.	Signature
		Male	Female			
1	देवीलाल	✓		बस स्टेण्ड		देवीलाल
2	उगमसिंह	✓		— " —		उगमसिंह
3	सोहनलाल	✓		— " —		Sohanlal
4	रेखा देवी		✓	— " —		
5	पूनम देवी		✓	— " —		[signature]
6	पुखराज		✓	बस स्टेण्ड के नजदीक		[thumbprint]
7	मोहनसिंह	✓		— " —		[thumbprint]
8	नाथू कुमार	✓		— " —		[illegible]
9	रामूसिंह	✓		— " —		रामूसिंह
10	रजनी		✓	— " —		Rajnee
11	सन्तोष देवी		✓	— " —		संतोष
12	कुलीबाई		✓	— " —		[thumbprint]

B. : Near Bus Stand

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

Consultation Sheet

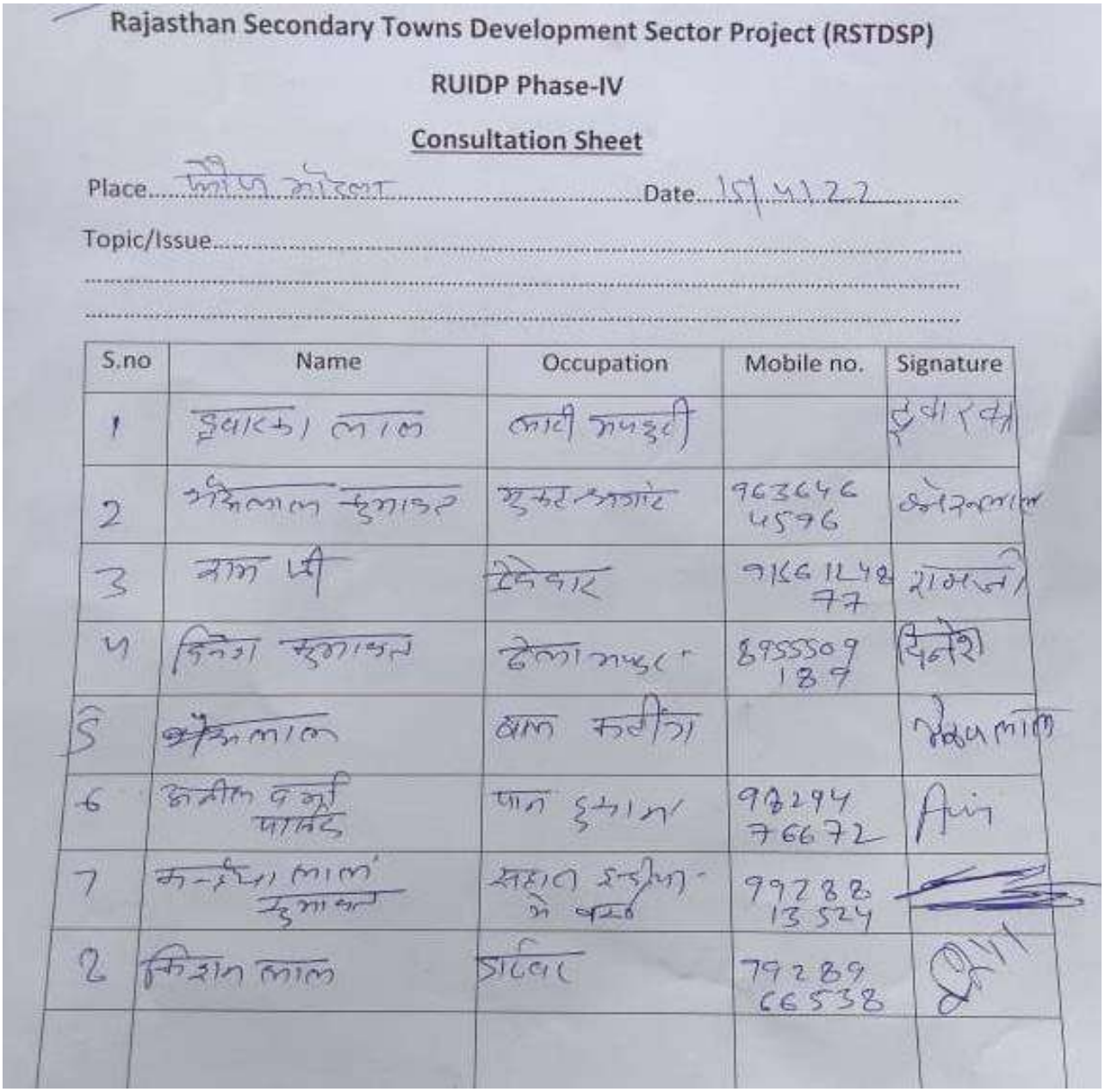
Place: Govind Chowk & Telipura Town: Nathdwara Date: 11/04/2022

Topic Discussed During Consultation:

1. शहर में सीवरेज की व्यवस्था से संबंधित
2. सिवरेज घर तक लगावें।

S. No.	Name	Gender		Address	Contact No.	Signature
		Male	Female			
1	दिनेशसिंह	✓		गोविन्द चौक		Dinesh
2	शाकिर हुसैन	✓		— " —		साकिर
3	बाबूलाल	✓		— " —		
4	कन्हैया	✓		— " —		कन्हैयालाल
5	उम्मेदसिंह	✓		— " —		
6	गुलाब बाई		✓	तेलीपुरा मस्जिद		
7	शांति बाई		✓	— " —		
8	उमा देवी		✓	— " —		
9	गोपालाल	✓		— " —		
10	उम्मेद सिंह	✓		— " —		उम्मेदसिंह
11	रुकमणी		✓	— " —		

C. : Near Bus Stand, Nathdwars



Rajasthan Secondary Towns Development Sector Project (RSTDSP)

RUIDP Phase-IV

Consultation Sheet

Place: [illegible] Date: 15/4/22

Topic/Issue: .....

S.no	Name	Occupation	Mobile no.	Signature
1	[illegible]	[illegible]		[illegible]
2	[illegible]	[illegible]	963646 4596	[illegible]
3	[illegible]	[illegible]	9166 1248 77	[illegible]
4	[illegible]	[illegible]	8955509 189	[illegible]
5	[illegible]	[illegible]		[illegible]
6	[illegible]	[illegible]	98294 76672	[illegible]
7	[illegible]	[illegible]	99288 13524	[illegible]
8	[illegible]	[illegible]	79289 66538	[illegible]

D. : Near Keshav Complex, Nathdwara

Rajasthan Secondary Towns Development Sector Project (RSTDSP)

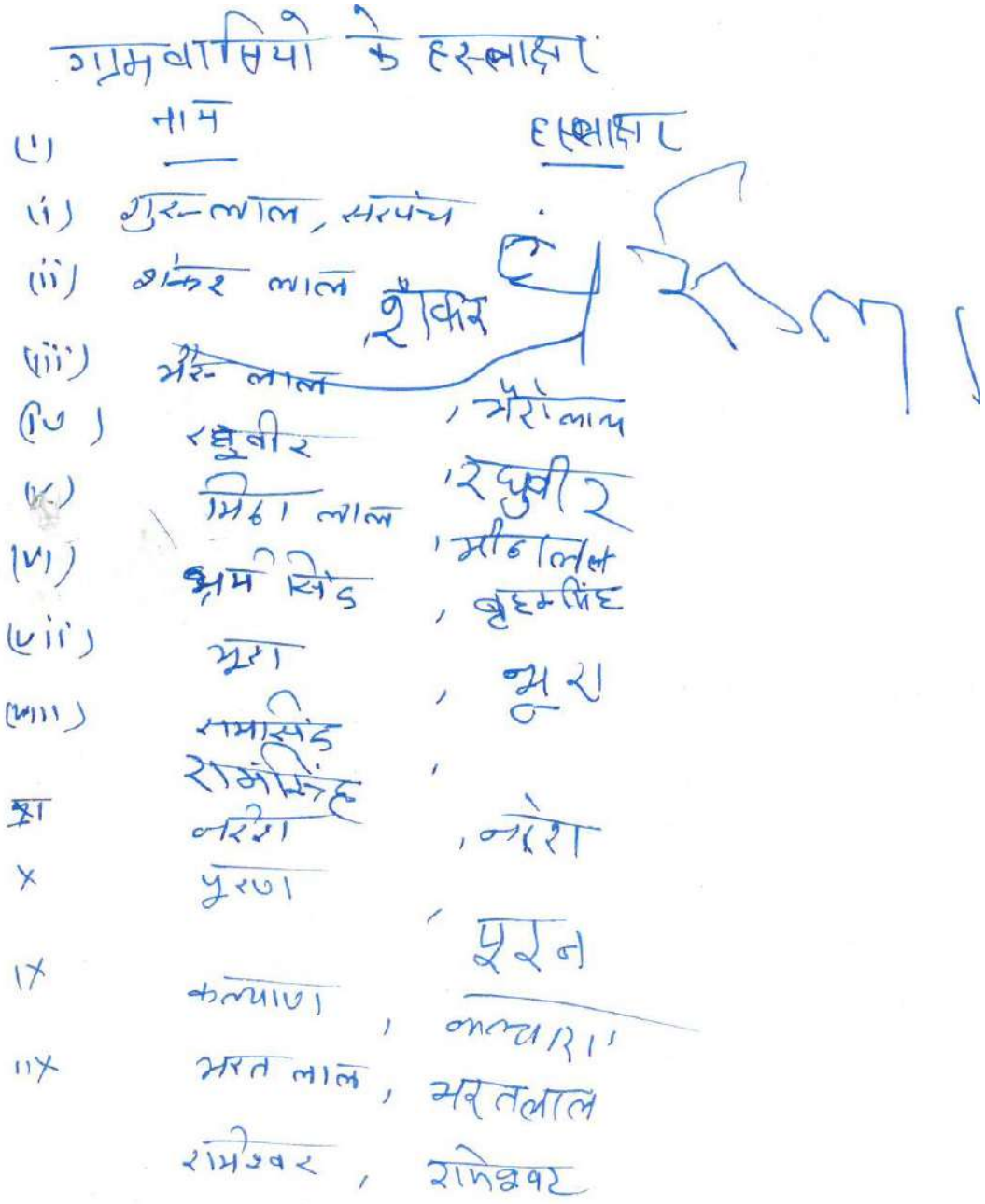
RUIDP Phase-IV

Consultation Sheet

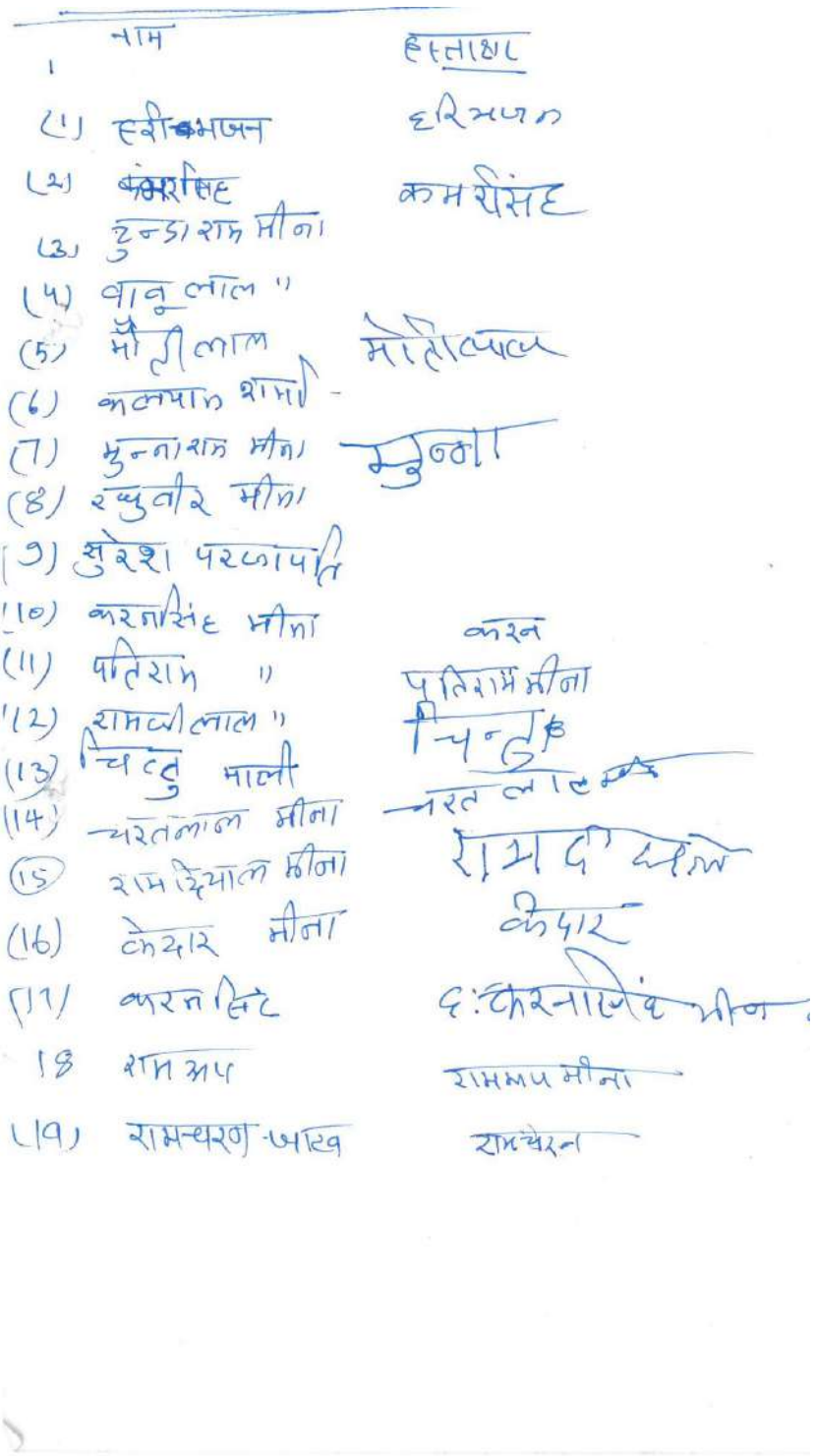
केशव कॉम्प्लेक्स नाथद्वारा

1	[illegible]	[illegible]	9928347872	[illegible]
2	[illegible]	[illegible]	9950171347	[illegible]
3	[illegible]	[illegible]	9998736128	[illegible]
4	[illegible]	[illegible]	9929219377	[illegible]
5	[illegible]	4	9929048081	[illegible]
6	[illegible]	[illegible]	9001958532	[illegible]

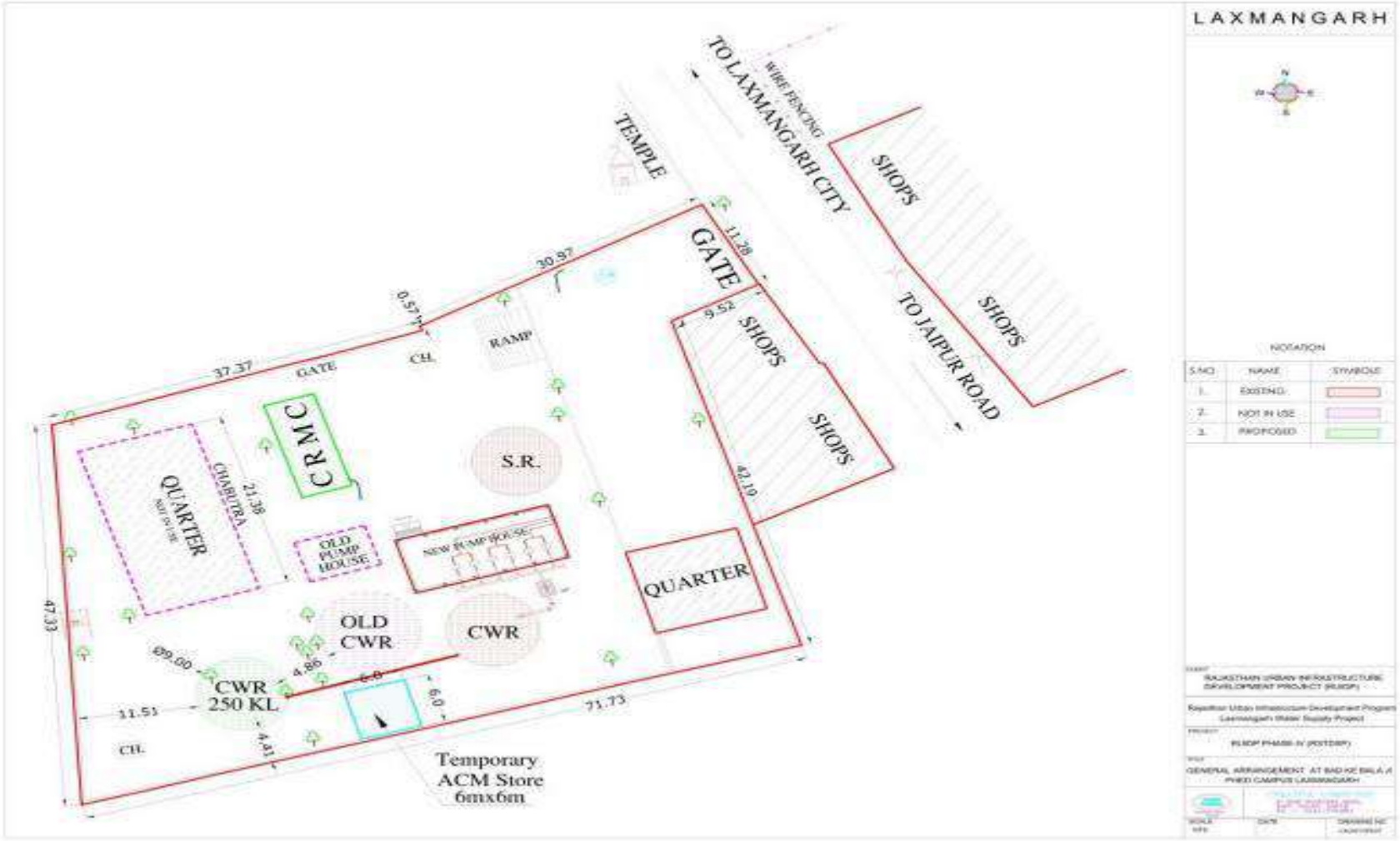
E. : Near Gansh Takri, Nathdwara



F. : Near Gansh Takri, Nathdwara



Appendix 8: Layout of CWR showing storage area for asbestos material



Appendix 9: Source Sustainability Report of Nand Samand Dam

Selection of water source. An alternative source analysis has been conducted to select a feasible and sustainable source of water supply to meet the ultimate design demand of Nathdwara town. Two alternatives: (i) Ground water; (ii) Nand Samand Dam were studied, and Nand Samand Dam is selected based on the techno-economic and environmental considerations as elucidated below.

(i) **Ground Water Source:** Presently Nathdwara water supply is only partly based on ground water. There is 1 tube wells in Balawaton ka Kheda area and 2 open wells in Bhrampuri nathuwas and Meera Nagar. Water from these wells are used for the above mentioned areas only.

(ii) **Nand Samand Dam:** Nand Samand Dam which was constructed in the year 1957 by irrigation department, is about 4.4 Km from Nathdwara town. This earthen dam was constructed across Banas River the top level of the dam is 584.30 above msl. It has an upstream slope of 3:1 and a downstream slope of 2:1.

a) **Location: -** Located at the coordinates 24°55'56.63"N, 73°46'49.19"E, Nand samand Dam is 4.4 KM away from Nathdwara town. It has a length of 127 KM up to the it's site.

b) **Catchment Area:** - The dam has a gross storage capacity, live storage capacity and catchment area of 21.225 MCM, 20.631 MCM and 829.00 Sq.km respectively (Refer Fig 01).

c) **Irrigation capabilities: -** Nand samand Dam is an irrigation dam across the river Banas, it has a gross command area of 8702 ha, a culturable command area of 7885.00 ha and a Irrigable area of 3255 ha. The total annual Irrigable area during Karif plantation is 800.00 Ha and 2304 ha during Rabi plantation. Total 2985 farmers of 32 villages around Nathdwara are benefitted by the dam through a right main canal of 29.4 km length, Left Main canal of 0.14 km.

d) **Selection of Site:-** The site was selected looking atholy place Nand samand Dam. It was constructed to facilitate pilgrims who came here for their rituals. River storage water also provide irrigation facilitate of both banks of the river. Submergence area is within limits of the river banks.

e) **Climate:-** The site is situated in sub-tropical, sub humid to humid climate conditions characterized by mild winter and moderate summers with high relative humidity during the month of July to September. The area experience mean monthly minimum temperature ranging from 9º-16.4ºc (January) to 25-36ºc (June) and mean monthly maximum temperature ranges from 16ºc (January) to 35ºc (May) with some times goes up to 40ºc.

f) **Rainfall:-** The catchment area of the dam is 829.00 sq. km.. This area receives an annual average rainfall being 545 mm with maximum annual average of 1005 mm in year 1973 and minimum annual average rainfall of 254 mm in 1974.

g) **Runoff:** - As per the available data, the Dam has a mean annual runoff of 8880.00 ha m and the design flood rate of about 3240.00 ha m.

h) **Submergence**: - Gross Storage of the dam is 21.225 MCM. The submergence area at dead storage level is 28.00 ha and the same at full reservoir level is 472.00 ha.

As there is no other reliable source in the vicinity of town. This dam is already serving Nathdwara for its existing requirement of 4.1 MLD. Given the dependability, sustainability and government permissions, the Nand Samand Dam is selected as water source for Nathdwara town water supply scheme. It has sufficient amount of storage capacity of water to serve the people of Nathdwara up to ultimate year i.e. 2055 as 150 mcft (i.e. 11.64 MLD) has been assigned for Nathdwara water supply and the required water quantity for the year 2055 is 11.1 MLD i.e 141.77 mcft.

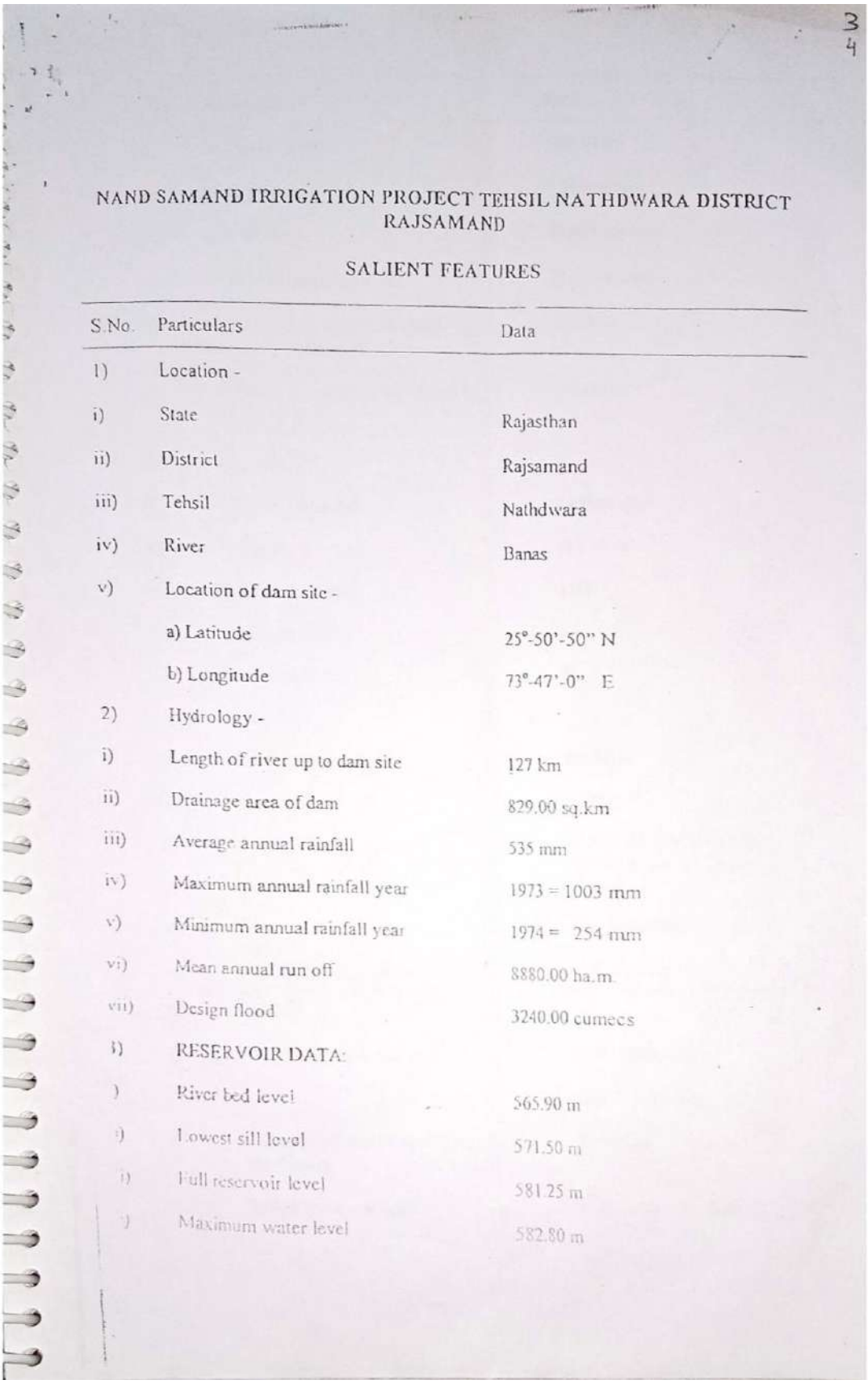
Table 1: Yearly Rainfall Data of Nathdwara town for last 50 years

YEAR	Total Rain fall	January	February	March	April	May	June	July	August	September	October	November	December	Avg. Rain fall
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1971	**527.6**	0	0	0	0	15.5	116	267	114.5	14	0	0	0	**43.97**
1972	**358.7**	0	0	0	0	0	130	13.1	215.3	0	0	0	0	**29.89**
1973	**1005.6**	0	0	0	0	0	106	198	467.6	234	0	0	0	**83.80**
1974	**255**	0	0	0	2	16	22	92	53	31	39	0	0	**21.25**
1975	**718**	0	0	0	0	0	63	225	193	208	29	0		**65.27**
1976	**518**	36	0	0	0	0	58	119	190	55	0	60	0	**43.17**
1977	**671**	16	0	0	0	32	129	325	123	46	0	0	0	**55.92**
1978	**616**	0	34	0	0	0	60	222	174	10	56	24	36	**51.33**
1979	**533**	0	13	0	0	56	54	189	101.6	8.2	12	98.8	0	**44.42**
1980	**622**	0	0	0	0	0	240	207	34.3	114	0	0	27	**51.83**
1981	**543**	0	0	0	0	4.8	35	107	230.6	109	0	56.4	0	**45.25**
1982	**421**	7	0	0	6.3	39.4	26.4	79	119.2	-	0	144	0	**38.27**
1983	**737.8**	0	0	0	17	3	172	206	161.3	151	28.4	0	0	**61.48**
1984	**434.3**	0	0	0	0	0	18.8	194	188.8	32.6	0	0	0	**36.19**
1985	**491**	0	0	0	9.2	32	2.4	71.8	312.4	13.2	47	0	3	**40.92**
1986		0	0	0	0	0	0	0	0	0	0	0	0	**0.00**
1987	**271.6**	14	0	0	0	0	77.1	80.5	96	4	0	0	0	**22.63**
1988	**451.8**	0	0	0	0	0	48	219	97	87.8	0	0	0	**37.65**
1989	**498.5**	4	0	0	0	0	78	161	205.5	50.5	0	0	0	**41.54**
1990	**681.7**	0	3	0	0	14.2	68.1	139	321.2	133	3	0	0	**56.81**
1991	**559**	0	0	0	15	0	59.4	394	77	14	0	0	0	**46.58**

YEAR	Total Rain fall	January	February	March	April	May	June	July	August	September	October	November	December	Avg. Rain fall
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1992		0	0	0	0	0	0	0	0	0	0	0	0	**0.00**
1993	**455**	0	0	0	11	0	62	212	62	71.5	36.5	0	0	**37.92**
1994		0	0	0	0	0	0	0	0	0	0	0	0	**0.00**
1995	**411**	20	0	0	0	0	7	221	70	50	35	0	8	**34.25**
1996	**600**	11	0	0	0	0	86	320	127.5	56	0	0	0	**50.00**
1997		0	0	0	0	0	0	0	0	0	0	0	0	**0.00**
1998	**474**	0	0	0	5	0	89	43	139	122	67	9	0	**39.50**
1999	**443**	0	8	0	0	0	110	110	91	98	26	0	0	**36.92**
2000	**321**	0	0	0	8	17	10	145	107	34	0	0	0	**26.75**
2001	**815**	0	0	0	0	21	96	478	189	31	0	0	0	**67.92**
2002	**339**	0	0	0	0	0	89	0	147	101	0	0	2	**28.25**
2003	**403**	0	32	0	0	0	34	78	160	99	0	0	0	**33.58**
2004	**441**	0	0	0	0	0	37	83	254	45	22	0	0	**36.75**
2005	**1004**	0	0	0	6	0	54	235	310	399	0	0	0	**83.67**
2006	**774**	0	0	13	0	11	97	177	405	71	0	0	0	**64.50**
2007	**591**	0	10	3	0	5	47	343	144	39	0	0	0	**49.25**
2008	**345**	0	0	4	9	38	42	78	70	104	0	0	0	**28.75**
2009	**595**	0	0	4	0	0	122	361	99	0	4	5	0	**49.58**
2010	**955**	2	0	0	0	0	15	223	347	161	0	201	6	**79.58**
2011	**783**	0	0	0	0	0	33	146	398	206	0	0	0	**65.25**
2012	**548**	0	0	0	1	63	5	69	197	213	0	0	0	**45.67**
2013	**636**	0	7	0	0	0	81	255	176	83	34	0	0	**53.00**

YEAR	Total Rain fall	January	February	March	April	May	June	July	August	September	October	November	December	Avg. Rain fall
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
2014	**560**	14	0	0	11	24	0	176	225	110	0	0	0	**46.67**
2015	**598**	10	0	41	3	4	188	247	90	15	0	0	0	**49.83**
2016	**989**	0	0	0	0	0	113	244	467	53	112	0	0	**82.42**
2017	**994**	0	0	0	0	22	120	591	158	103	0	0	0	**82.83**
2018	**452**	0	0	0	0	0	47	219	138	48	0	0	0	**37.67**
2019	**750**	0	0	0	15	5	75	158	326	130	41	0	0	**62.50**
2020	**808**	0	0	39	15	15	121	159	328	108	23	0	0	**67.33**
2021	**808**	0	0	0	0	74	119	57	105	365	3	67	18	**67.33**

Salient Feature of Nand Samand Dam



NAND SAMAND IRRIGATION PROJECT TEHSIL NATHDWARA DISTRICT RAJSAMAND

SALIENT FEATURES

S.No.	Particulars	Data
1)	Location -	
i)	State	Rajasthan
ii)	District	Rajsamand
iii)	Tehsil	Nathdwara
iv)	River	Banas
v)	Location of dam site -	
	a) Latitude	25°-50'-50" N
	b) Longitude	73°-47'-0" E
2)	Hydrology -	
i)	Length of river up to dam site	127 km
ii)	Drainage area of dam	829.00 sq.km
iii)	Average annual rainfall	535 mm
iv)	Maximum annual rainfall year	1973 = 1003 mm
v)	Minimum annual rainfall year	1974 = 254 mm
vi)	Mean annual run off	8880.00 ha.m.
vii)	Design flood	3240.00 cumecs
3)	RESERVOIR DATA:	
)	River bed level	565.90 m
i)	Lowest sill level	571.50 m
i)	Full reservoir level	581.25 m
)	Maximum water level	582.80 m

33

S No	Particulars	Data
v)	Top bund level	584.30 m
vi)	Dead storage	0.594 mcum
vii)	Live storage	20.631 mcum
viii)	Gross storage up to FTL	21.225 mcum
ix)	Area of submergence at dead storage level RL 571.50 m	28.00 ha
x)	Area of submergence of FRL RL 581.25 m	472.00 ha
4)	Type of Dam -	
i)	Total length of dam	Earthen dam
ii)	Top level	584.30 m
iii)	Top width of dam	3.00
iv)	Upstream slope	3:1
v)	Downstream slopes	2:1
5)	Waste Weir -	
i)	Length of waste weir	481.60 m
ii)	Length of bye wash	23.80 m
iii)	Gated spillway (existing)	10 Nos of size 3 x 2.5 m
	Proposed Additional gates	33 Nos 9.0 m x 3.3 m
iv)	Height of waste weir	3 Nos
v)	Type	Waste Weir Fall
	observed	
vi) a)	Maximum discharge of weir	3240 cumecs (
b)	Revised flood discharge	9287 cumecs (Computed by CWC).
6)	Canals -	
i)	Length of main canal	RMC 29.40 km
		LMC 0.14 km
ii)	Discharge of minors and distributary	16.50 km
iii)	Design section at head	Bed width = 5.00 m

7)	Irrigation -	
i)	Gross command area	8702.00 ha
ii)	Culturable command area	7885.00 ha
iii)	Irrigable area	3255.00 ha
iv)	Intensity (on average total CCA)	
	a) Kharif	10.14%
	b) Rabi	29.22%
v)	Area irrigated annually during Kharif (existing)	800.00 ha
vi)	Area annually irrigated during rabi (existing)	2304.00 ha
vii)	No. of farmers benefited	2985
viii)	No. of villages under command area	32 Nos.
ix)	Name of villages under command area	1) Nathdwara 2) Nichali Oden 3) Balawaton-Ka- Kheda 4) Modwa 5) Khokka Dhani 6) Kotariya 7) Dhani Rebariyan 8) Panerion Ki Madri 9) Namana 10) Nenpuria 11) Fulpura 12) Banka Ka Guda 13) Sanga Kheda 14) Kiyawas 15) Bijinol 16) Kunwaria Kheda 17) Bhatoli 18) Menthia Kala 19) Nakli 20) Fateh Nagar Ka Kheda 21) Sathana 22) Fukhia 23) Turkia Kheda 24) Pipli Dodiyan 25) Oda

26) Dungaon
27) Teppura
28) Fatehnagar
29) Jodhpuria
30) Amloi
31) Fatehpura
32) Rajawas

सहायक अभियन्ता
जल संसाधन उपखंड नाथद्वारा

Water received in Nandsamand Dam during past 30 years

S.No.	Year	Water received in tank (Mcum)
1	1992-93	21.22
2	1993-94	21.22
3	1994-95	21.22
4	1995-96	21.22
5	1996-97	21.22
6	1997-98	21.22
7	1998-99	5.35
8	1999-2000	11.15
9	2000-01	11.15
10	2001-02	21.22
11	2002-03	-
12	2003-04	19.64
13	2004-05	4.81
14	2005-06	21.22
15	2006-07	21.22
16	2007-08	19.36
17	2008-09	-
18	2009-10	-
19	2010-11	21.22
20	2011-12	21.22
21	2012-13	21.22
22	2013-14	9.97
23	2014-15	21.22
24	2015-16	21.22
25	2016-17	21.22
26	2017-18	21.22
27	2018-19	3.38
28	2019-20	21.22
29	2020-21	21.22
30	2021-22	4.25

Assistant Engineer
Water Resource Sub-Division
Nathdwara

Yearly lowest gauge and corresponding capacity of Nandsmand Dam					
S.No	**Year**	**Lowest gauge of dam (ft)**	**Capacity at lowest gauge (Mcft)**	**Maximum storage (Mcft)**	**Net water Received/ strored in reservoir (Mcft)**
	Col (2)	**Col (3)**	**Col (4)**	**Col (5)**	**Col (6)**
1	2007-08	6.40	64.00	217.39	686.00
2	2008-09	-	-	131.98	750.00
3	2009-10	-	-	330.41	750.00
4	2010-11	-	-	400.00	750.00
5	2011-12	5.50	53.00	400.00	697.00
6	2012-13	-	-	297.46	750.00
7	2013-14	-	-	261.21	380.00
8	2014-15	5.50	53.00	320.52	697.00
9	2015-16	7.55	73.50	400.00	676.50
10	2016-17	4.80	43.60	400.00	706.40
11	2017-18	4.75	43.25	284.28	706.75
12	2018-19	3.00	30.00	400.00	121.00
13	2019-20	-	-	750.00	750.00
14	2020-21	9.25	92.50	217.39	657.50

Nand Samand Dam water sustainability and environmental considerations. The live storage capacity Nandsamnd Dam is 20.631 MCM and gross storage capacity is 21.225 MCM, out of this 150 mcft i.e. (11.64 mld) of water has been assigned for Nathdwara, while the water requirement of ultimate year (2055) for the project is 11.1 MLD or 141.6 mcft er year, which is about 20.58 % of live storage capacity of Nand Samand dam, which is adequate to meet the project yearly demand of the design year. Also, during the dry summer months, the drawl would be miniscule compared to the water storage available. Executive Engineer PHED Water Resources Department (Rajasamand) has given assurance that 150 mcft Nand Samand water will be availability of for drinking purposes in present and future uses. Executive Engineer PHED Water Resources Department (Rajasamand) assurance letter is given below:-

कार्यालय अधिषाषी अभियन्ता जल संसाधन खण्ड राजसमन्द

क्रमांक :– 3264 दिनांक :– 09/03/2022

आयुक्त
नगर पालिका नाथद्वारा

विषय :– नन्दसमन्द बांध में पेयजल हेतु आरक्षित पानी की मात्रा बाबत्।
सन्दर्भ :– आपके कार्यालय के पत्र कमांक/ष.ज.प्र.यो./2021–22/
9725–9726 दिनांक 05.03.2022

उपरोक्त विषय में लेख है कि नन्दसमन्द बांध से जल की उपलब्धता एवं मांग के आधार पर पेयजल हेतु प्रतिवर्ष जल वितरण समिति द्वारा वर्षा ऋतु समाप्ति के उपरान्त बैठक निर्णय अनुसार नाथद्वारा शहर की पेयजल आपूर्ति हेतु पानी आरक्षित किया जाता है। इस वर्ष आपके द्वारा की गई मांग अनुसार 150 mcft पानी पेयजल हेतु आरक्षित किया गया है। विगत वर्षों में आरक्षित पानी का विवरण निम्नानुसार है:–

क्र.सं.	बांध का नाम	वर्ष	आरक्षित पानी की मात्रा	Remark
1	नन्द समंद बाँध	2019–20	150 mcft	
2		2020–21	150 mcft	
3		2021–22	150 mcft	

आगामी वर्षों में भी नाथद्वारा शहर की पेयजल आपूर्ति हेतु पानी की मात्रा मांग अनुसार 150 mcft जल वितरण समिति के निर्णयानुसार आरक्षित रहेगी।

अधिषाषी अभियन्ता
जल संसाधन खण्ड राजसमन्द

क्रमांक :– 3265 दिनांक :– 09/03/2022

प्रतिलिपी सहायक अभियन्ता जल संसाधन विभाग उपखण्ड नाथद्वारा को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित है।

अधिषाषी अभियन्ता
जल संसाधन खण्ड राजसमन्द

OFFICE OF EXECUTIVE ENGINEER WATER RESOURCES SECTION RAJSAMAND

S.No:- 3264 **Date: 09/03/2022**

Councilor

Municipal Council, Nathdwara

Subject: - Water availability in the Nand Samand Dam.

Regarding: - Office Letter S. No/ -------/2021-22/9725-9726 date 05.03.2022

As mentioned in the above letter on the basis of availability and demand of drinking water from Nand Samand Dam, Every year water is reserved by the water supply committee at the end of monsoon to fulfill the drinking water demand of the Nathdwara city. This year a demand to reserve 150 mcft of water was made by you for drinking water purpose. The details of the reserved water quantity in the past years is as follow:

S. No	Name of the Dam	Year	Quantity of Reserved Water	Remarks
1	**Nand Samand Dam**	2019-20	150 mcft	
2		2020-21	150 mcft	
3		2021-22	150 mcft	

In the coming years 150mcft of water will be reserved by the water supply committee to fulfill the drinking water demands of Nathdwara city.

Executive Engineer

Water Resource Section

Rajsamand

S. No:- 3265 Date:- 09/03/2022

Copy to:- Assistant Engineer Water Resource Department Nathdwara, Forwarded for information and necessary action.

Executive Engineer

Water Resource Department,

Rajsamand

Nand Samand Dam Water quality. Catchment area of the dam is spread over 829.00 sq. km. The catchment area is mostly characterized by agricultural and barren lands, and forest areas. There is no polluting source like industry or mining in the catchment areas or town situated in this patch of river, only agriculture fields are found. Habitations are limited to small villages. Therefore, no significant impacts on surface water quality envisaged. Water quality sampling not done by DPR Consultant and water quality data of Nathsamand Dam constructed Banas River is not available at this stage, it will be done during detailed design by DBO Contractor; and surface water quality monitoring has been including in monitoring plan. However, convention water treatment and disinfection which is proposed in the project is adequate to make the water usable for drinking purposes. A regular water quality regime needs to be established for checking the raw water quality. The water supplied to the consumers at all-time must meet the drinking water standards.

CHEMICAL ANALYSIS REPORT

PHED/ Lab/Chem /2021-22/ 927 Date :- 26/11/2021

TO,
A.E.N
PHED Sub Div Nathdwara (Urban)

Reference :- Your letter no 336-339 Dated :- 17.11.2021
Date of receipt of samples 18.11.2021

L S NO	VILLAGE	Particulars of sources & LOCATION	pH	CHLORIDE	NITRATE	TDS	FLUORIDE	ALKALINITY	TOTAL HARDNESS	TURBIDITY	ALUM DOSE	CHLORINE DOSE
461	NATHDWARA	RAW WATER FILTER PLANT NANDSAMAND	8.60	110	3	378	0.53	240	210	12.3	40	8.0
462	NATHDWARA	CWR FILTER PLANT NANDSAMAND	8.49	120	3	400	0.51	220	220	4.1	-	-
463	NATHDWARA	CWR IMLI CHOCK	8.22	160	3	477	0.39	200	260	4.3	-	-
464	NATHDWARA	CWR GANESH TEKARI	8.01	120	3	448	0.50	230	220	5.6	-	-
465	NATHDWARA	CWR NATHUWAS	8.13	120	3	440	0.55	220	240	5.3	-	-

ALL PARAMETERS ARE IN Mg/L EXCEPT pH and Turbidity

Sample Was Not Collected
By This Laboratory.

JUNIOR CHEMIST,
P.H.E.D. LAB. RAJSAMAND

PHED/ Lab/Chem /2021-22/ Date :-

Copy Submitted to the Ex.-En. P.H.E.D. Division Rajsamand

JUNIOR CHEMIST,
P.H.E.D. LAB. RAJSAMAND

Figure 2- Water Quality Report of Nand Samand Dam