Sahiwal Regional Development Plan
Water Supply & Sanitation

January 2024

Scope of Planning

1. Condition Assessment of WSS Assets
2. Rehabilitation of Urban & Rural WSS Infrastructure
3. Replacement & Upgradation of Poorly Served & Outlived WSS Piped Network
4. Extension to the Unserved Areas for WSS Services
5. Wastewater Treatment
6. Machinery Requirement Proposal
7. Drawing and Design of Wet Utilities

TERM	YEARS	PLANNING YEAR
Short	2	2026
Medium	5	2029
Long	10	2034

Design Period of 10 Years (Up to 2034) with further projects prioritization of 2, 5, & 10 Years

Approach And Methodology

No. of Field Visits: 02

10th December – 11th December 2023

1st January – 06th January 2024

Total Working Days: 180

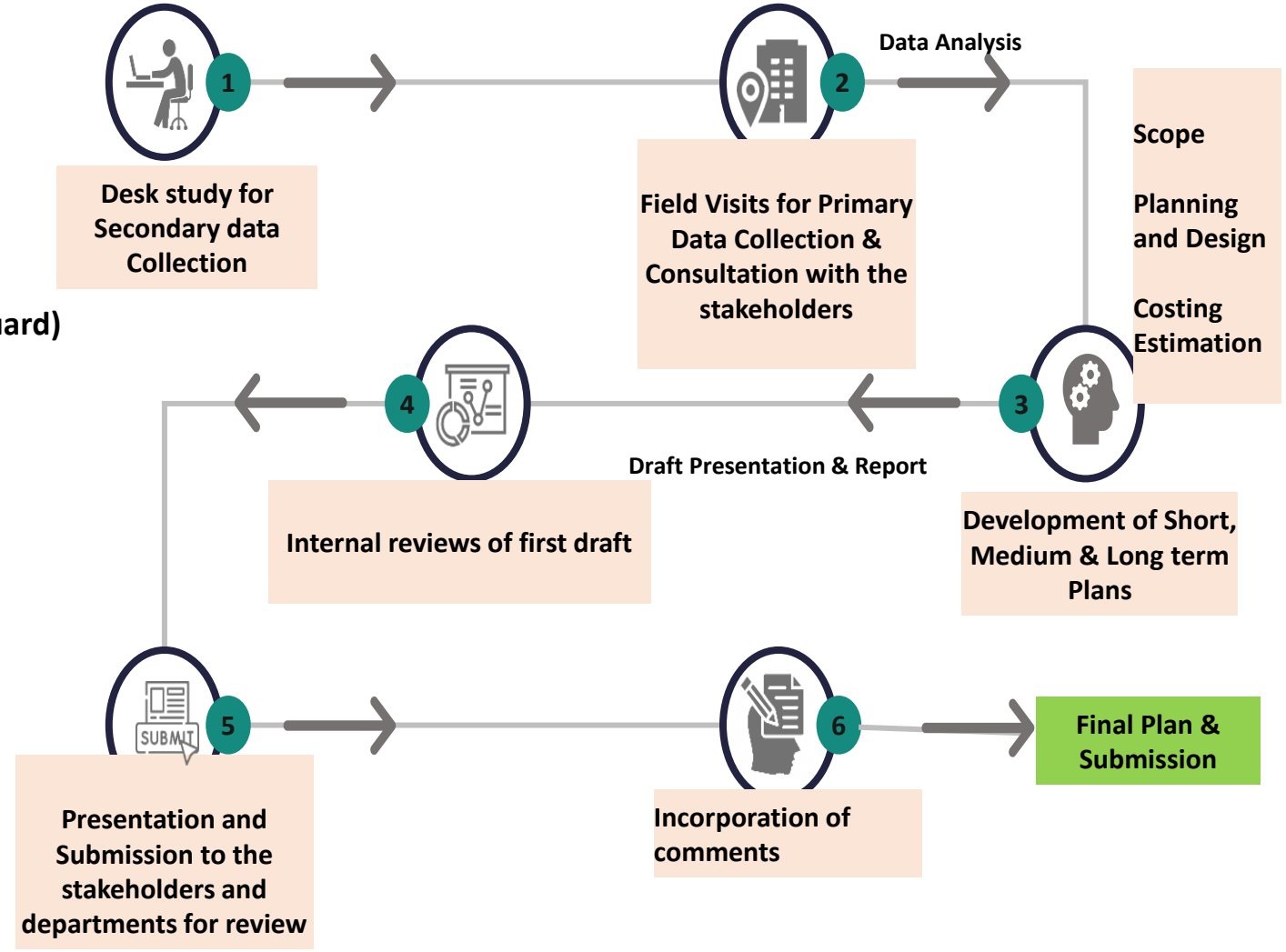
Field Working Days: 54

Office Working Days: 126

Project Team: 13

1. **Abid Hussainy (SS-Environment & Social Safeguard)**
2. Ammara Siddiqui (Manager-WSS)
3. Omer Ahmed (Manager-Civil)
4. Farhan Riaz (RA-Mechanical)
5. Ali Fahad (RA-Civil)
6. Zauraiz Haider (RA-Civil)
7. Talha Rashid (RA-Electrical)
8. Aneeqa Azeem (Manager GIS)
9. Rukhsar Shahzadi (RA-GIS)
10. Abdul Moize (RA-Architectural)
11. Imran Khan (Field Engineer-Civil)
12. Mehed Mobin (RA-Quantity Surveyor)
13. Hammad Ullah (RA-Assistant Architect)

METHODOLOGY



WASH Index

WASH Index Score card
Urban Punjab
2019 (UNICEF)

Water Indicators

- Improved Source Piped, Hand Pump/ Motorized
- Located in Premises
- Water Available 24 Hours
- Free from Contamination
- Safely Managed Water

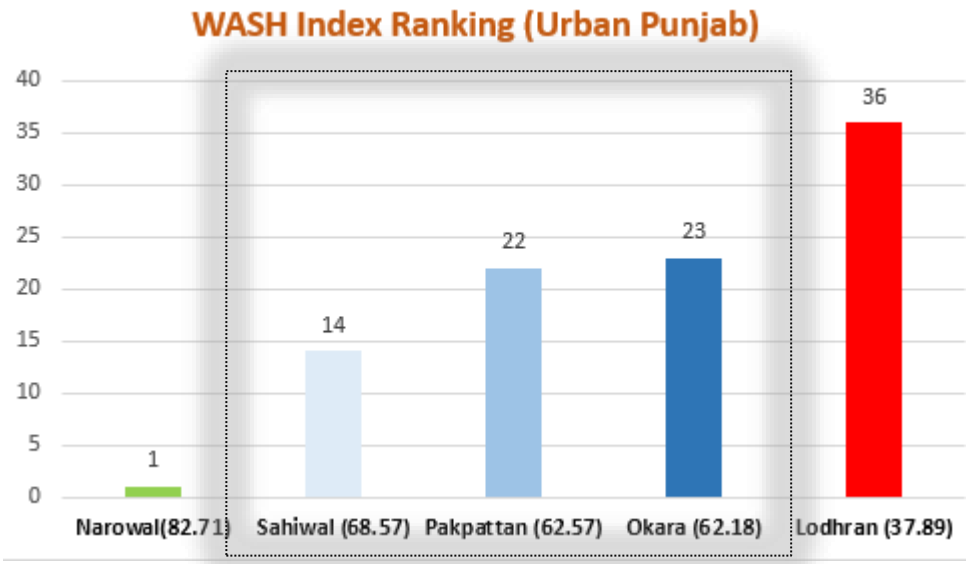
Sanitation Indicators

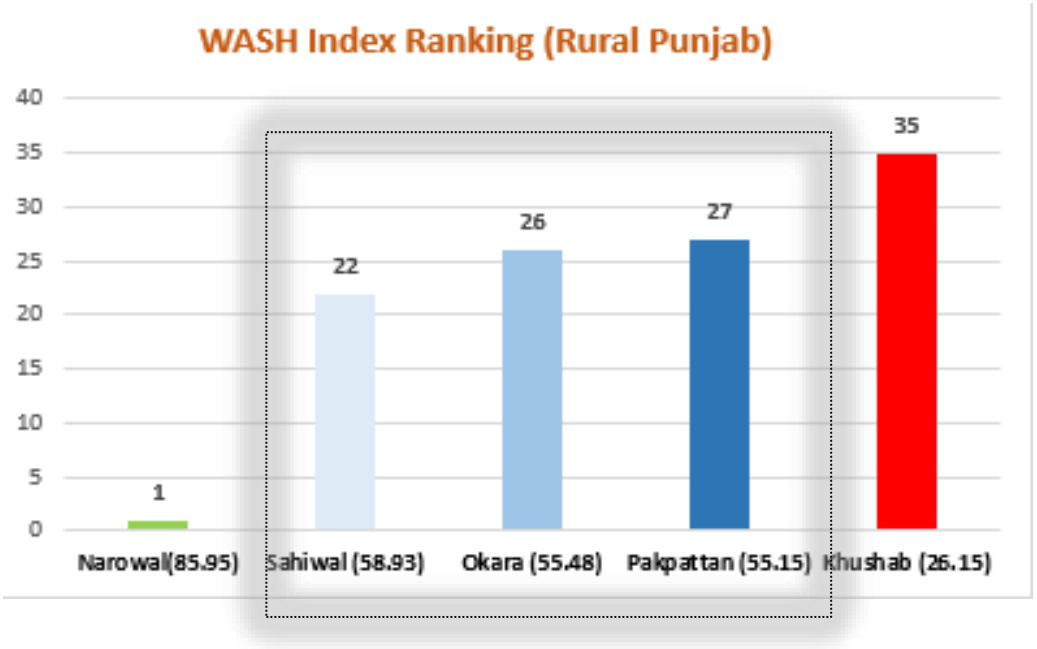
- Improved Sanitation
- Safe disposal in Situ (On site excreta treatment)
- Safely Managed Sanitation

Hygiene Indicators

- The dedicated place for Hand-Washing with water and soap

The overall sum of scores of Access to Water, Access to Sanitation and Hygiene is defined as WASH Index





The Urban Unit

SAHIWAL

REGIONAL DEVELOPMENT PLAN

WATER SUPPLY AND SANITATION (WSS)

Water Supply and Sanitation – Sahiwal (Urban)

- Sahiwal lies on the vast Indus River plain in the densely populated region between the Sutlej and Ravi rivers. It is the 21st largest city in Pakistan by population.
- Under the MC Boundary (2013), the current population of **488,665** (2023) in the city is estimated to reach the figure of **655,648** by the end of 2033 (Ref: Census 2017).
- The city has water supply coverage (spatially) of 75% - 80% whereas the sewerage infrastructure coverage (spatially) is around 85%.
- The government of Punjab is implementing the ADB-funded "Punjab Intermediate Cities Improvement Investment Program (PICIIP)" to improve the water supply and sanitation infrastructure of Sahiwal City. (Details →)
- As per the PCRWR publication "National Threat of Arsenic in Groundwater", Sahiwal falls in the list of highly contaminated areas with Arsenic in Punjab.

ADB PICIIP PROJECTS

S #	Project	QTY	Progress
Water Supply System			
1	Water Distribution Network	543 Km	(86% Completed)
2	House Connections	43,000 Nos.	(79% Completed)
3	New Tube Wells	28 Nos.	(89% Completed)
4	Overhead Reservoirs	4 Nos.	(95% Completed)
5	Filtration Plants	10 Nos.	(90% Completed)
6	Rehabilitation of Tube Wells	45 Nos.	(64% Completed)
Sewerage System			
1	Sewerage Network (South)	25.57 Km	(56% Completed)
2	Disposal Station (South)	1 Nos	(60% Completed)
3	Sewerage Network (North)	43 Km	(65% Completed)
4	RCC Conduits (7'x6.5')	7779 RFT	(49% Completed)
5	RCC Conduits (10'x7.75')	7925 RFT	(30% Completed)
6	Disposal Station (North)	1 Nos	(30% Completed)

Stakeholder Engagements – Sahiwal

MO Office (Infrastructure), MC Sahiwal

MO Office (Services), MC Sahiwal

District Officer, District Council Sahiwal

City Manager, PICIIP Sahiwal

Superintending Engineer, PHED Sahiwal

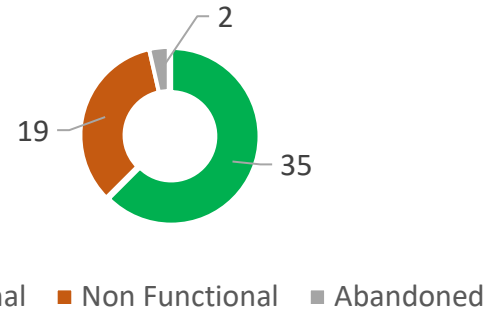
Research Officer, PCRWR Sahiwal

Water Supply System – Sahiwal (Urban)

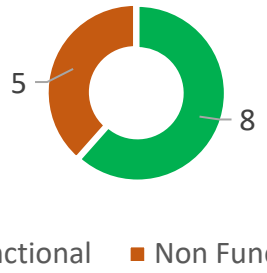
Contents	Value
Source of Water	Ground
Water Table (ft)	80 - 100
Existing Connections (Domestic)	5552
Existing Connections (Commercial)	88
Water Quality (Groundwater)	TDS >1000 (Up to 300') TDS <500 (Above 400')

- 66% of existing tube wells are more than 20 years old. (Under rehabilitation by PICIIP)
- 90% of the storage infrastructure (OHRs) is more than 40 years old.
- The water distribution network, previously in deteriorating condition, is being replaced under PICIIP.
- PCRWR Sahiwal found Arsenic levels at filtration plants (Sahiwal City) in the range of 30 – 51 (ppb) [WHO Limits: 10 ppb, PEQS Limit: 50 ppb]
- **Observations:** Water contamination issues, low supply hours in some areas, limited terminal pressures and areas without any infrastructure.

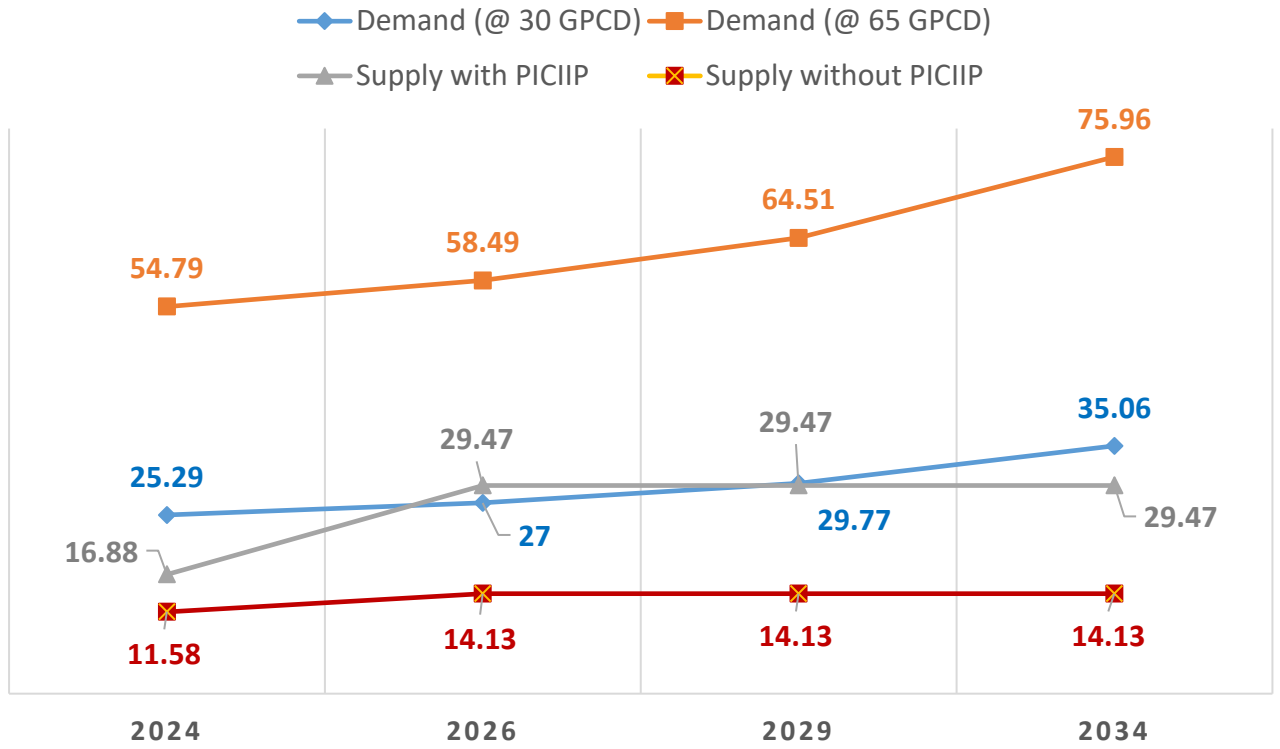
Existing Tube Wells (Nos)



Existing OHRs (Nos)



WATER DEMAND AND SUPPLY (MGD)



Water Supply System – Assessment & Observations

Water Supply Infrastructure

- Existing WS infrastructure including civil structures and machinery have expired their design life. (> 30 years)

Unserved Areas

- Water supply scheme (2012) in UC-01 is abandoned due handing / taking over issues between MC and PHE Dept.
- Presently, the areas of UC-02 and UC-03 have no water supply infrastructure

Rehabilitation under PICIIP

- Rehabilitation of 45 Nos tube wells (out of 53 Nos) is in progress and remaining will be retired.

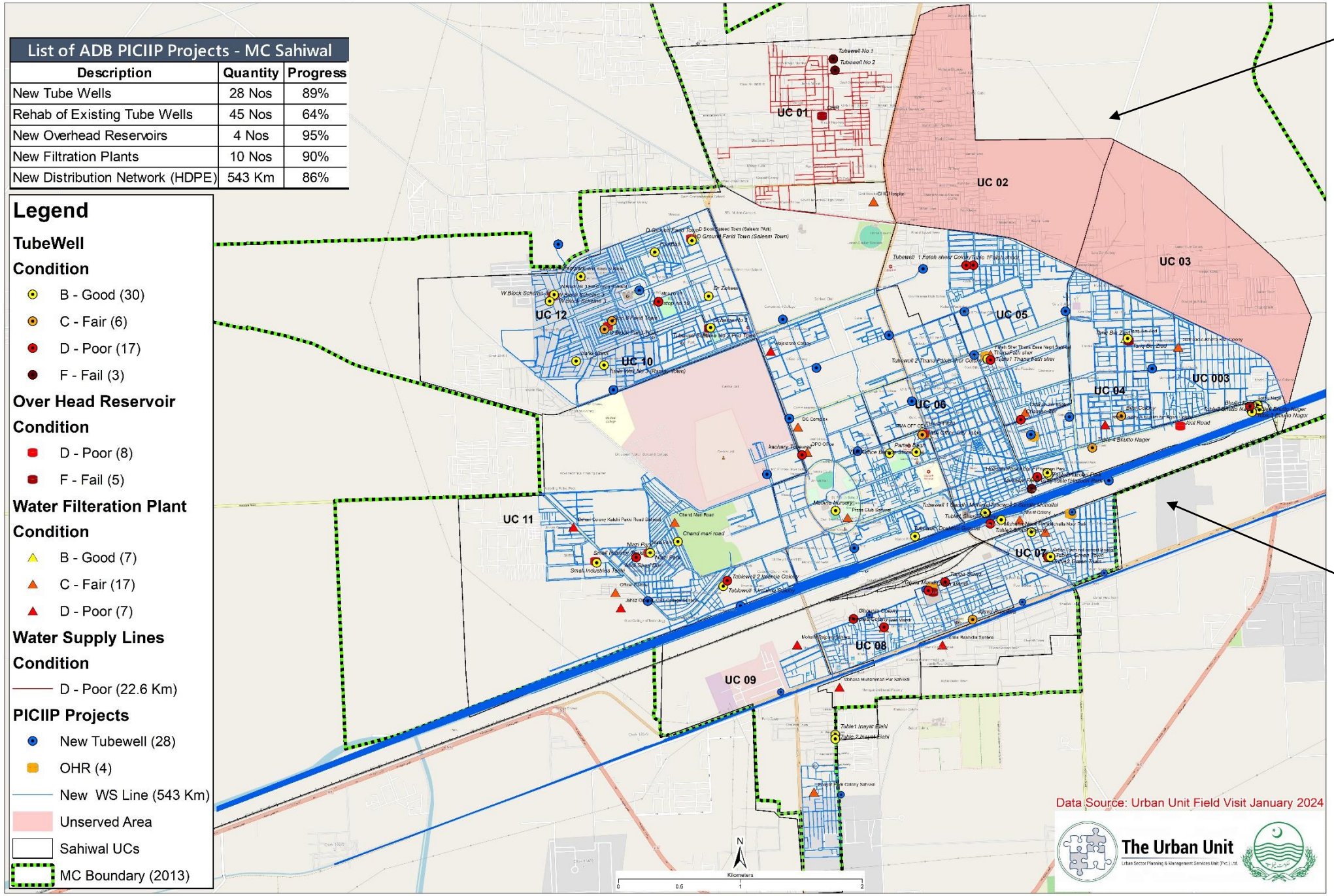
TW (Farid Town) Rehabilitated by PICIIP

Filtration Plant (Press Club) SWL

Tube Well Pumping Unit

Existing Water Supply Infrastructure Map of MC Sahiwal

List of ADB PICIIP Projects - MC Sahiwal		
Description	**Quantity**	**Progress**
New Tube Wells	28 Nos	89%
Rehab of Existing Tube Wells	45 Nos	64%
New Overhead Reservoirs	4 Nos	95%
New Filtration Plants	10 Nos	90%
New Distribution Network (HDPE)	543 Km	86%



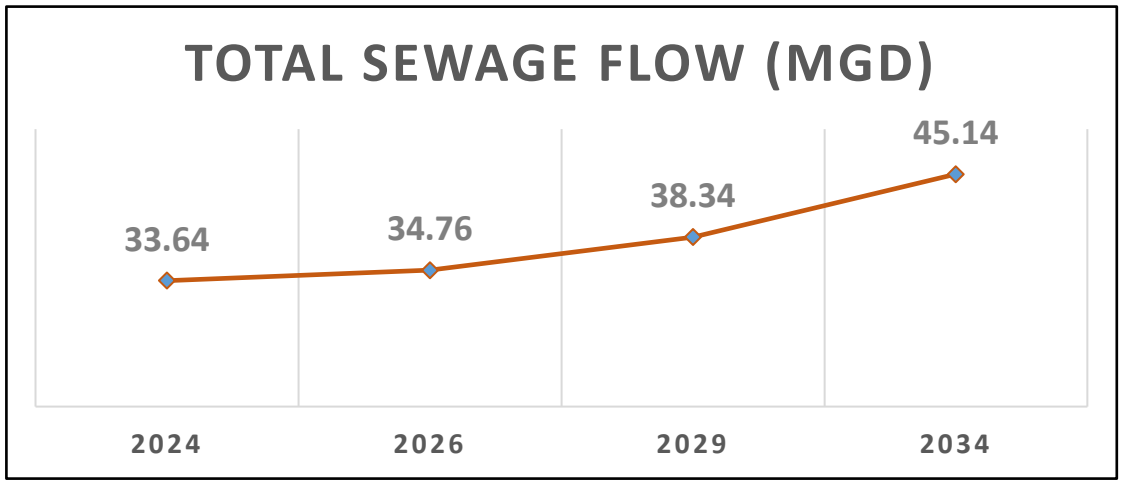
WS Scheme in UC-01 is abandoned due to handing / taking over issues between MC & PHE department.

No water supply infrastructure is present in UC-02 and UC-03. (Unserved)

Estimated Population is 79,659 in 2024.

New tube well, New OHRs and Water distribution (Blue lines) infrastructure laid under PICIIP.

Sewerage System – Sahiwal (Urban)



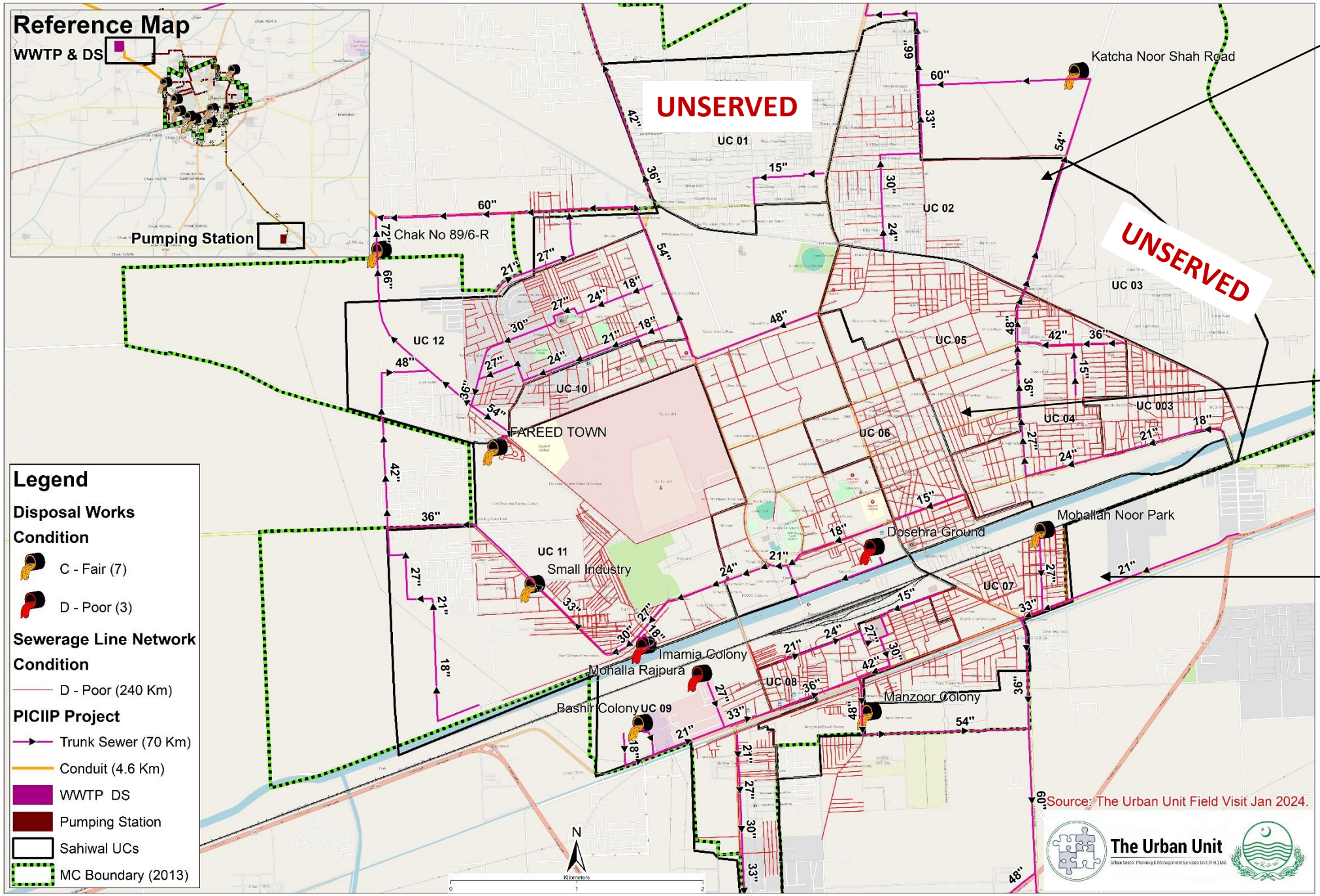
Disposal Station Farid Town SWL

Mobile Sewerage Machinery

- Laying of trunk sewerage infrastructure, conduit and construction of mega disposal stations are in progress under PICIIP. *(Existing disposal stations are planned to be eliminated)*
- The branch sewerage network of the city has expired its designed life (40-50 years old) causing wastewater flooding in the city center frequently.
- Existing mobile sewerage machinery is not sufficient enough to meet the requirement.
- The areas of UC-01, UC-02 and UC-03 are currently unserved and neither considered under PICIIP.

Under Construction Disposal Station (North) under PICIIP

Existing Sewerage Infrastructure Map of MC Sahiwal



The areas of UC-01, UC-02 and UC-03 have no sewerage infrastructure in place (Unserved)

Branch sewerage network of the city is in deteriorating condition needs immediate attention.

Under PICIIP project, the trunk (primary) sewer network is being laid along with mega DS WWTP

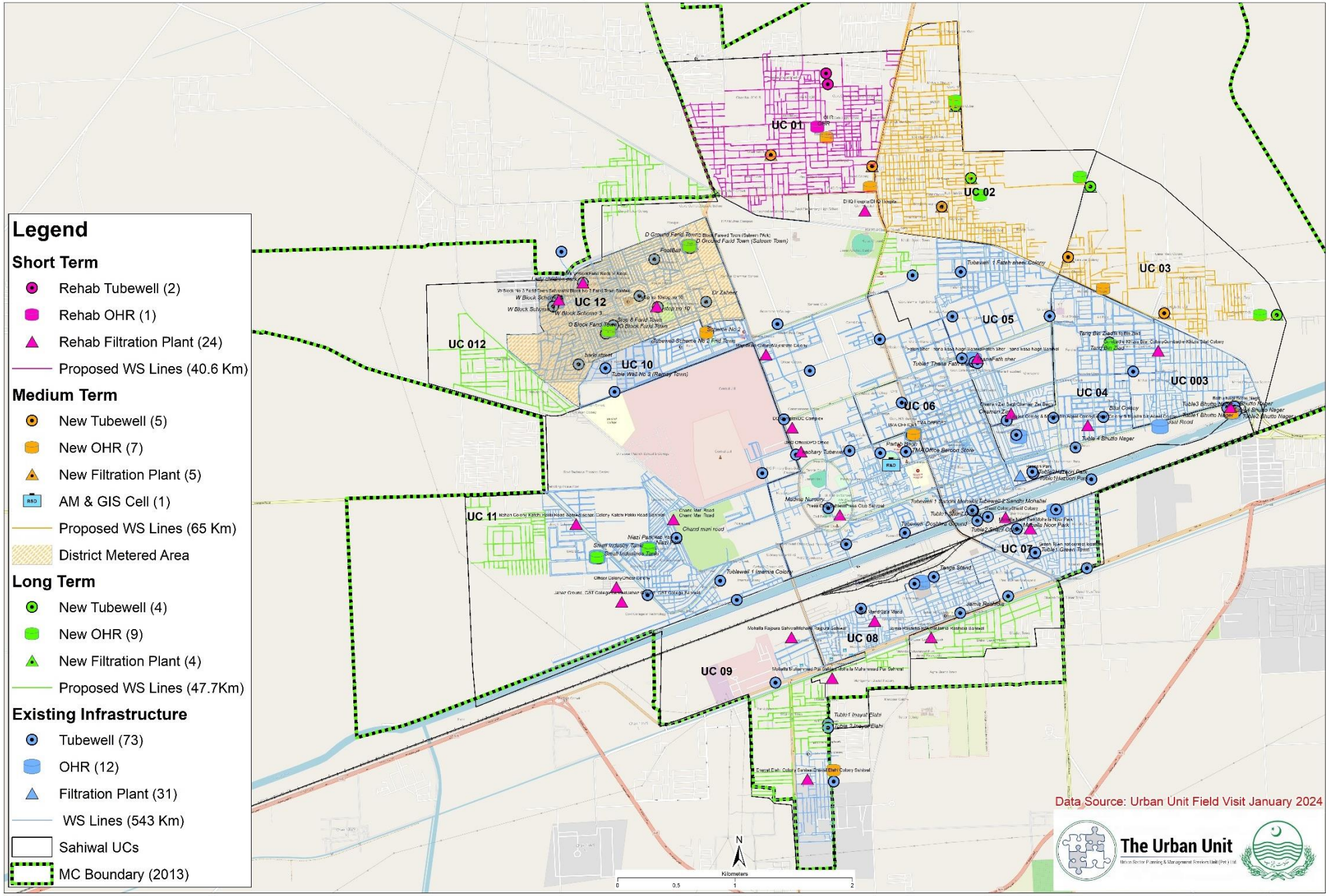
Sahiwal City – Water Supply Projects

Sr.	Project Phase	Proposed Schemes, Estimated Cost & Scope
1	Short Term (2026)	**Rehabilitation of Water Supply System in UC-01 Sahiwal City (@ 252.6 M)** **Scope of Project** ❑ Repairs of 2 Tube Wells (1.5 cusecs each) including civil works (pump house repairs as per requirement), electro-mechanical (machinery and panel as per requirement) & Repairs for 1 existing Overhead Tanks (50,000 gallons) in Sahiwal ❑ Replacement of outlived/damaged existing distribution network (22.6 Km) and extension of the network (18 Km) to unserved areas of UC-01. **Rehabilitation and solarization of drinking water infrastructure in Sahiwal City (@ 160 M)** **Scope of Project** ❑ Rehabilitation and repair program of filtration plants (24 Nos) in the city along with the addition of an Arsenic removal cartridge vessel and installation of dedicated rooftop solar system of 3kW on filtration plants (31 Nos)
2	Medium Term (2029)	**Extension of Water Supply System in Sahiwal City (@ 700 M)** **Scope of Project** ❑ Construction of 05 Nos Tube wells @1.5 cusecs along with filtration plants and 07 No Overhead Reservoirs (OHRs) (Total 600,000 gallons) ❑ Laying of the water distribution network (3”, 4”, 6”, 8”) of approximately 69 Km in the areas of UC-01, UC-02 and UC-03. **Establishment of District Metered Area (DMA) and GIS cell in Sahiwal City (@ 649 M)** ❑ Establishment of DMA as a pilot project in the area of Farid Town in Sahiwal City by installation of water meters at each connection, valves at nodes and junctions, and water monitoring components as required. ❑ Establishment of Asset Management and GIS cell in MC Sahiwal: Provision of computers, workstations, dedicated server system and related IT equipment & and resources.
3	Long Term (2034)	**Extension of Water Supply System in Sahiwal City (@ 642 M)** **Scope of Project** ❑ Construction of 04 Nos Tube wells @1.5 cusecs along with filtration plants and 09 No Overhead Reservoirs (OHRs) (Total 700,000 gallons) ❑ Extension of the water distribution network (3”, 4”, 6”, 8”) of approximately 48 Km in the areas of Industrial Area, Ganj Shakar, Shalimar Colony, Baba Farid Housing Society and adjoining localities.
		Water Supply Projects – Sahiwal City: 2,404 Million

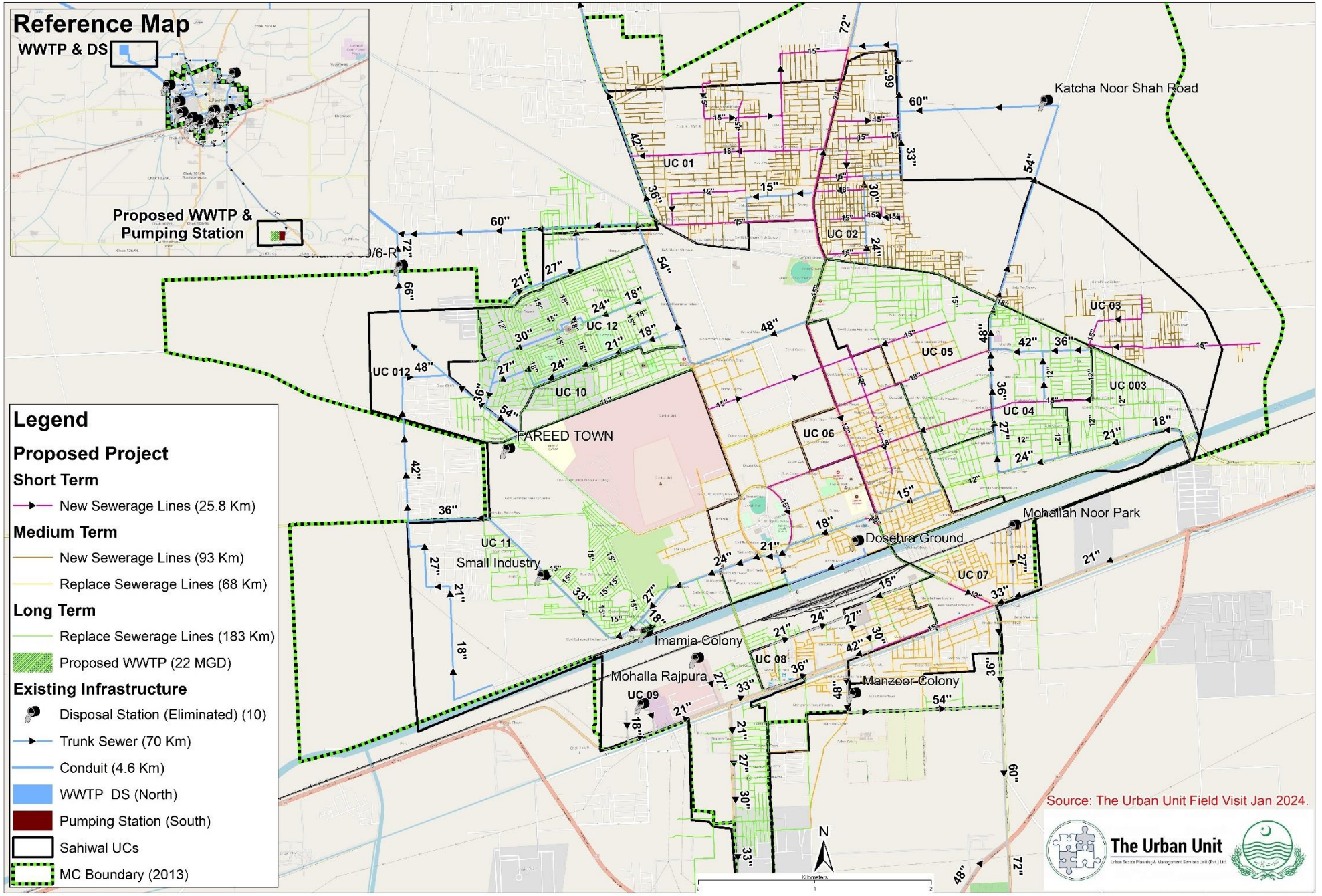
Sahiwal City – Sewerage Projects

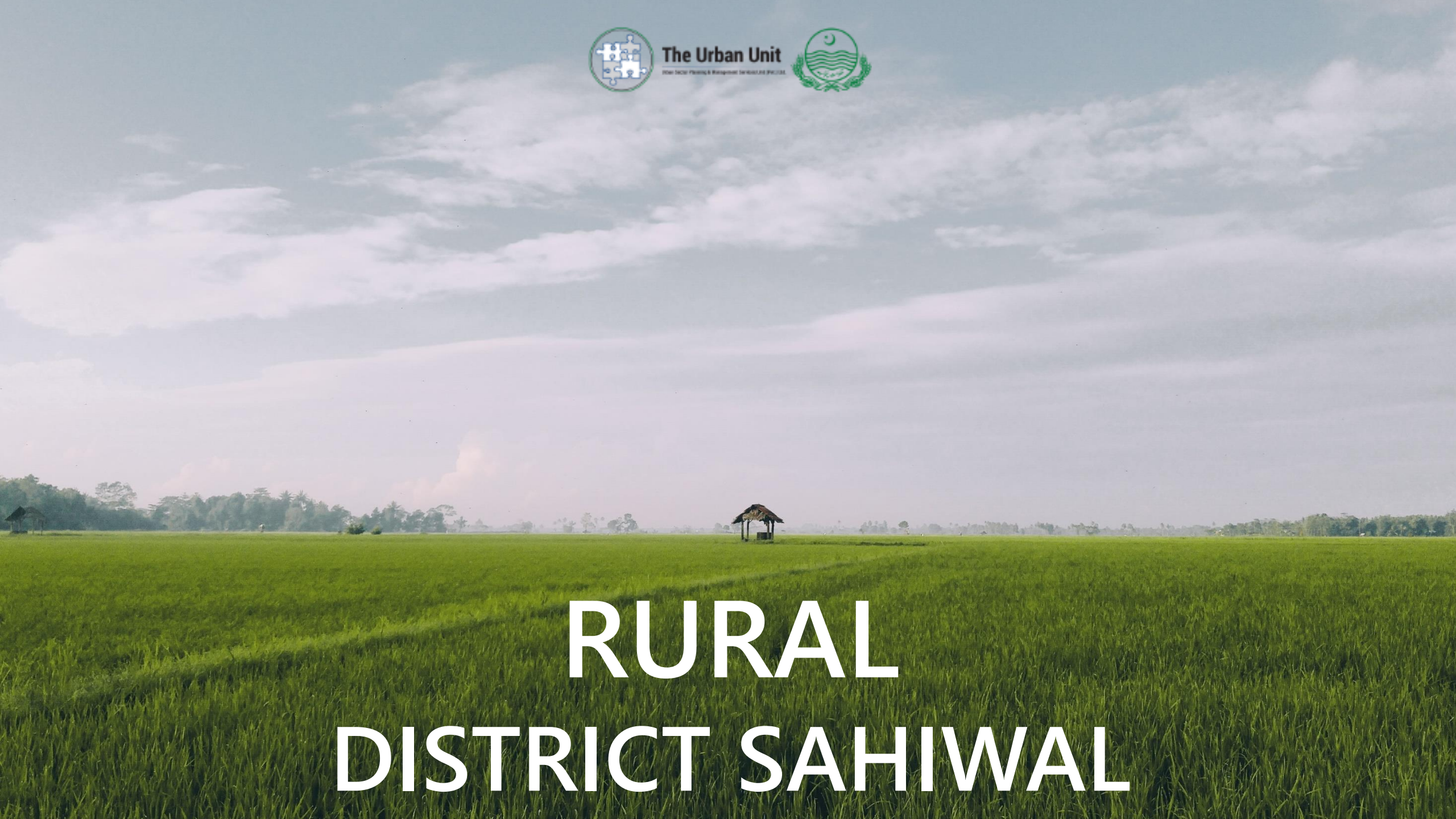
Sr.	Project Phase	Proposed Schemes, Estimated Cost & Scope
1	Short Term (2026)	**Rehabilitation & Extension of Sewerage Infrastructure in Sahiwal City – Phase I (206 M)** **Scope of Project** ❑ Laying of existing sewer lines of total length 25.8 KM having diameters (12” to 18”) in areas of UC-01, UC-02, UC-03, UC-05 and UC-06
2	Medium Term (2029)	**Rehabilitation & Extension of Sewerage Infrastructure in Sahiwal City – Phase II (1288 M)** **Scope of Project** ❑ Replacement of existing outdated branch sewer lines (9” to 12”) of total length 68 KM in areas of UC-05 and UC-06. ❑ Laying of new branch sewer infrastructure (9” to 12”) of total length 93 Km in the areas of UC-01, UC-02 and UC-03. **Provision of Mobile Sewerage Machinery in Sahiwal City – Phase II (138.2 M)** ❑ Procurement of 2 Nos sucker machine, 2 Nos jetting machine, 5 portable dewatering units, and 2 mobile workshop units
3	Long Term (2034)	**Rehabilitation & Extension of Sewerage Infrastructure in Sahiwal City – Phase III (2441 M)** **Scope of Project** ❑ Replacement of outdated branch sewers (9” to 12”) having a total length of 183 KM in areas of UC-04, UC-07, UC-08, UC-09, UC-10, UC-11, and UC-12. ❑ New WWTP (South) – Waste Stabilization type with auxiliary facilities and an estimated area of 150 Acres (site marked tentatively and subject to availability of land as per MC)
		Sewerage Projects – Sahiwal City: 4,073 Million

Interventions Map of Water Supply Infrastructure – Sahiwal City



Interventions Map of Sewerage Infrastructure – Sahiwal City





RURAL
DISTRICT SAHIWAL

Water Supply and Sanitation (WSS) – Sahiwal District

DISTRICT SAHIWAL

Tehsils: 2 | **Villages:** 524

Total Population (2017): *1,997,327*
Total Population (2024): *2,196,925*
Total Population (2034): *2,517,154*

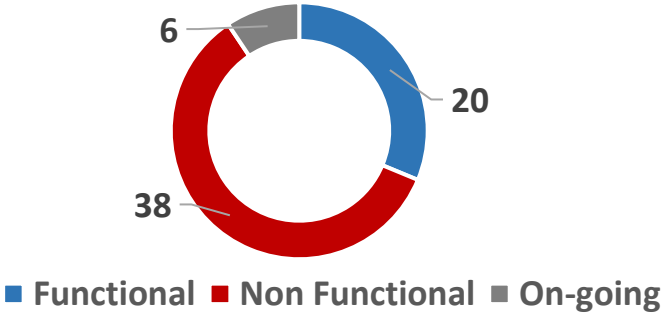
Estimated Beneficiary Population From WSS Service Delivery (2024): ***502,555 (23%)***

UNICEF WASH INDEX (2019)

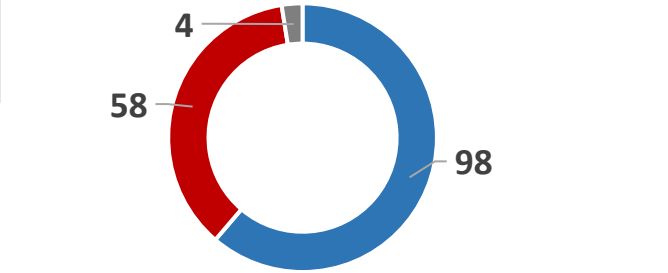
ACCESS TO WATER	ACCESS TO SANITATION
Rank: 17/36	Rank: 22/36

- ***Avg. Water Demand (2024):*** *32.95 MGD*
- ***Estimated Water Supply (2024):*** *3 MGD*
- ***Avg. Water Demand (2034):*** *37.76 MGD*

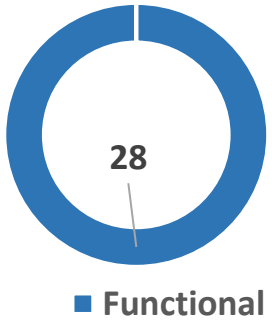
Rural Water Supply Schemes



Water Filtration Plants



Rural Sanitation Schemes



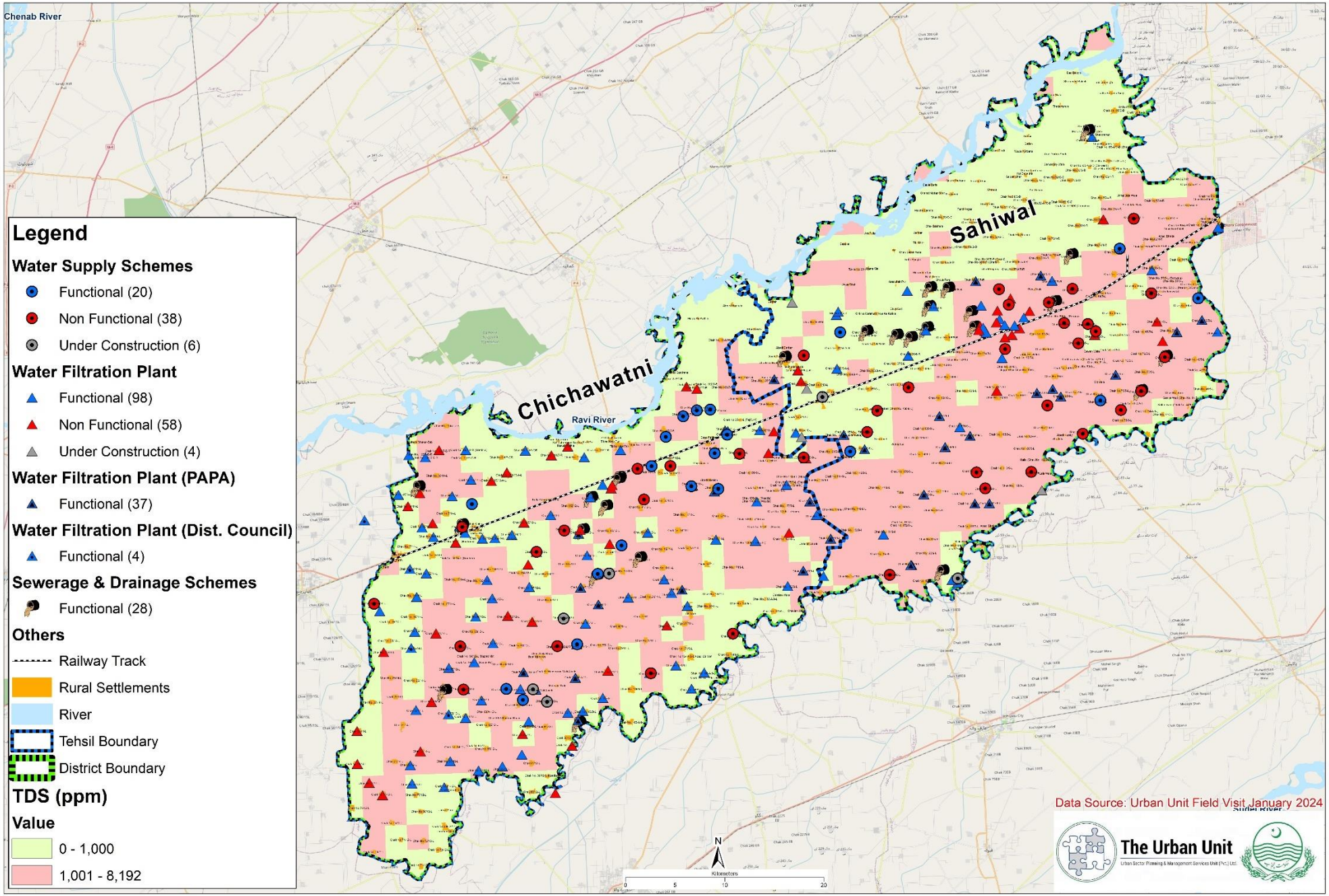
Abandoned RWSS – Harrappa SWL
The community is not willing to pay water charges due to water quality issues. High TDS found

Disposal Station – Harrappa SWL
Handing/Taking over issues B/W DC & PHED

Baseline Map of Rural Water Supply and Sanitation (WSS) – Sahiwal District

OBSERVATIONS

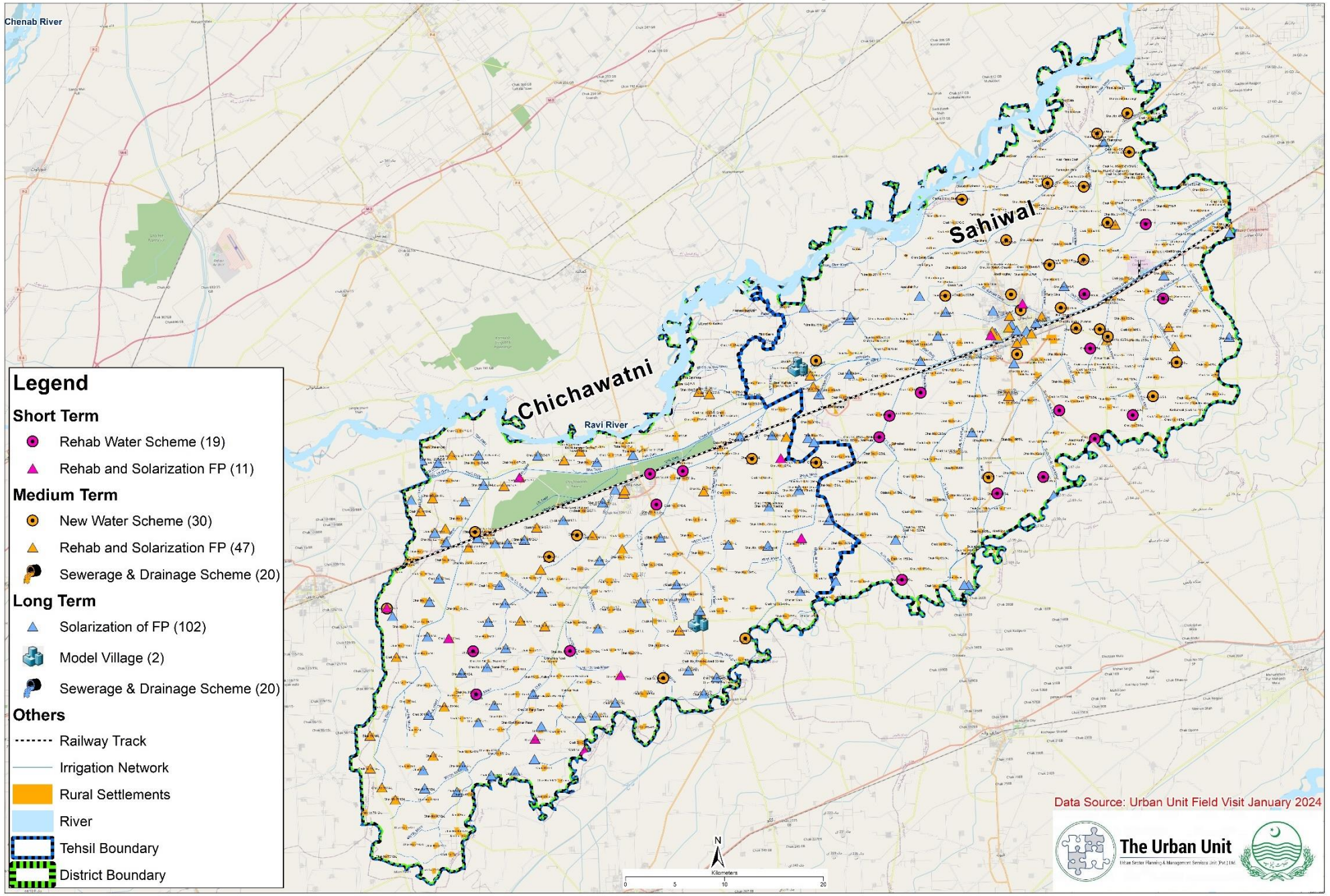
- Administrative issues in handing/taking over of a scheme between departments.
- Electricity Cost is the major hurdle in the smooth functioning of a scheme.
- Schemes handed over to CBOs lack proper maintenance due to the non-availability of expertise and funds.
- Ground water quality is a major concern (High TDS & Arsenic)
- Only 5% of the villages have wastewater disposal systems in place.



Water Supply and Sanitation (WSS) Interventions – Sahiwal District

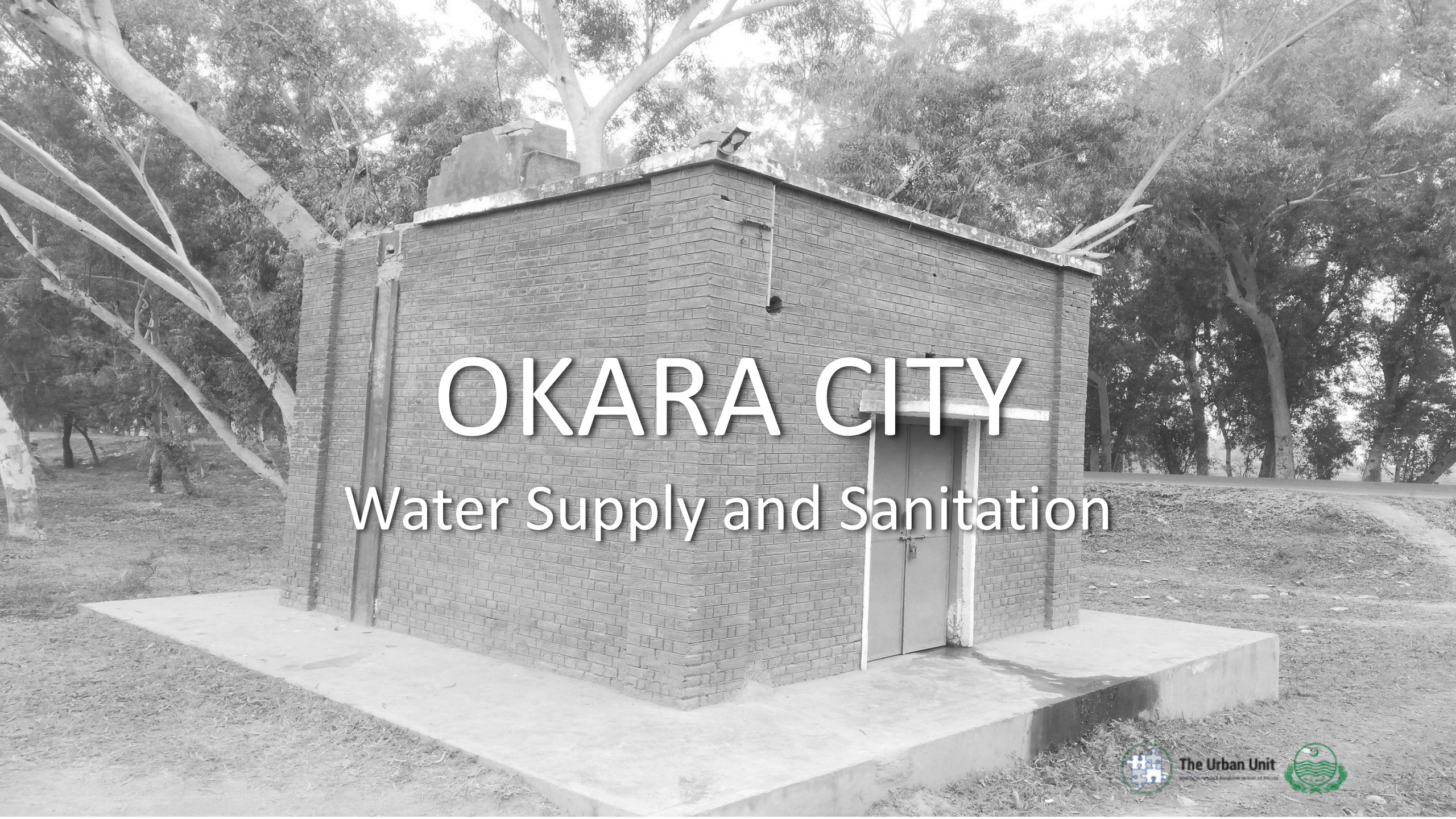
Sr.	Phase	Proposed Schemes, Estimated Cost & Scope
1	Short Term (2026)	**Sahiwal Rural Water Supply Uplift Program – Phase I (317.6 M)** **Scope of Project** ❑ Rehabilitation of 19 Nos Rural Water Supply Schemes in Sahiwal District (273.6 M) ❑ Rehabilitation and solarization (3 kW) of 11 Nos Rural Filtration Plants in Sahiwal District (44 M)
2	Medium Term (2029)	**Sahiwal Rural Water Supply Uplift Program – Phase II (954 M)** **Scope of Project** ❑ 30 Nos New Rural Water Supply Schemes with distribution infrastructure in Sahiwal District **Sahiwal Rural Sewerage and Drainage Scheme – Phase I (1096 M)** **Scope of Project** ❑ 20 Nos New Rural Sewerage and Drainage Schemes along with disposal mechanism in Sahiwal District for a population of more than 5000. (10 for each Tehsils)
3	Long Term (2034)	**Sahiwal Rural Water Supply Uplift Program - Phase III (58 M)** **Scope of Project** ❑ Rooftop Solar system for 102 Nos Rural Filtration Plants in Sahiwal District **Sahiwal Rural Sewerage and Drainage Scheme – Phase II (1096 M)** **Scope of Project** ❑ 20 Nos New Rural Sewerage and Drainage Schemes along with disposal mechanism in Sahiwal District for a population of more than 5000. (10 for each Tehsils) **Model Village Program in District Sahiwal – Pilot Project (46 M)** **Scope of Project** ❑ Provision of 100% coverage of water, sewerage and drainage services, wastewater treatment plant, and paved streets network in Harrappa (Tehsil Sahiwal) and Ghaziabad (Tehsil Chichawatni)
		Rural Water Supply and Sanitation Projects – Sahiwal District: 3,567 Million

Interventions Map of Rural Water Supply and Sanitation (WSS) – Sahiwal District



OKARA


P. N. THAPAR ESQUIRE, I. C. S.,
DEPUTY COMMISSIONER.
SARDAR UDHE SINGH, B. C. S.,
PRESIDENT, MUNICIPALITY.
&
RAJA GHULAM ALI,
VICE-PRESIDENT, MUNICIPALITY.


OKARA CITY
Water Supply and Sanitation
The Urban Unit

About WSS - Okara City (MC)

❑ LOCALITY

- The city of Okara is approximately 40 km from Sahiwal and located southwest of the city of Lahore and Faisalabad

❑ POPULATION

- 25th largest city of Pakistan by population with an estimated population of MC Okara **currently (2024)** being **442,274.**
- The population of the city is estimated to reach **597,850 in 2034 (Planning Year)**

Water Supply	Sewerage
▪ WS Coverage is around **60%** (spatially). ▪ A large share of population has **domestic bores** in their premises	▪ City is served with underground sewer lines (Spatially 85% of area served)

▪ A PHED Scheme for Water Supply Southern City Okara with following scope of work:
  ▪ 26 Tubewells (01 Cusecs each) along LBDC with
  ▪ Rising Mains and Distribution System
  ▪ Storage Structures (05 OHRs + 04 GSTs)
▪ The Scheme is almost complete but **non-operational** pertaining to issues related to hand over and non-funding
	▪ 128 Km poor & failed condition sewer lines
	▪ Choked & outlived sewer network due to under capacitated size and surpassing design life (>100 Km)
	▪ Crown Failure of Main Lines
	▪ Canal Pollution due to disposal of Zone 1 & 2 Wastewater without any treatment

▪ The Water Quality of Okara MC is **brackish and undrinkable (pH:6.6, TDS: 1098, EC 2205**)–Tested at 10 locations (House Bore) ▪ 25 Filtration Plants operational for provision of drinking water to the citizens	▪ PCP interventions- Comprehensive Sewerage Scheme for Okara City including WWTP (Majorly Zone 4)

Okara City – Stakeholder Consultations

Meeting with PMDFC on On-going Interventions in OKARA under PCP

Meeting with MC Okara on existing issues & Situation

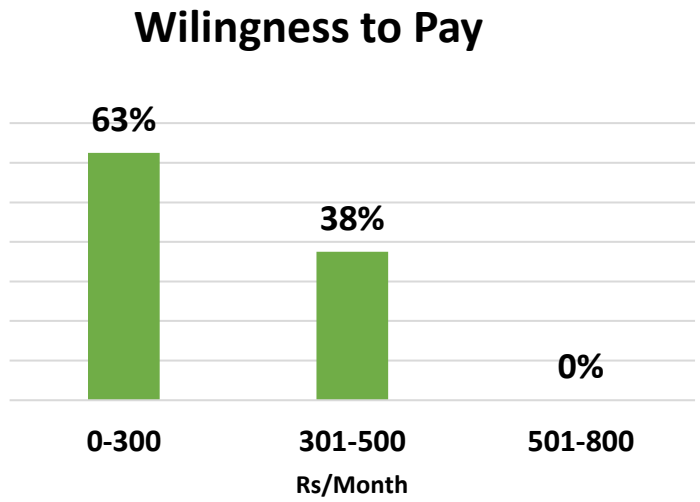
Meeting with PHED Okara

Comprehensive Sewerage Scheme is approved and being executed in OKARA City

- Laying of sewers and main Trunk under gravity for Zone 4 and associated areas
- Construction of Wastewater Treatment Plant (7.5 MGD) for Zone 4 up to 2050
- Procurement of Machinery for MC

Rehabilitation of 2/4L Disposal under process

Consultation with Community



Okara City - Water Supply Infrastructure

Tube Wells

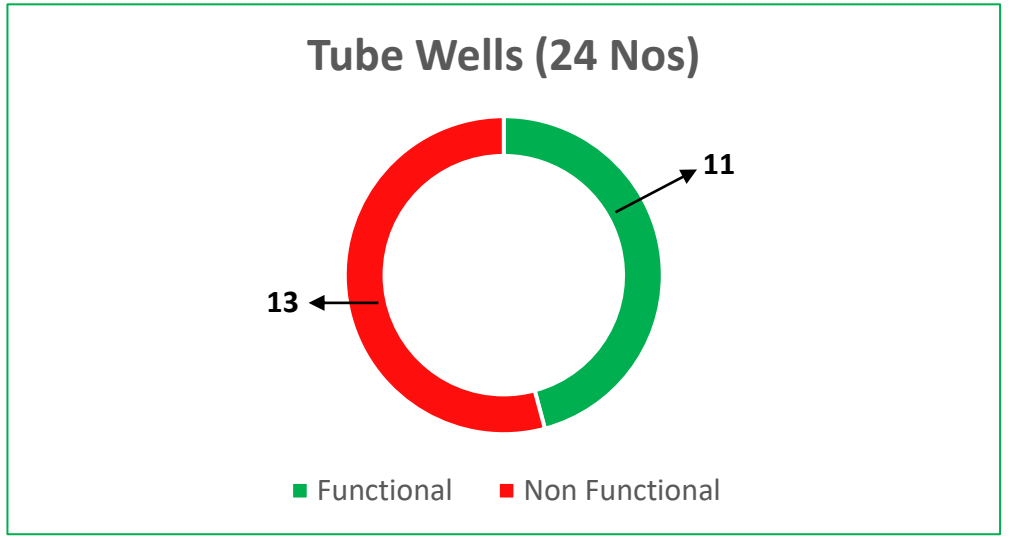
- Source of water in the city is seepage water extraction through **Tube Wells (24 Nos.)**
- Surface Water Sources
  - Lower Bari Doab Canal (LBDC)
  - 4-L Distributary

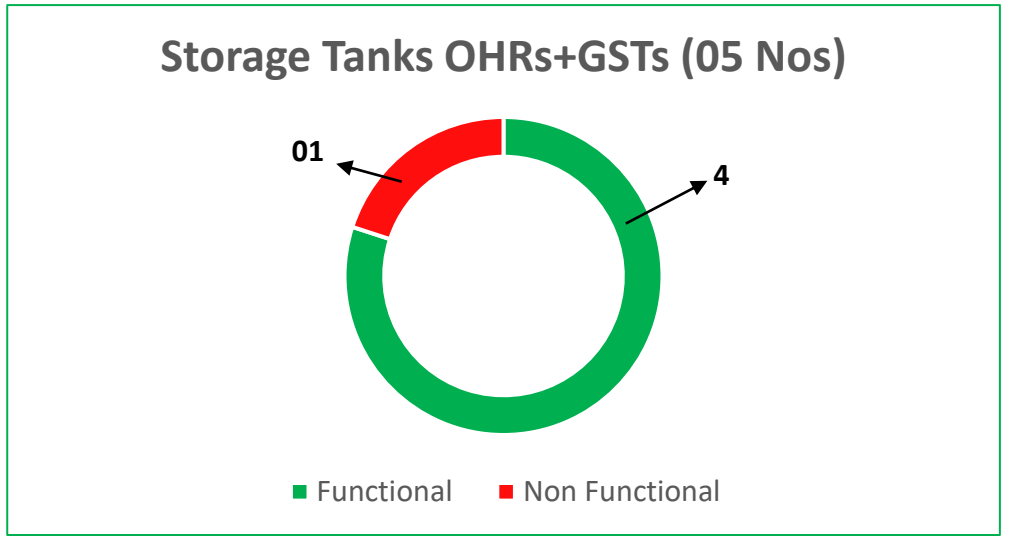
Over Head Reservoirs (OHRs)

- **01/01 Functional OHR** is filled by tube wells and water is further distributed to adjacent areas
- Most of the city has direct water supply from TWs

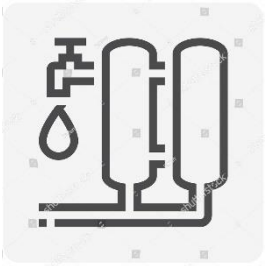
Ground Storage Tanks (GSTs)

- **GSTs (04 Nos.)** are filled by tube wells which either pump water to OHRs or directly supply it to adjacent areas
- **3/4 Functional GST**
- **1/4 Non-Functional GST**





Okara City - Water Supply Infrastructure

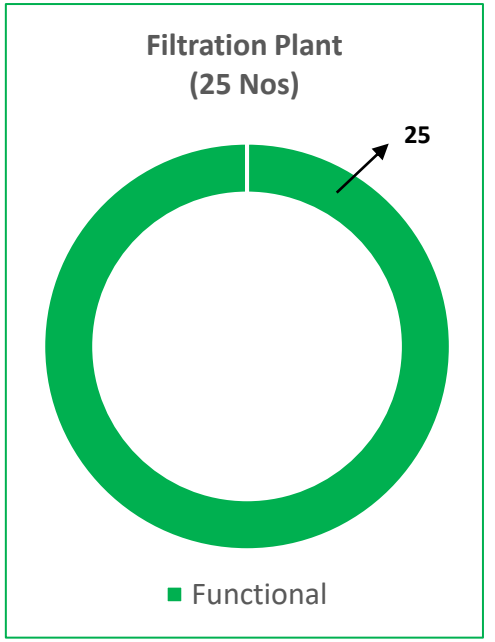


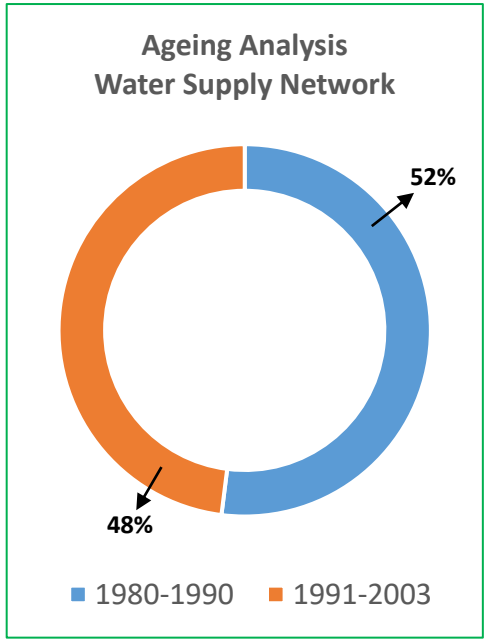
Filtration Plants

- Filtration Plants **(25 Nos)** operational for provision of drinking water to the citizens
- **Plant Type :** RO and UF

WS Pipelines

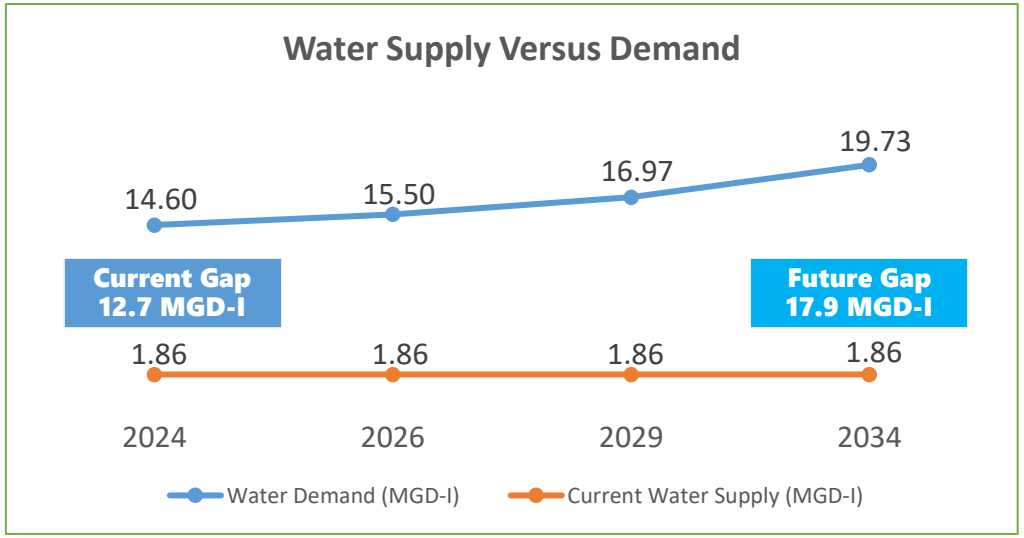
- **Water Supply Pipelines are mostly in Fair (C) Condition**





PHED Scheme

Infrastructure	Quantity	Scope	Current Status
Tube Wells	26 Nos	01 Cusec Each	Non - Functional
Rising Mains	53,969 Rft	8 inches to 24 inches	
Distribution Mains	381,863 Rft	3 inches to 16 inches	
Overhead Reservoirs	05 Nos	100,000 Gallons Each	
Ground Storage Tanks	04 Nos	3 Nos – 100,000 G 1 No – 150,000 G	

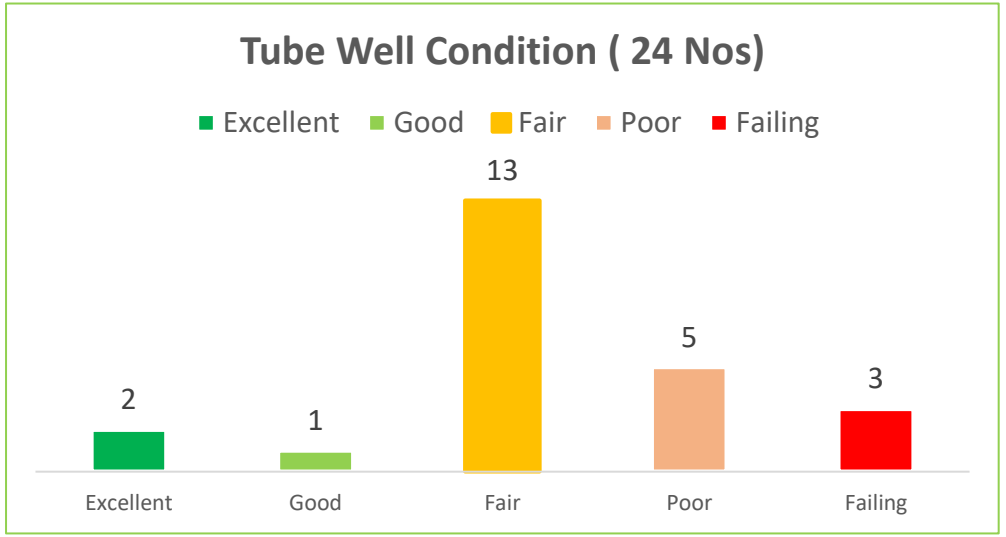


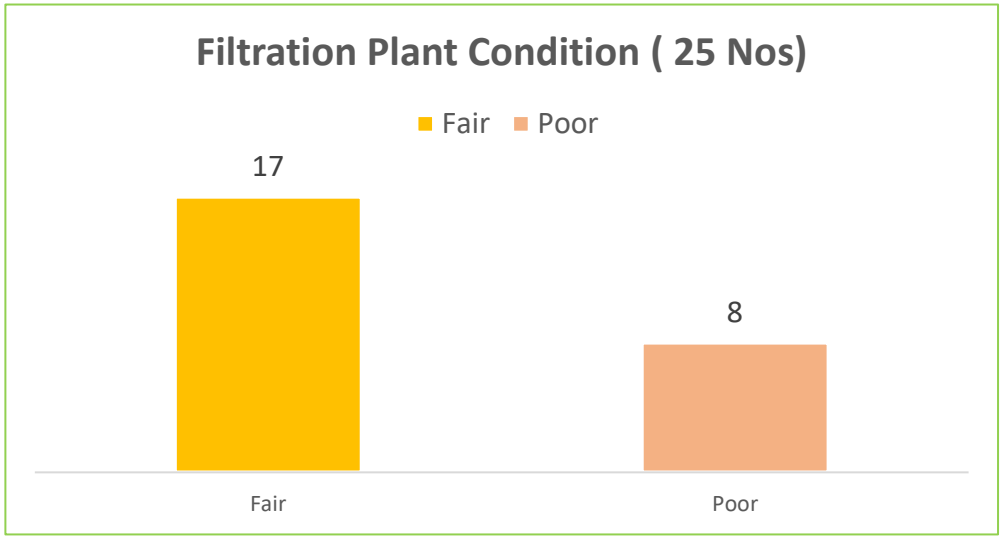
Okara City - Water Supply Infrastructure

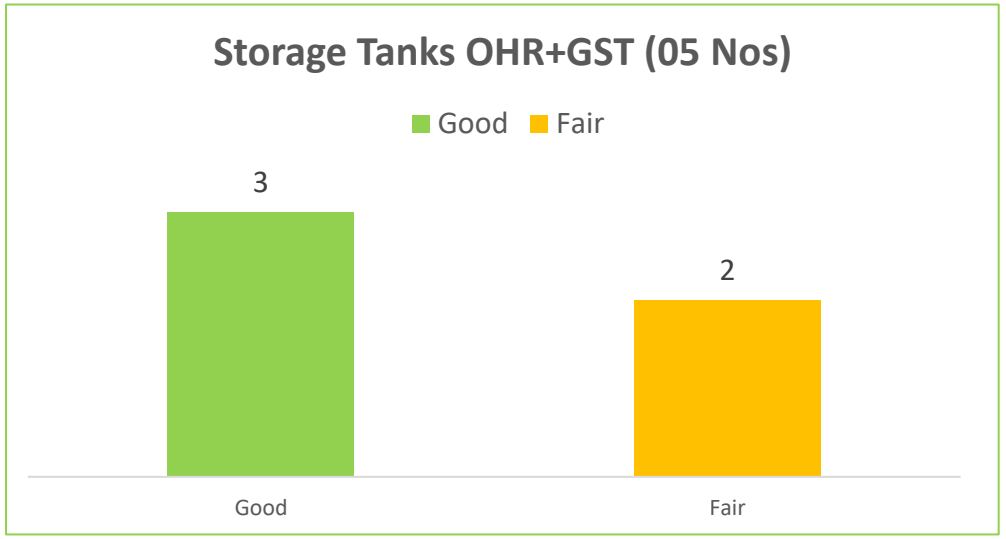
Major Issue Water Supply

- ❖ Marginal fresh water sources
- ❖ Acute water shortage in southern part of the city
- ❖ Low operational hours for tubewells

Rating	Asset Condition	Description
A	Excellent	No noticeable defects. Some aging or wear may be visible
B	Good	Only minor deterioration or defects are evident
C	Fair	Some deterioration or defects are evident, but function is not significantly affected
D	Poor	Serious deterioration in at least some portion of the structure. Function is inadequate
F	Failing	No longer functional. General failure or complete failure of a major structural component







Okara City - Water Supply Infrastructure Condition Assessment

- Deteriorating and Outlived Delivery Main of TWs
- Theft Issues related to Electrical Equipment's reported in some of the Tube Wells
- Failing PHED Water Supply Infrastructure due to handing over and funding issues
- Reduced Discharge of Some TWs due to Over Pumping
- Absence of Hypo-Chlorinator and Bulk Meter
- Outlived Pumping Machinery of GSTs

Asset Attribute	Rating
Civil Structures	C (Fair)
Distribution Network	C (Fair)
Electro-Mechanical	C (Fair)

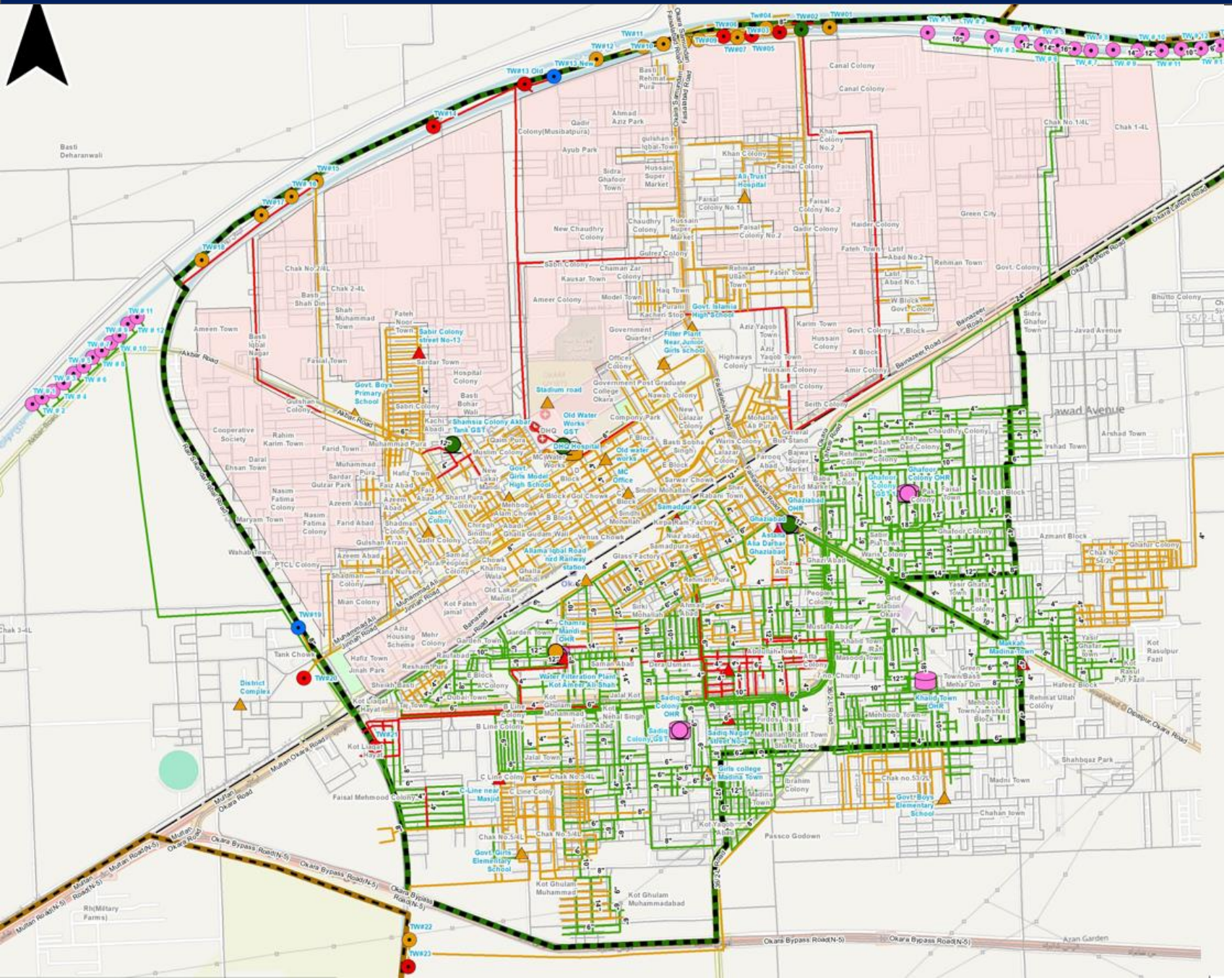
Pump House Tube Well # 5
Constructed in 2003

Allama Iqbal Road RO Filtration Unit
Installation in 2020

OHR at Old Water Works
Constructed in 1935

Chamra Mandi GST
Constructed in 1987

Okara City - Water Supply Infrastructure Baseline



Legend

FP Condition
- C (Fair) (17)
- D (Good) (8)
- D (Poor) (5)
- F (Failing) (3)
- PHED TW (26)

GST Condition
- B (Good) (3)
- C (Fair) (1)
- PHED GST (4)

OHR Condition
- C (Fair) (1)
- PHED OHR (5)

Tubewell Condition
- A (Excellent) (2)
- B (Good) (1)
- C (Fair) (13)

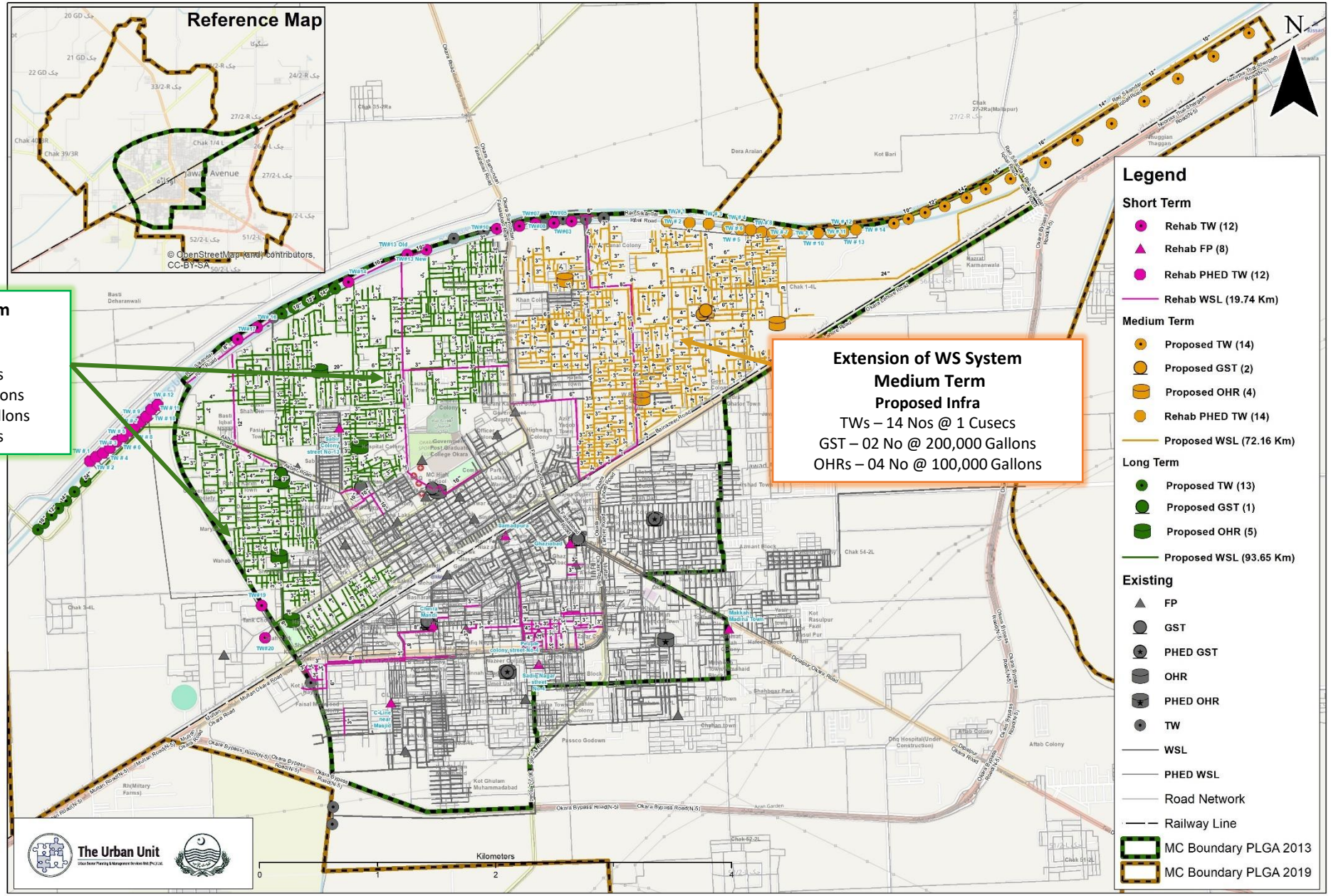
WSL Condition
- Fair (110.42 Km)
- Poor (18.07 Km)
- PHED WSL
- Railway Line
- Road Network
- Unserved Area
- MC Boundary PLGA 2013
- MC Boundary PLGA 2019

Okara City – Water Supply Projects

Sr.	Project Phase	Proposed Schemes, Estimated Cost & Scope
1	Short Term (2026)	**Rehabilitation of Existing Water Supply System in Okara City Phase-I (@268 M)** **Scope of Project** ❑ Rehabilitation of existing tubewells in Okara City ❖ Rehabilitation of 05 Non Functional Tube Wells (TW#07, 08, 10, 13 New & 17) through the provision of transformers and electrical cables ❖ New Borehole drilling, along with rehabilitation of civil structure and electrical panels (as required) in TW# 3, TW#13 Old & TW# 20 ❖ Minor Repairs to the civil structure and transformer repair of TW # 05 and TW # 16 ❖ Rehabilitation of Tube Well # 14 and Tube Well # 19 by replacing delivery main with the diameter of 8 inches ❑ Rehabilitation of 08 Nos Filtration Plants (People colony street No-4, Makkah Madina Town, Ghaziabad, Chmra Mandi, Samadpura, Sadiq Nagar street No-4, C-Line near Masjid & Sabir Colony street No-13) through Media Change and Filter Replacement as required ❑ Rehabilitation of 18 Km poor condition of WS Rising and Distribution Mains Main having Diameter of 12”, 10”, 8”, 6”, and 4” ❑ Rehabilitation of Line L1 PHED Tubewells 12 Nos through Minor Repairs to the Civil Structure and Electromechanical Equipment, if required
2	Medium Term (2029)	**Extension of Water Supply System in Northern City Okara – Phase I (@1,180 M)** ❑ Construction of 14 Tube Wells (1 Cusec each) including well bores, pump houses, machinery and allied components ❑ Construction of 02 GSTs having a capacity of 200,000 Gallons each and 04 OHRs having capacities of 100,000 Gallons each with laying of rising main and distribution network of total length of 72 KM having varying diameters (3”, 4”, 6”, 8”, 10”, 12”, 14”, 16” & 24”) in unserved areas of Green City, Rehman Town, Chak 1/4 L and Canal Colony **Rehabilitation of Existing Water Supply System in Okara City Phase-II (@5 M)** **Scope of Project** ❑ Rehabilitation of Line L2 PHED Tubewells 14 Nos through Minor Repairs to the Civil Structure and Electromechanical Equipment, if required
3	Long Term (2034)	**Extension of Water Supply System in Northern City Okara – Phase II (@1,048 M)** **Scope of Project** ❑ Construction of 13 Tube Wells (1 Cusec each) including well bores, pump houses, machinery and allied components ❑ Construction of 01 GST having a capacity of 200,000 Gallons, 01 OHR having 150,000 Gallons Capacity, 01 OHR having 100,000 Gallons and 03 OHRs having capacities of 50,000 Gallons each with laying of rising main and distribution network of total length of 94 KM having varying diameters (8”, 10”, 12”, 14”, 20” & 24”) in unserved areas of Chak 2/4 L, Shah Muhammad Town, Hospital Colony, Basti Bohar Wali, Cooperative Society, Rahim Karim Town, Darul Ehsan Town, Faridabad, Muhammad Pura, Hafiz Town and Kot Fateh Jamal
		Water Supply Projects – Okara City: Rs. 2,424 Million

Okara City – Water Supply Interventions

Water Supply Intervention - MC Okara

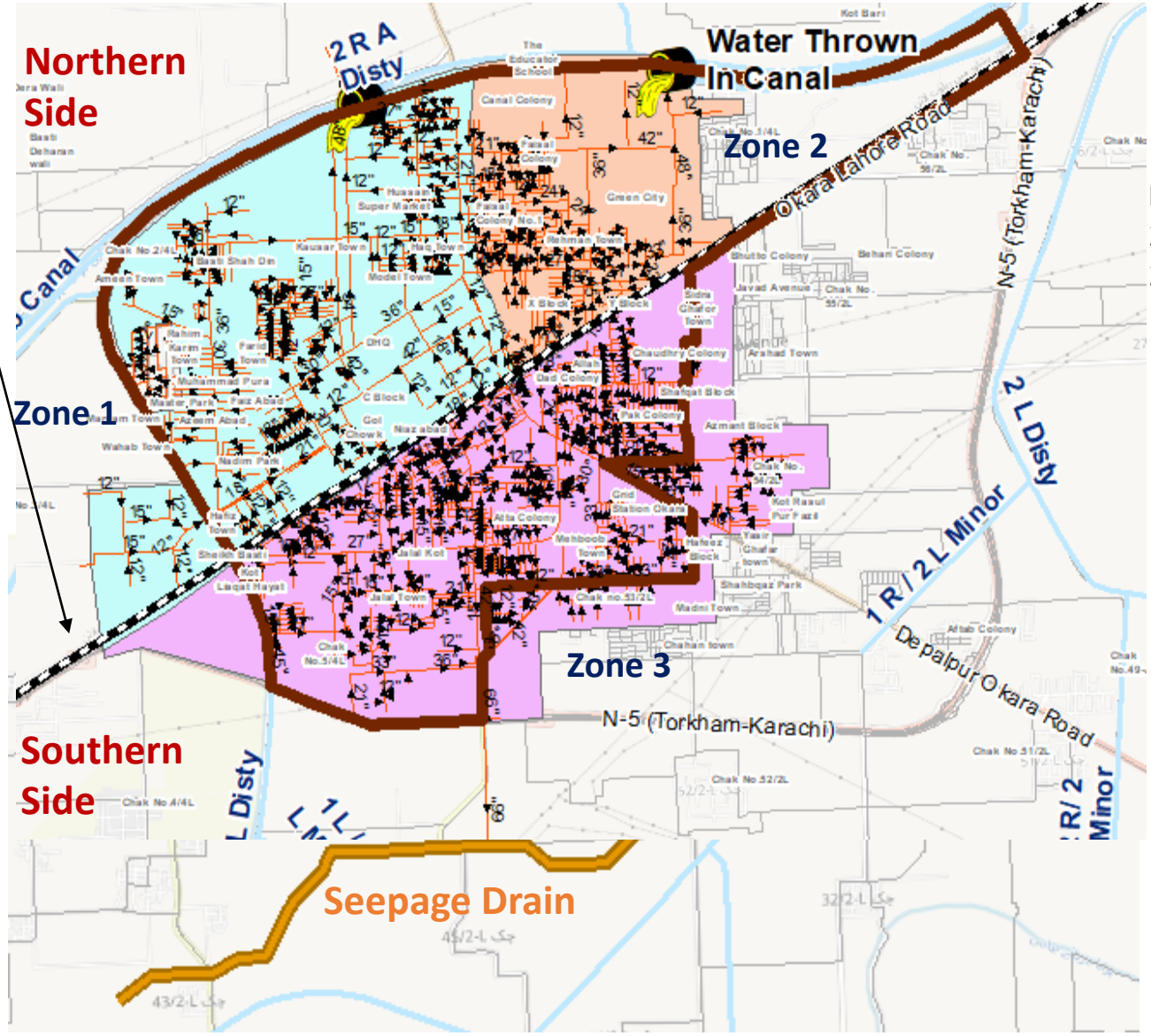


Extension of WS System
Long Term
Proposed Infra
TWs – 13 Nos @ 1 Cusecs
GST – 01 No @ 200,000 Gallons
OHRs – 01 No @ 100,000 Gallons
03 Nos @ 50,000 Gallons

Extension of WS System
Medium Term
Proposed Infra
TWs – 14 Nos @ 1 Cusecs
GST – 02 No @ 200,000 Gallons
OHRs – 04 No @ 100,000 Gallons

Okara City – Existing Sewerage System

- City is divided in to two parts through Railway Track
- Currently, Wastewater from Zone 1 & 2 (Northern side) is disposed off in to agriculture field after pumping through 2 Disposal Stations **<u>Wastewater from Southern side is disposed off through gravity in to Seepage Drain</u>**
- Sewerage line of Approx. **253 km having 9''-66'' dia**
- 43% of Sewerage Network have expired their design life (>25 Years)



MC 2013 Boundary is being followed

Existing Machinery:
2 Sucker Machines
2 Jetting Machines
1 Winch Machine

- Approx. 23 MGD sewage is being produced by citizens as of 2024 and disposed off **<u>without any treatment</u>**
- Underground sewer pipeline spatial coverage is approx. 85%

Okara City – Status of Existing Sewerage Infrastructure

Sewerage Network

- Approx. 7 Km of sewer lines have Cleanliness & Choking Issues
- 6.4 Km Crown Failure Exist
- 3.7 Km of lines are dead due to their expired design life, & being undersized

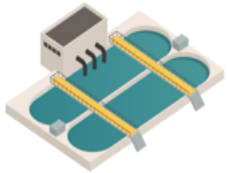
Sewer Crown Failure

House Damage due to Sewer Crown Failure

Disposal Stations

- FUNCTIONAL- 2/4 L Disposal Station (Zone 1) have pumping capacity of Approx. 42 Cusecs have bad condition of Civil Structure. 1 Pump of 5 Cusecs is NF (Rehab going-on by PMDFC)
- FUNCTIONAL- 1/4 L Disposal Station (Zone 2) have pumping capacity of Approx. 25 Cusecs. Recently installed in 2012

Wastewater Dispose–off



- Wastewater generated through Zone 1 & 2 (63%) is disposed off in to agriculture land after crossing the Lower Bari Doab Canal (City major wastewater is badly polluting the fresh water through leakages & Directly disposal in canal)
- Southern City Wastewater is disposed off in Seepage Drain

Sewage Disposal in to Canal

Sewage Disposal in Seepage Drain

Okara City – Condition Assessment of Sewerage Infrastructure

Asset Condition	1 /4 L DS	2/4 L DS	Sewerage Network
Civil Structure	B	D	7.6 Km Lines are in F Condition 119 Km lines are in D Condition
Electro-Mechanical	C	C	
Overall Asset Condition	C	D	

Rating	Asset Condition	Description
A	Excellent	No noticeable defects. Some aging or wear may be visible
B	Good	Only minor deterioration or defects are evident
C	Fair	Some deterioration or defects are evident, but function is not significantly affected
D	Poor	Serious deterioration in at least some portion of the structure. Function is inadequate
F	Failing	No longer functional. General failure or complete failure of a major structural component

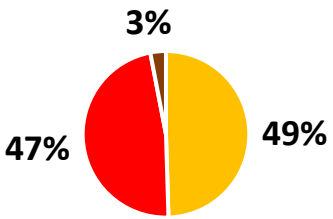
Ponding issues and poor sewage lines in Wazir colony & Aladaad Colony

Disposal Station 1/4 L

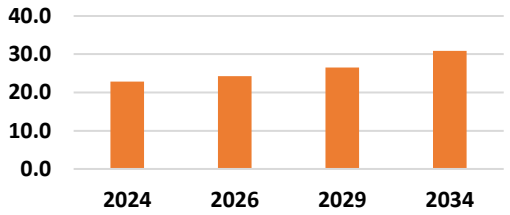
Disposal Station 2/4 L

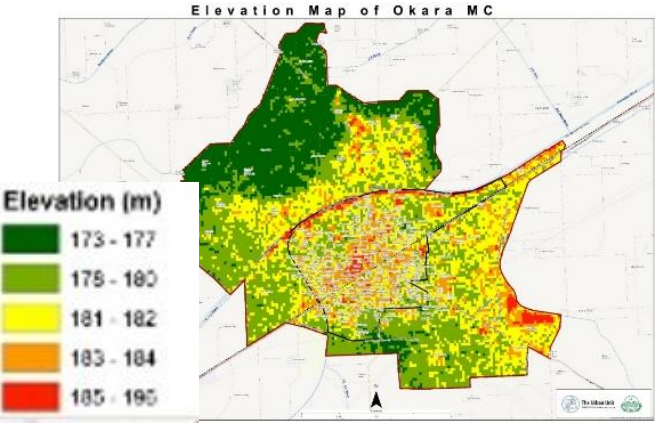
Okara City – Baseline Map for Sewerage System

Sewerage Network Condition



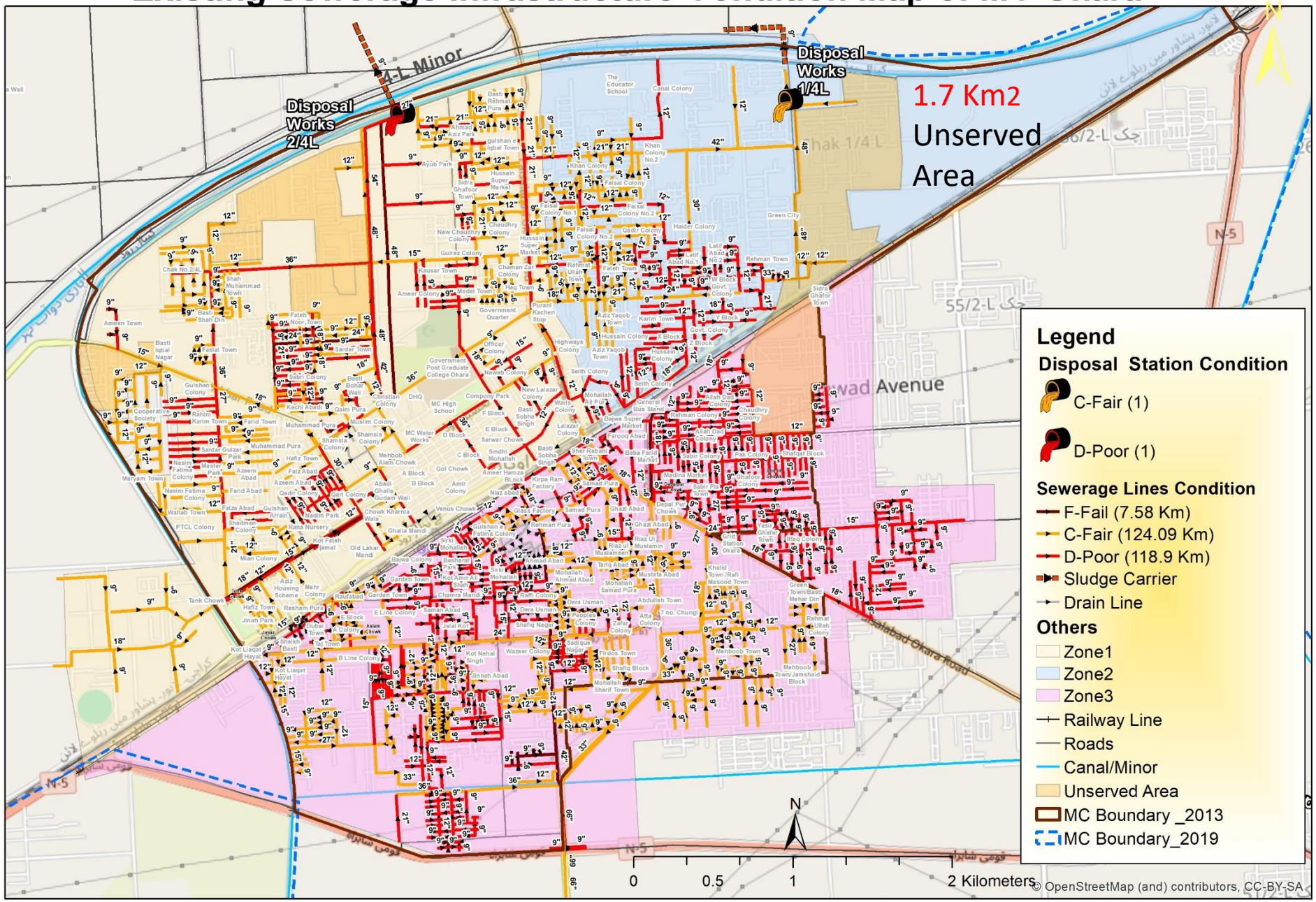
Sewage Generation





Downstream Elevation of Northern & Southern area is towards North & South Respectively

Existing Sewerage Infrastructure Condition Map of MC Okara



Okara City – Sewerage Projects

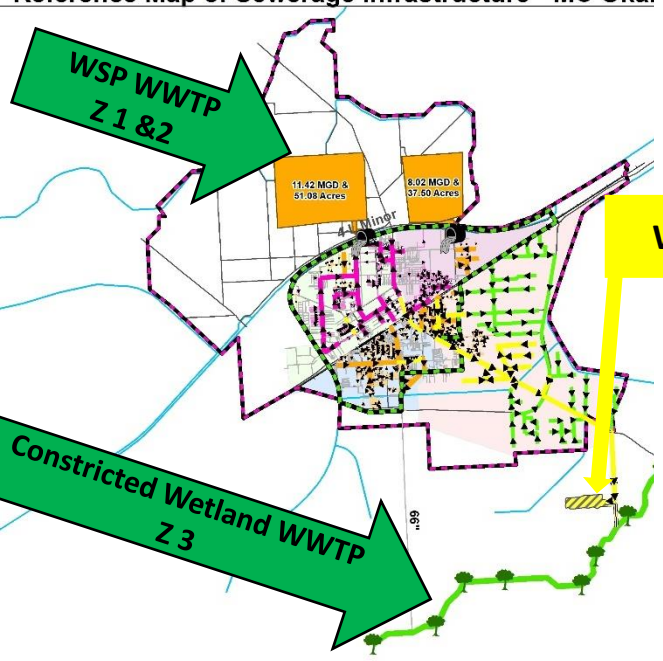
Sr.	Project Phase	Proposed Schemes, Estimated Cost & Scope
1	Short Term (2026)	**Replacement & Upgradation of Poor Condition Sewerage Lines of Approx. 50 Km in Zone 1 &2 of MC Okara (@1603 M)** **Scope of Project** ❑ Replacement of 1.76 Km Fail Condition crown failure Sewerage Main Lines in Zone 1 of varying dia 15''-24'' dia ❑ Replacement of Poor Condition 27.5 Km Main & Branch Sewer Lines in Zone 1 & 14 Km poor condition Main and Branch Lines in Zone 2 ❑ Upgradation of 7 Km Main Sewer Lines in Zone 1 with varying dia of 15''- 66'' to cope up increasing flow Areas Covered: Latifabad, Hussain Colony, Karim Town, Seith Colony, Muhallah Alipur, Ameer Colony, Nawab Colony, Lalazar Colony, Qadir Colony, Nasim Fatima Colony, Sabri Colony etc
2	Medium Term (2029)	**Replacement & Upgradation of of 68 Km Sewerage Lines in Zone 3 & 4 of MC Okara (@ 1360 M)** **Scope of Project** ❑ Replacement of 66 Km Poor & outlived sewerage Lines in Zone 3 & 4 having varying dias (12''-54'') ❑ Upgradation of 2 km Poor Condition Main & Branch Line with dia of 12'', 15'' & 18'' Areas covered: Samadpura, Gulshan e Fatima Colony, Garden Town, Jalal Kot, Siddiqe Nagar, Shamas Colony, Kot Nehal Singh, B line Colony, Kot Ghulam Muhammad, Chak 5/4 L, Dubai Town, Samanabad, Raffi Colony, People Colony, Wazir Colony, Chaudhary Colony, Ghafoor Colony, Chak 54/2L, and Yasir Ghaffar Town etc **Extension of 13 km Sewerage lines in Unserved Area within MC Limits (@ 215 M)** ❑ Laying of new sewerage lines of 13.5 Km having dia of 9, 12, 15, 18, 21 & 24'' in unserved area say beside area of Ayub Park, basti Iqbal nagar Z1, near Chak 1/4L Z2, Sidra Ghafoor Town Z4, and Siddique Nagar Z3 **Land Acquisition for WWTP Zone 1 & 2 (@ 800 M)** ❑ Acquire land for Waste Stabilization Pond WSP for Wastewater Treatment for WW generated from Zone 1 51 Acres and 37 Acres for Zone 2 for installation in Long Term and avoid canal water pollution **Wastewater Treatment Zone 3 through Constructed Wetlands (@ 274 M)** ❑ Construction of Constructed Wetlands for Zone 3 Wastewater treatment in Seepage Drain 8.5 Km passing downstream side of Okara City -Provision of Nature based solution for Nullah (2000*15 m) for wastewater treatment with Constructed Wetland (4 pockets of 5*5 m at 4 different patches)
3	Long Term (2034)	**Extension of Sewerage lines in Outskirts of MC Okara towards North East & South East (@ 646 M)** ❑ Laying of 30 Km new sewerage lines having varying dia of 12-36'' in outskirts of MC Okara towards east side covering area of Behari Colony, Chak No 54/2L, Arshad Town, Chak 51/2L and Aftab Colony allied areas **Construction of Waste Stabilization Pond WSP for Zone 1 (51 Acres) & Zone 2 (37 Acres) (@ 900 M)** ❑ Construction of WSP of 11.4 MGD with 51 Acres Land for primary and secondary treatment of Waste Water for Zone 1 Construction of WSP of 8 MGD with 37 Acres Land for primary and secondary treatment of Waste Water for Zone 2
		Sewerage Projects – Okara City: 5798 Million

Okara City – Sewerage Interventions

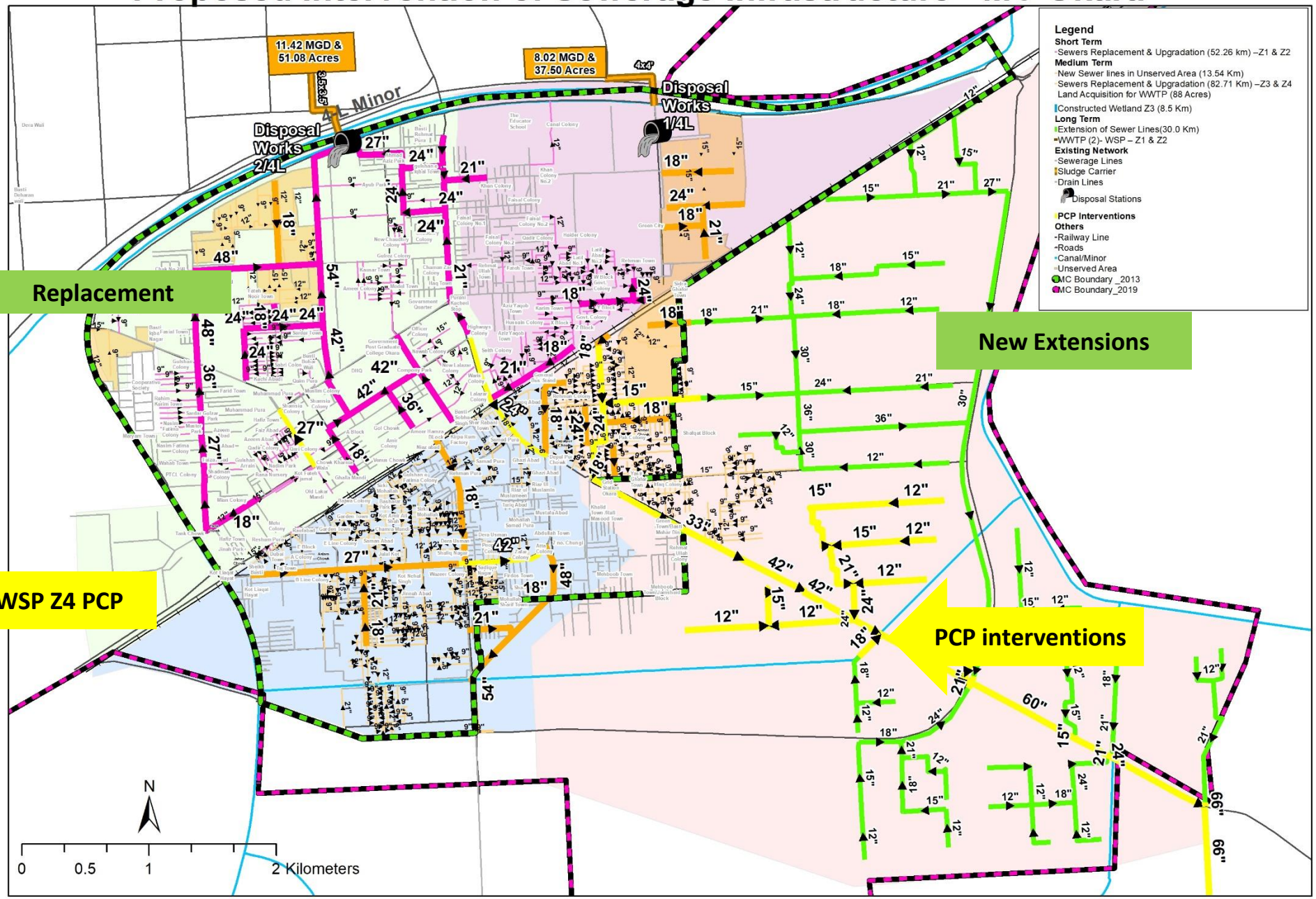
- Sewers Replacement & Upgradation
- New Sewer lines in Unserved Ar
- Extension of Sewer Lines

- Constructed Wetland Z3 (8 Km)
- Land Acquisition for WWTP (88 Acres)
- WWTP (2)- WSP – Z1 & Z2

Reference Map of Sewerage Infrastructure - MC Okar



Proposed Intervention of Sewerage Infrastructure - MC Okara



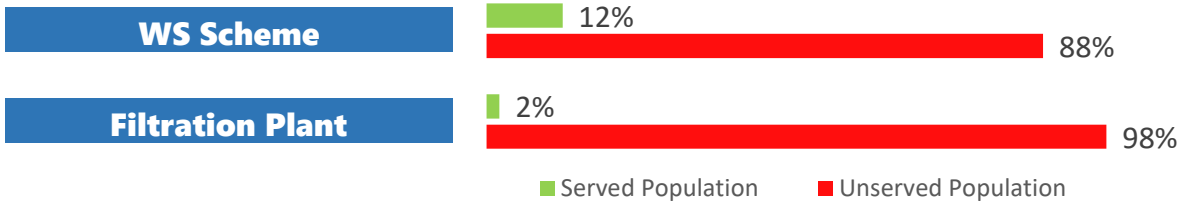
OKARA District

RURAL Water Supply and Sanitation

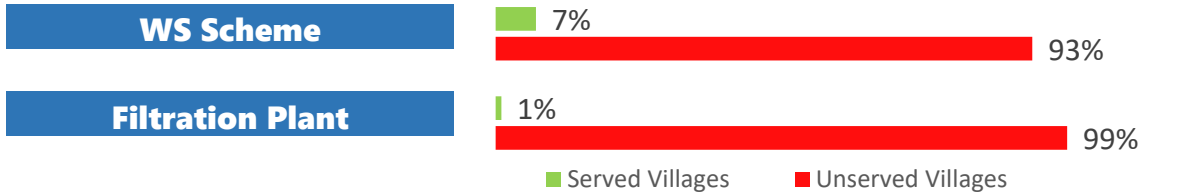
The Urban Unit

Okara Rural – Water Supply System Baseline

Current Population – 2,406,277



Total Villages – 903 Nos



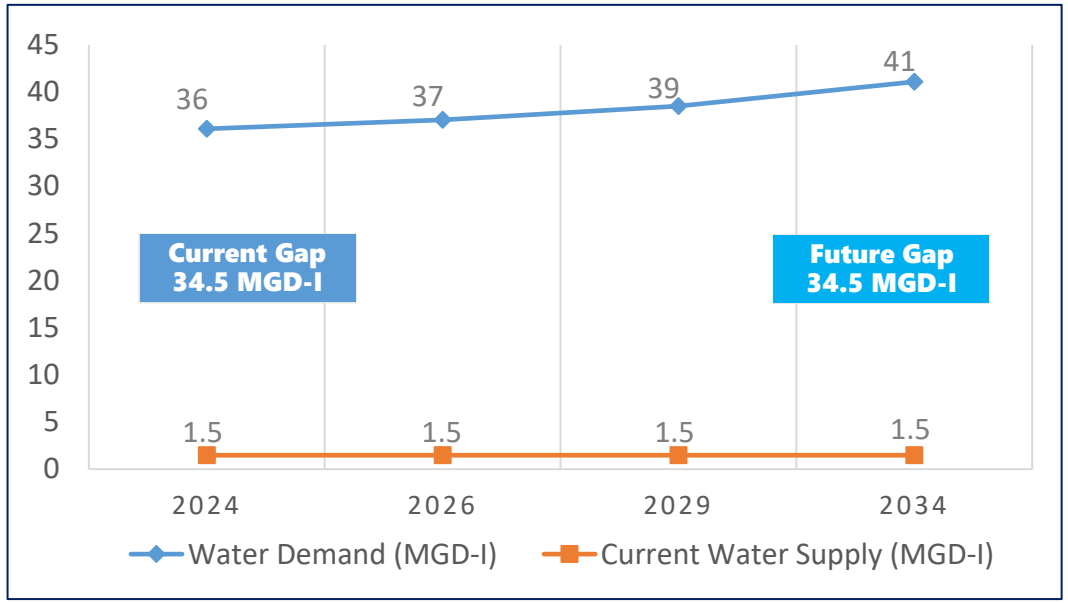
WS Scheme (91 Nos)

Highest (72%) Non Functional Infrastructure in Okara

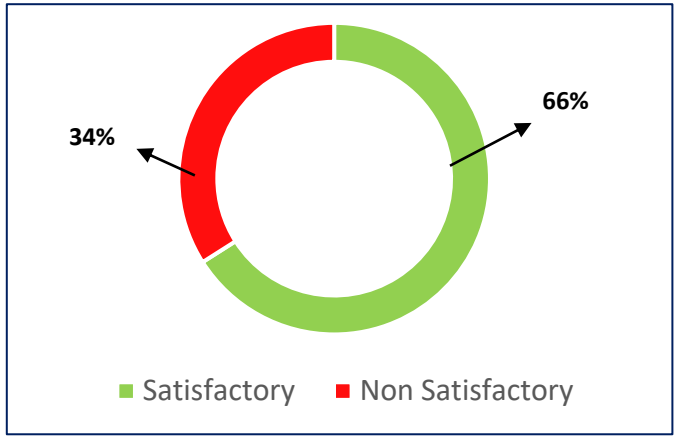
Filtration Plants (10 Nos)

Highest (67%) Non Functional FPs in Depalpur

Water Supply Vs Demand



WS Scheme Condition Assessment



Okara Rural – Site Assessment of Water Supply System

WS Scheme
Chak 31/4L Okara

- Rural Scheme in Brackish Zone
- TDS values higher than 3000 ppm
- Scheme Supplies Water to 175 Nos House Connections and 01 Filtration Plant
- Poor Condition of TW Pump House and Electromechanical Equipment

Proposed Intervention

Rehabilitation of Pump House and Electro Mechanical Equipment. Solarization of WS infrastructure and technical training of concerned personal for effective O& M

WS Scheme

- **Chak 22 4/L – Okara**
- Rural Scheme in Brackish Zone
- TDS value: 3600 ppm
- Water Available to End Users for 2 Hrs/Day
- Scheme Supplies Water to 170 Nos House Connections and 01 Filtration Plant
- PSPs in Streets are in Poor Condition

Proposed Intervention

Rehabilitation of PSPs , Solarization of WS Infrastructure, Provision and technical training of concerned personal for effective O& M

WS Scheme
Chak 18 1/L – Renala Khurd

- Scheme laid in Year 1988
- Rural Scheme in Brackish Zone
- Sewage contamination is occurring due to poor and outlived distribution network
- Scheme Supplies Water to 694 Nos House Connections and 01 Filtration Plant

Proposed Intervention

Replacement of Distribution Network, Solarization of WS infrastructure and technical training of concerned personal for effective O& M

WS Scheme
Dharmay Wala - Depalpur

- Rural Scheme in Brackish Zone
- House Connections : 550 Nos
- Poor Condition of TW Pump House Observed
- Rehabilitation of Civil Structure of TW Pump House and Electromechanical Machinery required

Proposed Intervention

Rehabilitation of Pump House and Electro Mechanical Equipment. Solarization of WS infrastructure and technical training of concerned personal for effective O& M

Okara Rural – Water Supply System

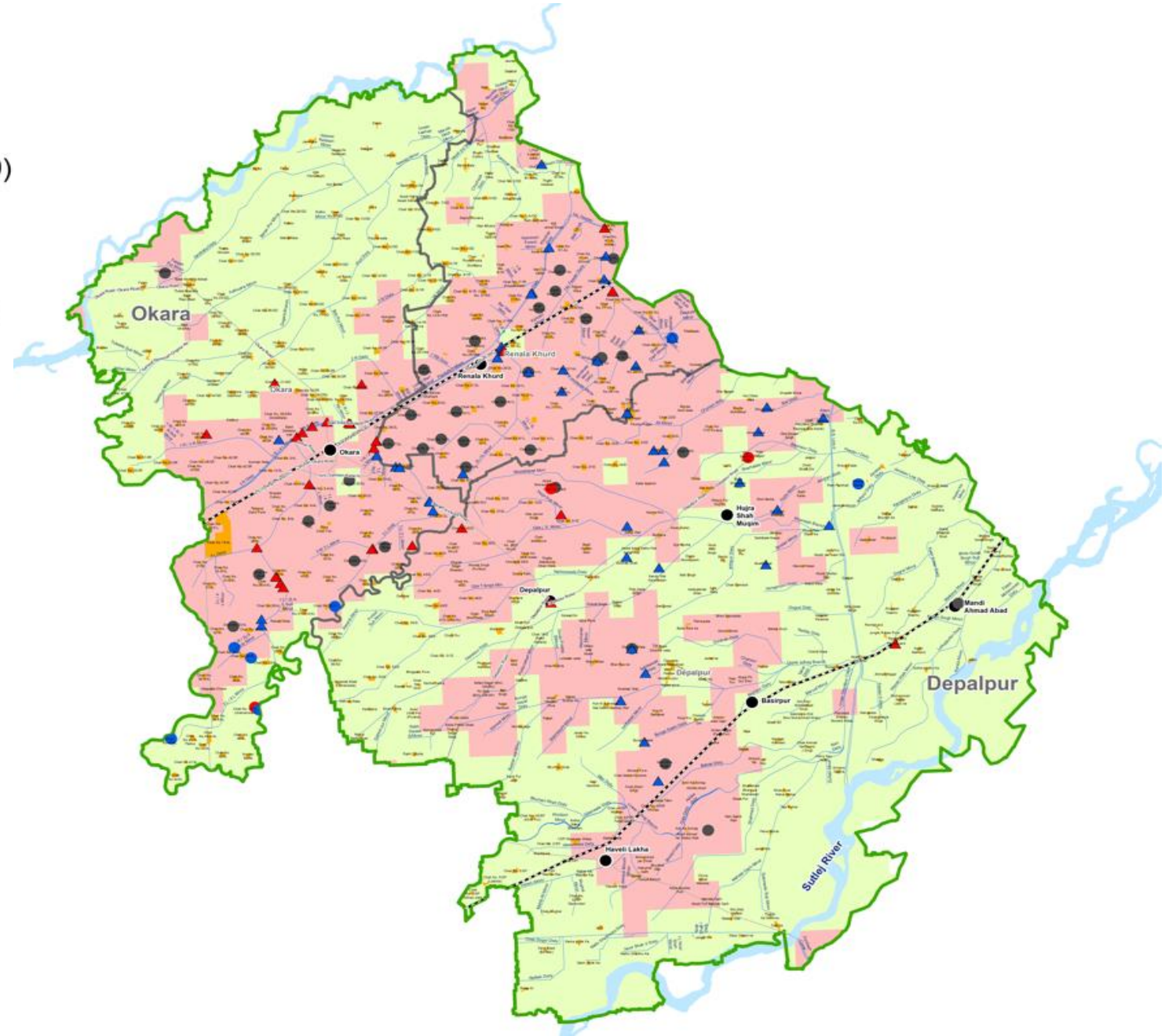
Legend

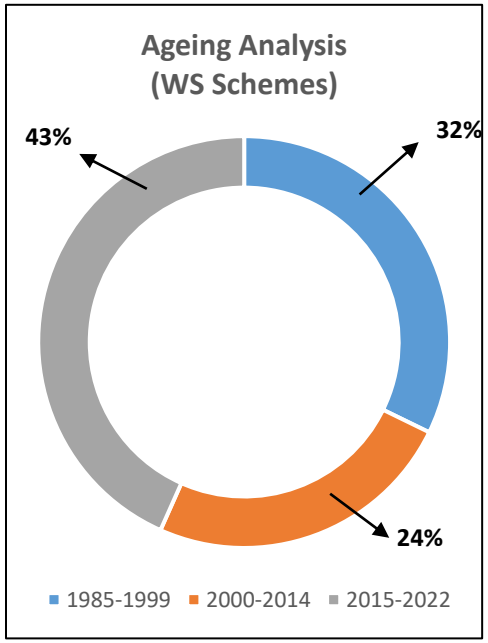
RWSS Scheme
- Functional (62)
- Non-Functional (29)

RWFP Scheme
- Functional (7)
- Non-Functional (3)
- PAPA FP (35)
- City
- Railway Track
- Road Network
- District Boundary
- Tehsil Boundary
- Irrigation Network
- Rural Settlements
- River

TDS (ppm)

Value
- 0 - 1,000
- 1,001 - 8,192

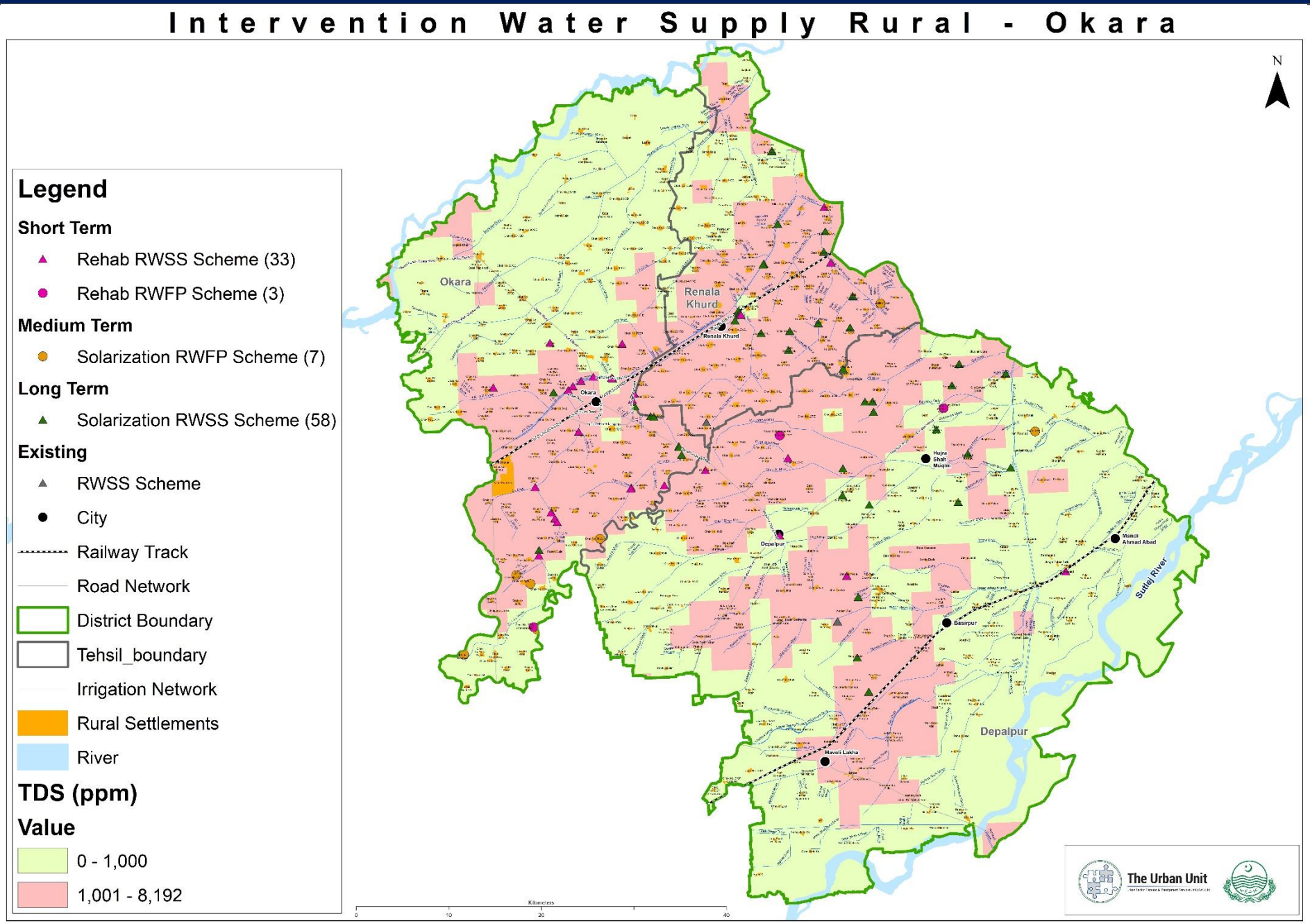




Okara Rural – Water Supply System

Sr.	Project Phase	Proposed Schemes, Estimated Cost & Scope
1	Short Term (2025)	**Rehabilitation of Existing Water Supply Schemes and Filtration Plant in Rural Okara (@707 M)** **Scope of Project** ❑ Rehabilitation of 33 Rural Water Schemes in Rural Okara (23 in Okara, 5 in Depalpur and 5 in Renala Khurd) ❑ Rehabilitation of 3 Rural Water Filtration Plants in Rural Okara (1 in Okara & 2 in Depalpur)
2	Medium Term (2028)	**Solarization of Filtration Plant in Rural Okara (@33 M)** **Scope of Project** ❑ Solarization of 07 Rural Water Filter Plants in Rural Okara (5 in Okara & 2 in Depalpur)
3	Long Term (2033)	**Solarization of Water Supply Schemes in Rural Okara (@560 M)** **Scope of Project** ❑ Solarization of 58 Rural Water Schemes in Rural Okara (Each of 0.25 Cusecs)
		WSS Projects – Okara Rural : 1,300 Million

Okara Rural – WSS Intervention



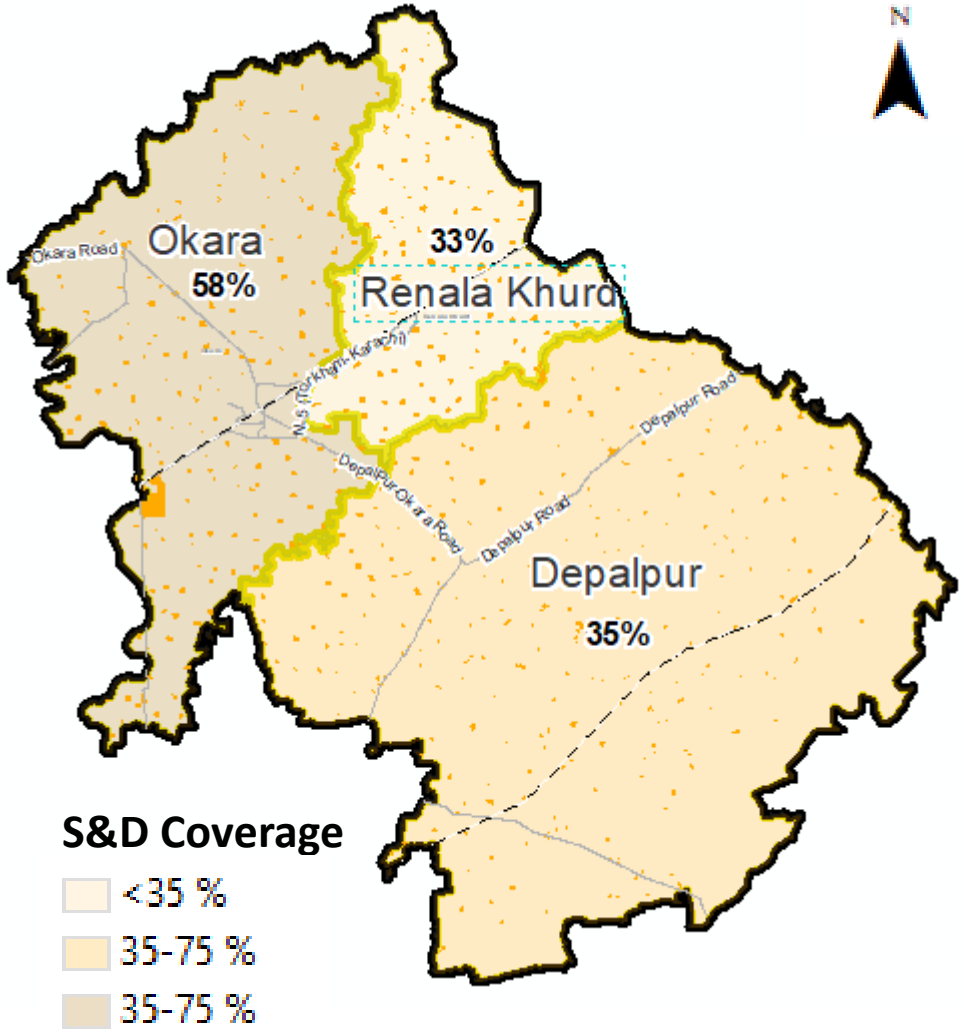
Okara District – Rural Baseline Sewerage & Drainage

Okara
Villages 240
Underground Sewerage Schemes 2
Open Drains Schemes 137

Renala Khurd
Villages 129
Underground Sewerage Schemes 3
Open Drains Schemes 39

Depalpur
Villages 536
Underground Sewerage Schemes 5
Open Drains Schemes 183

Sewerage & Drainage Coverage (%)



- Majorly on Avg 96% open drain based sewerage system exist in all rural areas of Okara District
- 22 Schemes of Drains/Soling/Tiff tiles having worth of 246 M already added in DD package for rural areas of Okara
- Wastewater is dumped in to irrigation and open fields
- Contamination of Water Aquifer due to seepage & disposal of untreated wastewater

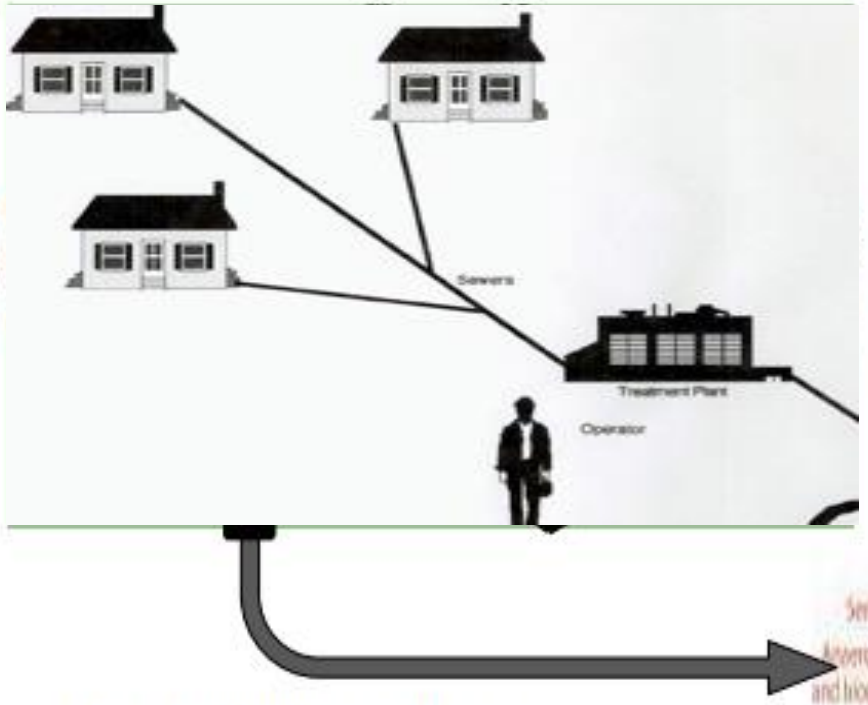
Okara District – Interventions Rural Sewerage & Drainage

Establishment of a Model Village

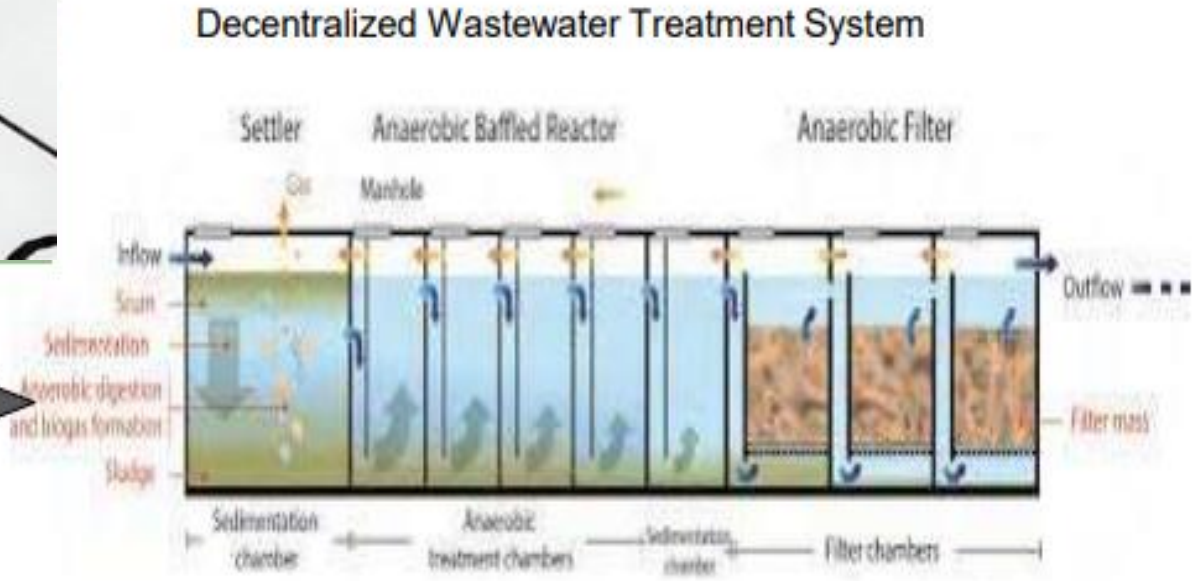
1. Chak No 56/A/D Depalpur
2. Fatuwana Okara
3. Chak 024/1-AL Renala Khurd

Villages having population of Approx. 2000 and 300 Households

- underground sewerage lines
- paved soling streets
- establishment of its associated decentralized wastewater treatment plant



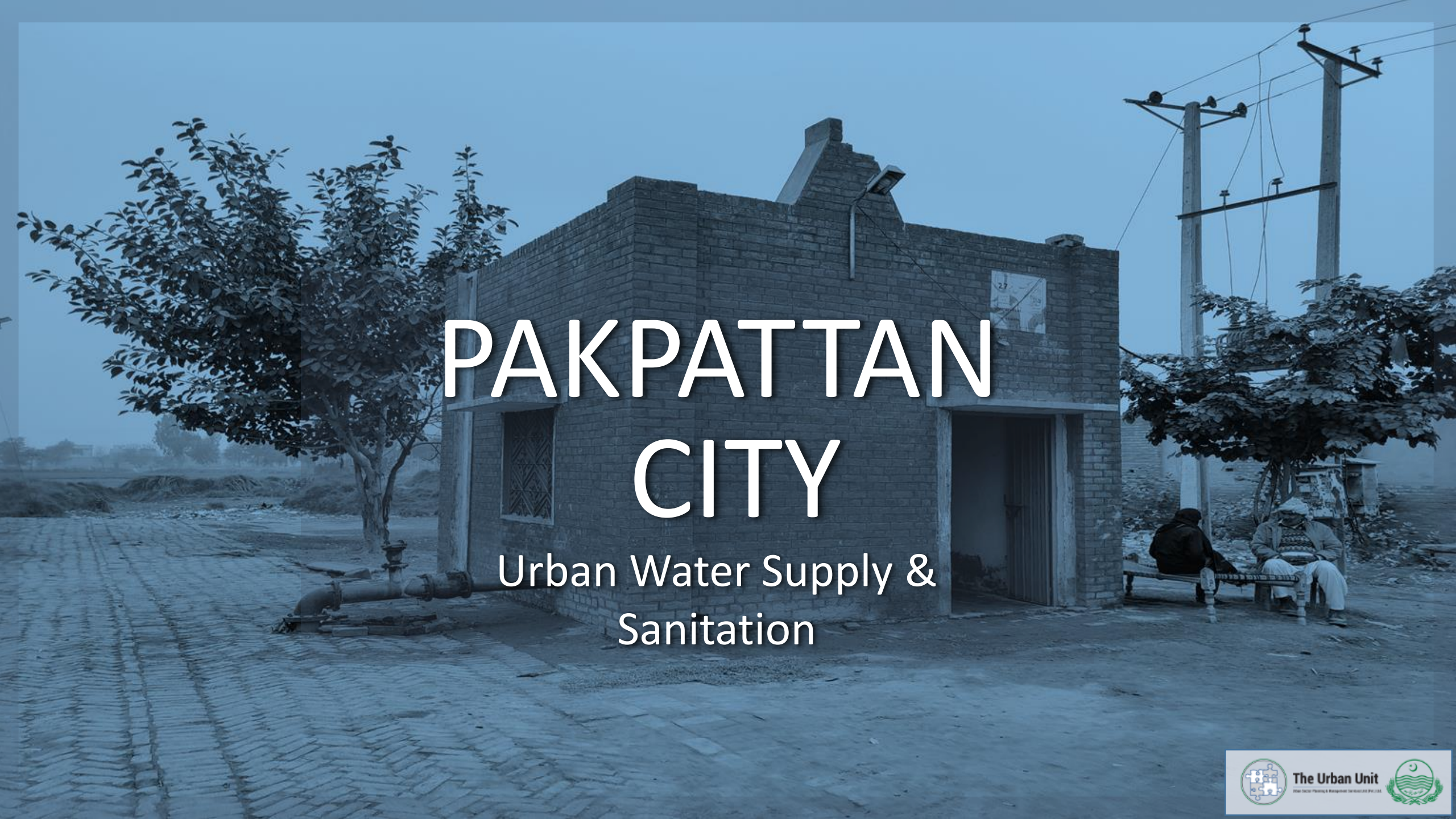
Isolated collection network for small communities < = 1000 HH



Okara District – Interventions Rural Sewerage & Drainage

Sr.	Project Phase	Proposed Schemes, Estimated Cost & Scope
1	Short Term (2026)	Provision of Public Toilets (total 15), 5 in each tehsil of Okara district
		Cost: PKR 6.4 M
2	Medium Term (2029)	Provision of 60 Open Drains based Sewerage/Drainage/Tuff tile/Soling Schemes (10 in Okara), (20 in Depalpur), and (30 in Renala Khurd)
		Cost: PKR 549 M
3	Long Term (2034)	Proposal of 3 Model Villages *(1 Village in each tehsil with 300 Households) in Okara District* covered sewerage system, paved streets, and decentralized wastewater treatment plant
		Cost: PKR 279 M
		Rural Drainage/Sewerage Projects – Okara District: 835 Million

PAKPATTAN
DISTRICT



PAKPATTAN CITY

Urban Water Supply & Sanitation

The Urban Unit

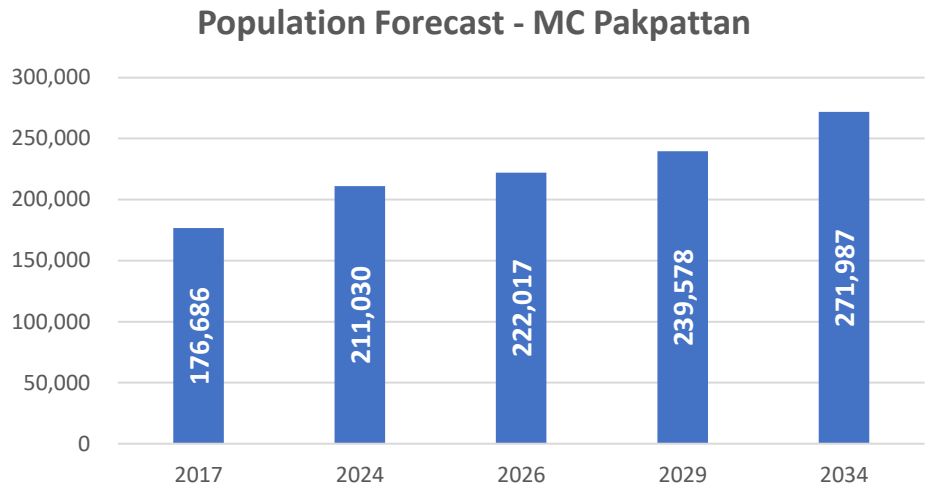
Pakpattan City Brief

❑ LOCALITY

- Pakpattan is the capital city of Pakpattan District & is located towards North of River Sutlej

❑ POPULATION

- 48th largest city of Pakistan by population as per Census 2017
- **Currently (2023)** population being **205,743**
- **Forecasted (2034)** population to be **271,987**



Water Supply

- WS Coverage is around **+90% (spatially).** Most of the City is **Served** with MC owned **Water Supply Scheme**.
- ✓ The city has approximately **9,282 Domestic & 76 Commercial Connections**.

- The Water Quality of Pakpattan is **Excellent**
- ✓ (pH: 7.9, TDS: 286, EC 579 on Average)

- WS Pipeline is in **FAIR** condition in most of city with some **Problematic** Lines.

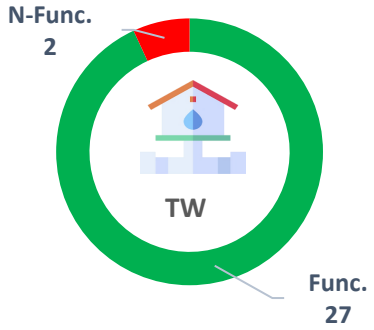
Sewerage

- City is served mostly **+90% (spatially)** with sewers & 05 Disposal Stations (All functional)
- Tiba Sherkot Disposal is the oldest disposal works established in 1982 (≈60 City's Disposal)

- Major reported issues are **Crown Failure** of Trunk sewers & re-routing of Trunks to shorter disposal paths

- There is **No Waste Water Treatment** mechanism and sewage is being discharged in Agricultural Field

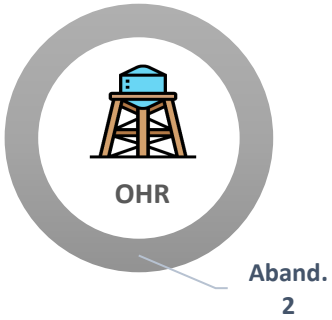
Pakpattan City – Status of Water Supply Infrastructure



Tube Wells

Source of water in the city is groundwater extraction through **Tube Wells (29 Nos.)**

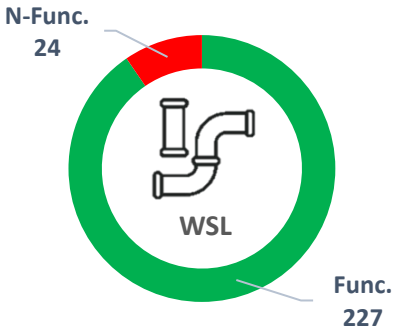
- ✓ **27/29 Functional Tube Wells**
- ✓ **02/29 Non-Functional Tube Wells**



Overhead Reservoirs

OHRs (02 Nos.) in the city are abandoned & direct water supply is adopted

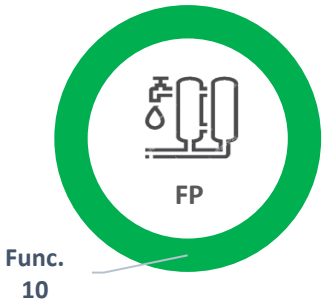
- ✓ **0/2 Functional OHR**
- ✓ **2/2 Non-Functional OHR** (Abandoned)



Water Supply Lines

Water Supply Lines **(252 KM)** are provided in almost 90% of the city.

- ✓ **227 KM Functional WSL**
- ✓ **24 KM Non-Functional WSL**



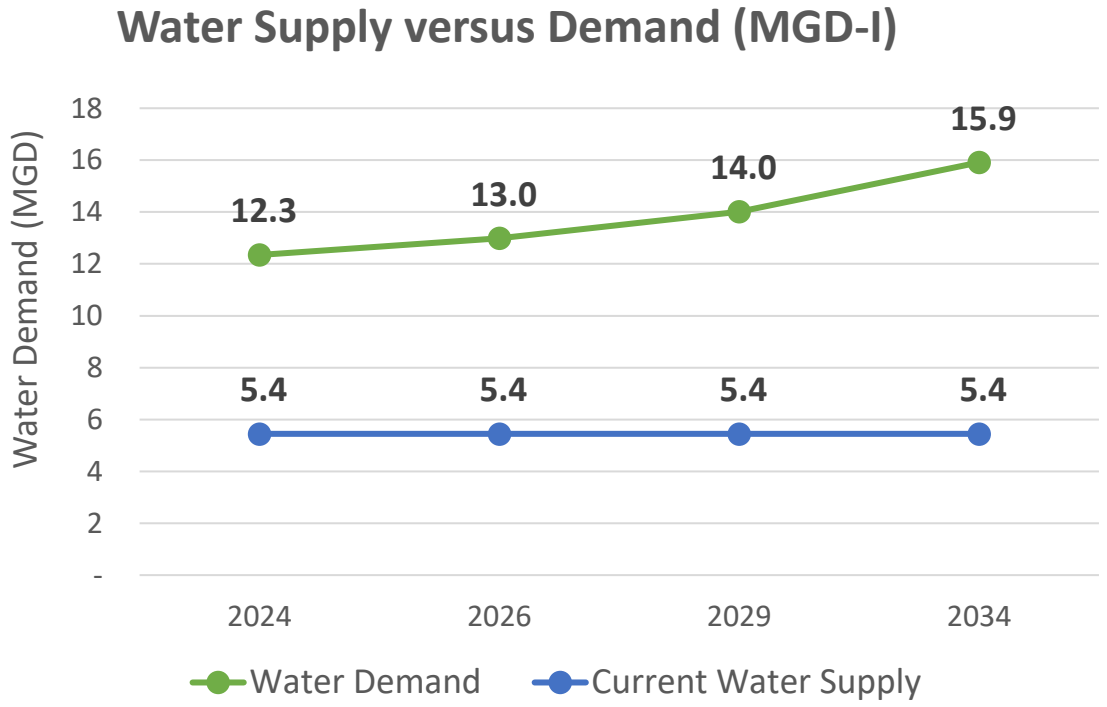
Filtration Plants

UF type **FPs (10 Nos.)** are provided across the city for supply of drinking water

- ✓ **10/10 Functional FP**
- ✓ **0/10 Non-Functional FP**

Key Features

- ✓ **Direct Water Supply** system adopted in city
- ✓ TW operational time vary from **6 to 16 Hrs. /day**
- ✓ 2 TWs currently non-functional due to **Damaged Distribution System**.



Pakpattan City – Condition Assessment of Water Supply Infrastructure

Most assets in city are in **Good Condition** with **83%** assets being only 10-12 years old.

Proper **Chlorination Mechanism** observed at all tube wells in the city & Most of tube wells have working bulk meters.

Moisture Damage observed in Civil Structures at some areas & **Over-Lived Machinery** observed at 5 sites.

2 TWs currently **Non-Functional** due to damaged distribution network indicating need for replacement.

Direct Supply System is adopted in the city for water supply with tube wells being operated for **6 to 16 hours/day**.

Overall Asset Condition	Rating
Civil Structures	**B** (62% in **Good** Condition)
Distribution Network	**C** (90% in **Fair** Condition)
Electro-Mechanical	**B** (59% in **Good** Condition)

Rating	Asset Condition	Description
A	Excellent	No noticeable defects. Some aging or wear may be visible
B	Good	Only minor deterioration or defects are evident
C	Fair	Some deterioration or defects are evident, but function is not significantly affected
D	Poor	Serious deterioration in at least some portion of the structure. Function is inadequate
F	Failing	No longer functional. General failure or complete failure of a major structural component

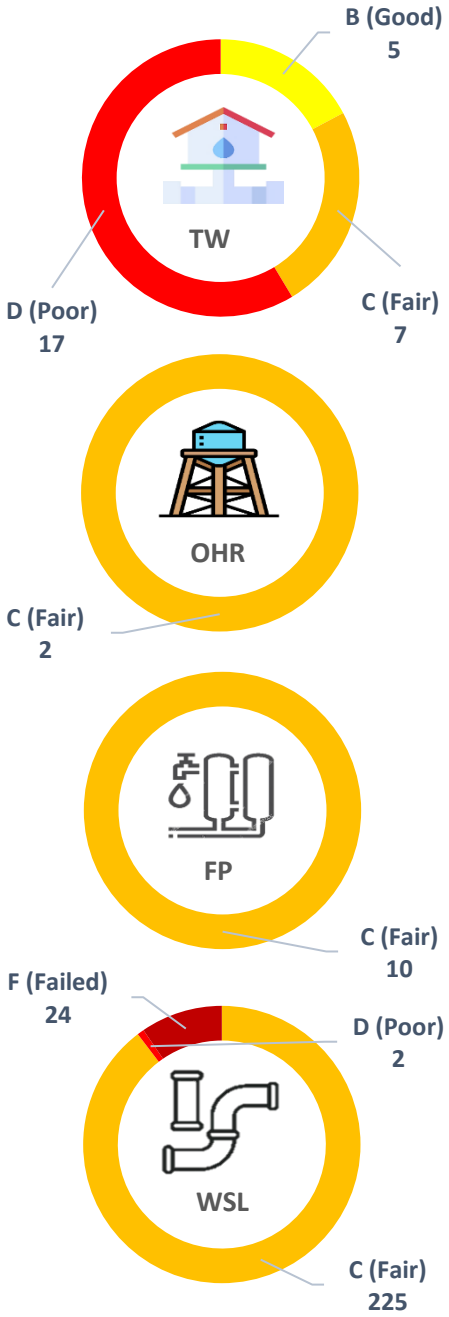
A tube well installed in 1992. The **Poor Condition** of the asset is evident from the over-lived pumping machinery & moisture damage on walls. **17%** TWs in the city are in a similar state.

Good Condition of pumping machinery at a tube well in Pakpattan. It should be noted that all TWs in the city are equipped with proper chlorination mechanism and most have working bulk meters.

Electrical assessment being performed at a TW in Pakpattan. A power factor of 97.2% on average across 3 phases was observed. **83%** Electrical Panels were found to be in **Satisfactory Condition**.

TDS value of **316 ppm** was observed during Rapid Water Quality Testing. Pakpattan is blessed with sweet groundwater (average TDS values 286 ppm) with water table on average being 70-80 ft.

Pakpattan City – Baseline Map for Water Supply



Legend

FP Condition
- C - Fair (10)

TW Condition
- B - Good (17)
- C - Fair (7)
- D - Poor (5)

OHR Condition
- Abandoned (2)

WSL Condition

Rising Main
- C - Fair (18 km)
- D - Poor (02 km)
- F - Fail (08 km)

Distribution (3"/4")
- C - Fair (207 km)
- F - Fail (16 km)

Others
- Railway Track
- Road Network
- Irrigation Network
- Unserved Area
- Urban Limit (PLGA 2013)
- Urban Limit (PLGA 2019)

Currently unserved due to damaged distribution network

Depalpur Road
Pakpattan Canal Upper
Hospital Road
Fareed Nagar Road
Tabbar Minor
Green Town Sahiwal
Sahiwal Road
Railway Road
Mandir Road
Thana Road
Pir Ghani Road
Pakpattan Bypass
Pakpattan Disty
Khadir Branch
Hola Road
Malik Pur Disty
Chan Pir Road
Behram Pur Disty
Pakpattan Minchinabad Road

N

Kilometers
0 0.5 1 2

The Urban Unit

Source: Field Survey (Jan 2024) - The Urban Unit

Pakpattan City – Water Supply Projects

Sr.	Phase	Proposed Schemes, Estimated Cost & Scope
1	Short Term (2026)	**Pakpattan Water Supply Improvement Project - Phase I (136 M)** **Scope of Project** ❑ Provision of 02 new TWs having capacity of 1.5 cusecs each (21 M) ❑ Service/Repair of 5 existing TWs including (0.7 M) ✓ Service of Machinery ✓ Electrical Panels ✓ Repair/Repaint of Civil Work as needed ❑ Replacement of Problematic Line/Rising Mains of 24 KM length (114 M)
2	Medium Term (2029)	**Pakpattan Water Supply Improvement Project - Phase II (32 M)** **Scope of Project** ❑ Provision of 03 new TWs having capacity of 1.5 cusecs each (31 M) ❑ Service/Repairs of 7 existing TWs including (1 M) ✓ Service of Machinery ✓ Electrical Panels ✓ Repair of Civil Work as needed
3	Long Term (2034)	**Pakpattan Water Supply Improvement Project - Phase III (75 M)** **Scope of Project** ❑ Provision of 05 new TWs having capacity of 1.5 cusecs each (52 M) ❑ Rehabilitation of 5 existing TWs including (23 M) ✓ Replacement of Machinery ✓ Electrical Panels ✓ Repair of Civil Work as needed
		Water Supply Projects – Pakpattan City: 243 Million

Pakpattan City – Interventions Map for Water Supply

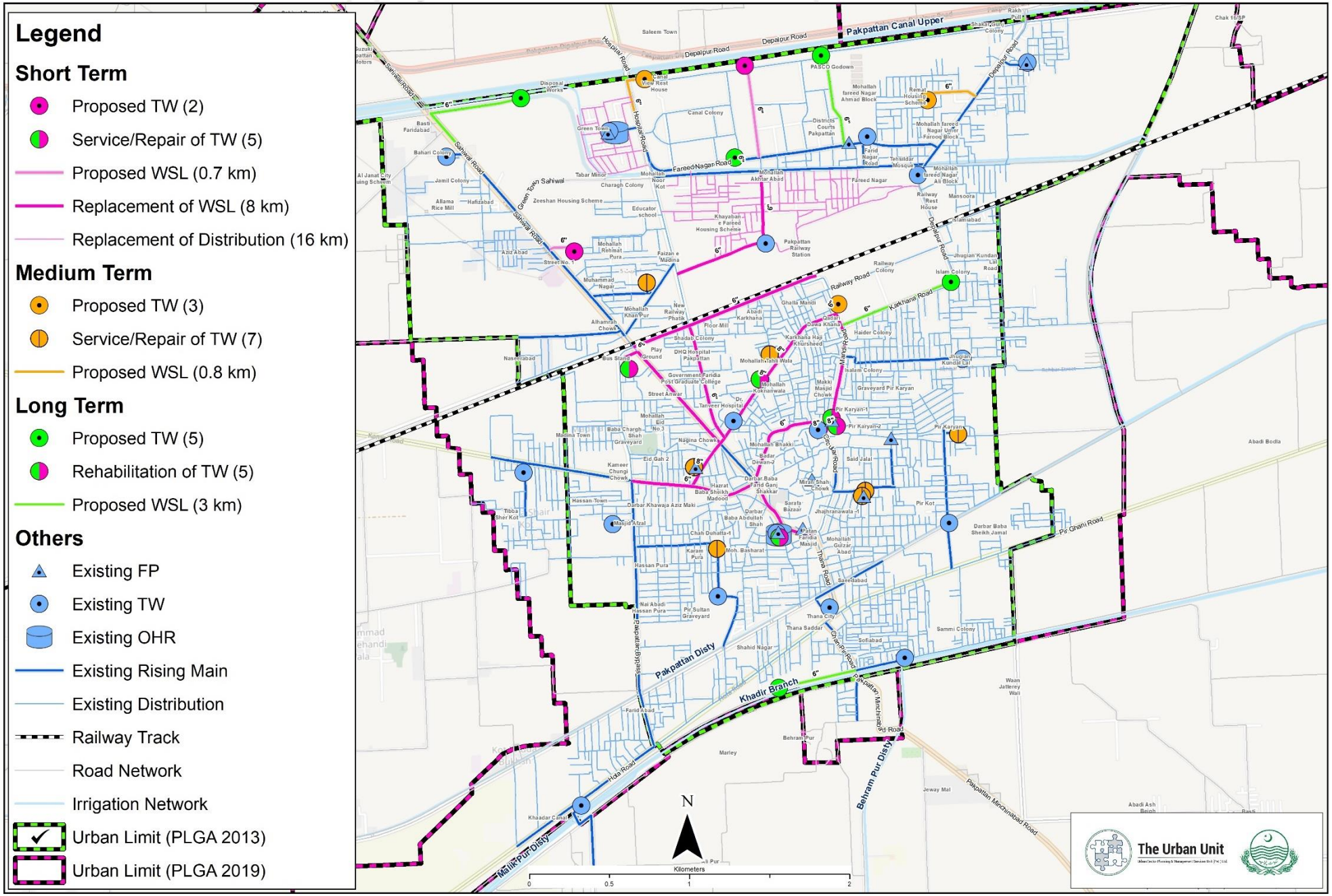
Replacement of damaged water lines & rising mains for **Operationalization** of currently unserved areas

Phase-wise **Service/Repair** & **Replacement** of pumping machinery and electrical panels at TWs across the city for optimal working

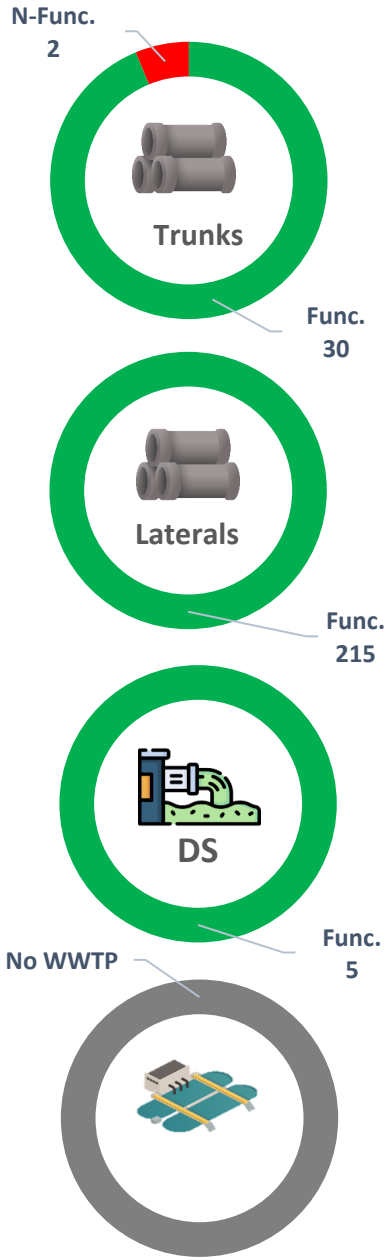
2 TWs (*1.5 cusecs each*) complete with Rising Main & Auxiliary works proposed to be provided in **Short Term**

3 TWs (*1.5 cusecs each*) complete with Rising Main & auxiliary proposed to be provided in **Medium Term**

5 TWs (*1.5 cusecs each*) complete with Rising Main & auxiliary works proposed to be provided in **Long Term**



Pakpattan City – Status of Sewerage Infrastructure



Trunk Sewers

- ✓ 30/32 KM Functional
- ✓ 02/32 KM Dysfunctional

Lateral Sewers

- ✓ 215/215 KM Functional
- ✓ 0/0 Dysfunctional

Disposal Works

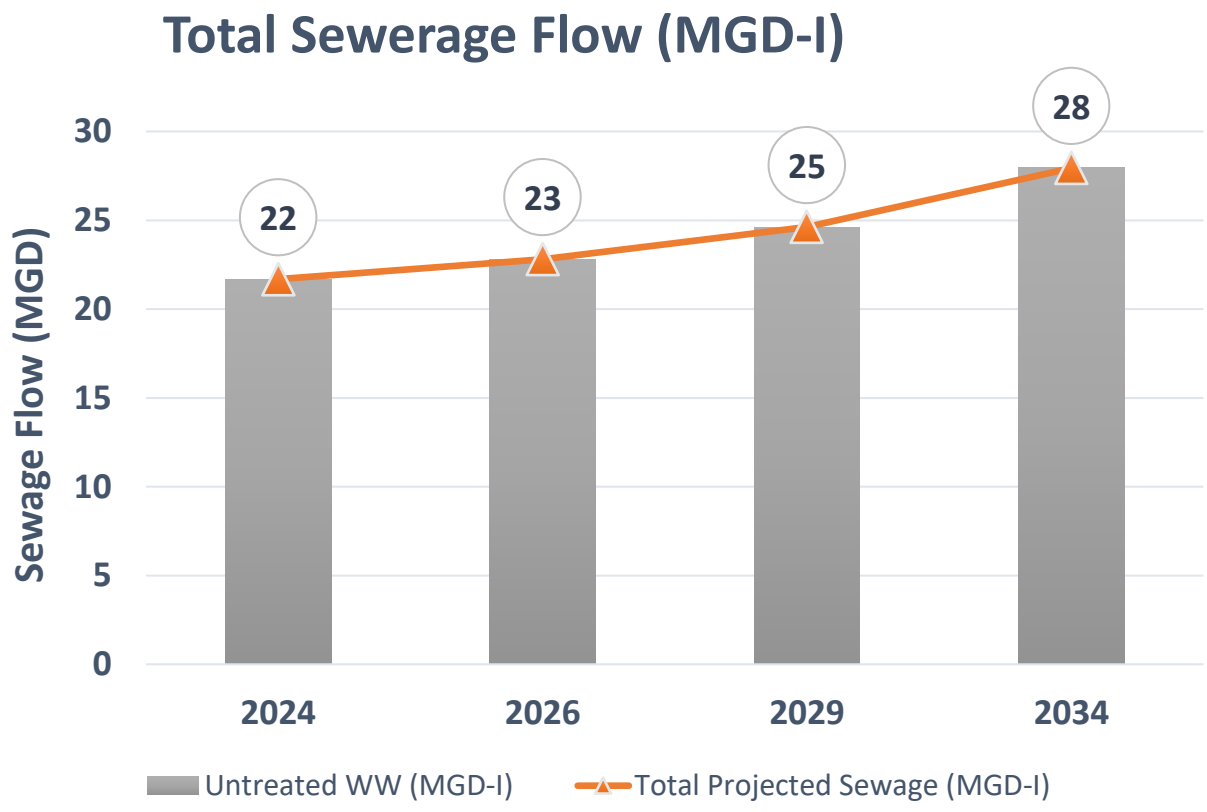
- ✓ 5/5 Functional
- ✓ 0/0 Dysfunctional

Waste Water Treatment Plant

- ✓ No WWTP Available

Key Features

- ✓ **Full Coverage** in city (PLGA 2013)
- ✓ Five (05 Nos) Disposal Stations



Pakpattan City – Condition Assessment of Sewerage Infrastructure

Outdated Sewerage Network (40 Years old)

Problematic Trunk Sewers (Crown failures)

Planning Issues, requiring re-routing of trunks

Outdated/Problematic Main DS (Tiba Sherkot)

Non-existent Waste Water Treatment Facility

Overall Condition	Rating
Civil Structures	**C** (75% in **Fair** & 25% in **Good** Condition)
Sewers	**C** (96% in **Fair** & 3% in **Poor** Condition)
Electro-Mechanical	**C** (75% in **Fair** & 25% in **Good** Condition)

Rating	Asset Condition	Description
A	Excellent	No noticeable defects. Some aging or wear may be visible
B	Good	Only minor deterioration or defects are evident
C	Fair	Some deterioration or defects are evident, but function is not significantly affected
D	Poor	Serious deterioration in at least some portion of the structure. Function is inadequate
F	Failing	No longer functional. General failure or complete failure of a major structural component

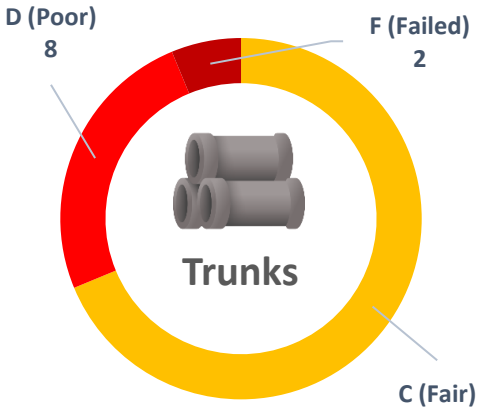
Direct Disposal of waste water into Irrigation Canal

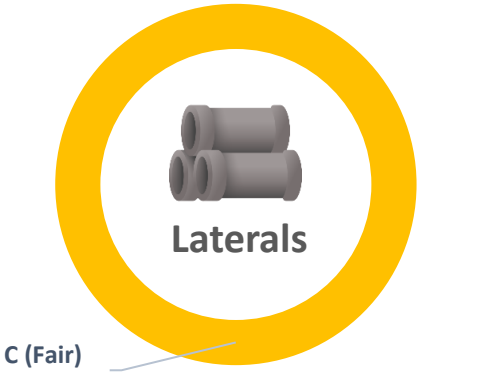
Wells Assessment of Main Disposal Station Tiba Sherkot

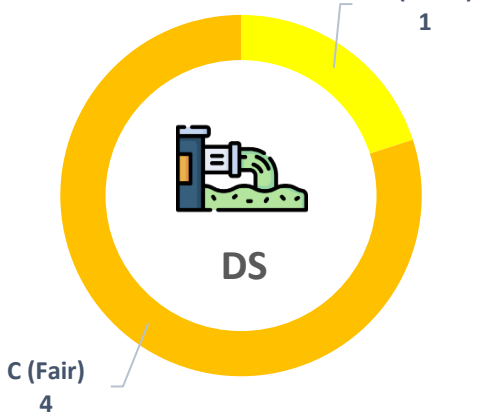
Machinery Assessment of Main Disposal Station Tiba Sherkot

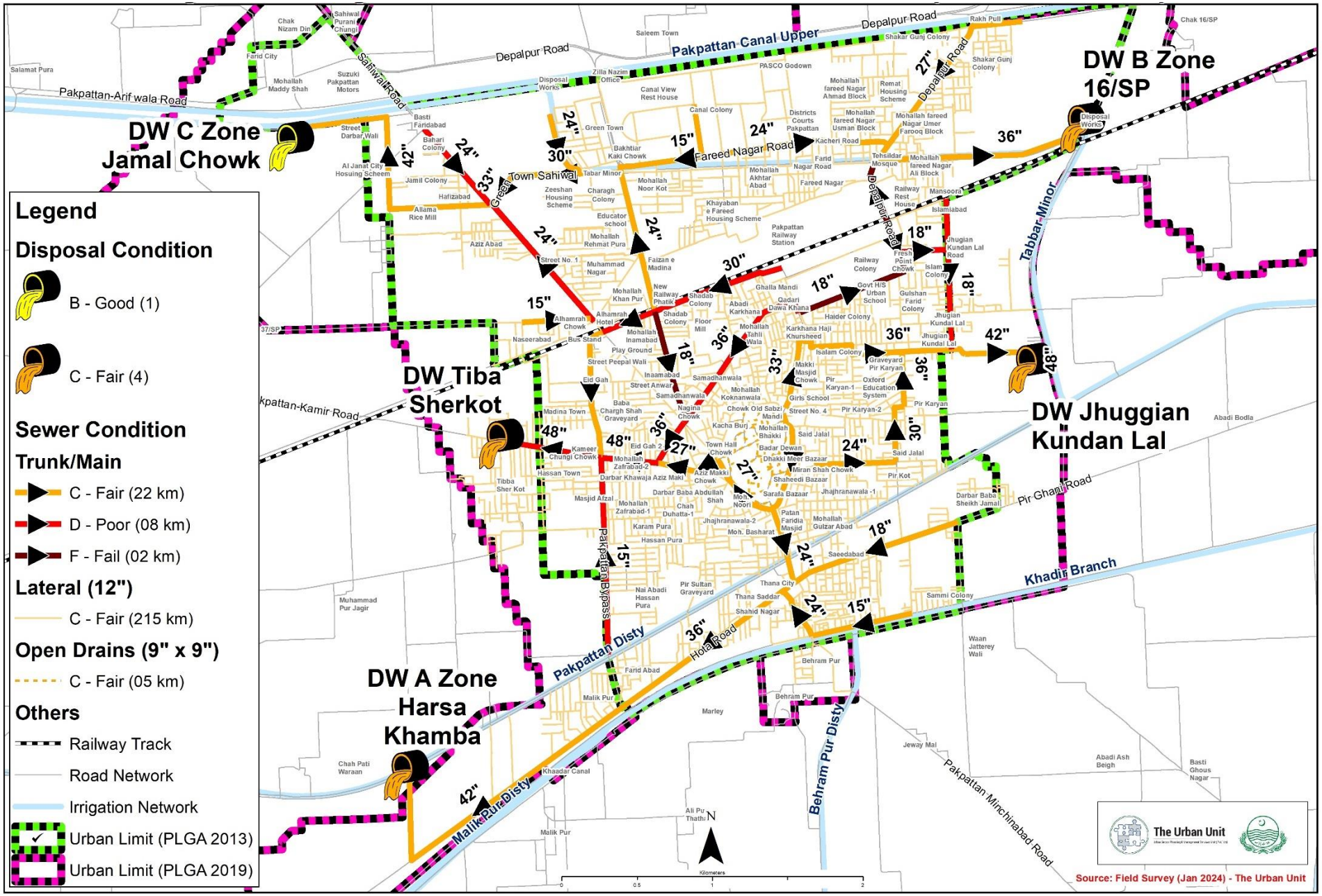
Electric Panel Assessmentof Disposal Station C Zone Jamal Chowk

Pakpattan City – Sewerage Infrastructure Baseline Map



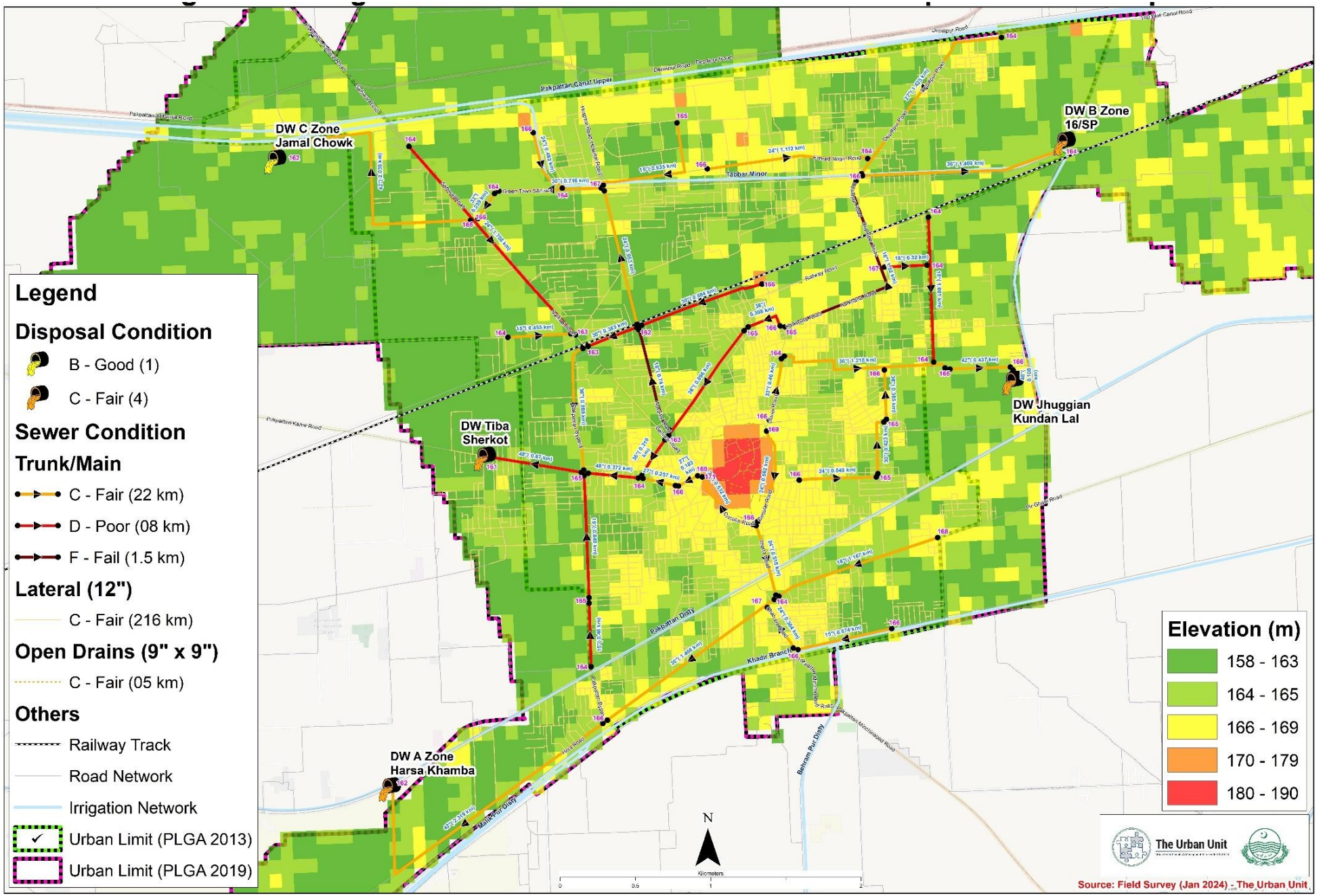






Pakpattan City – Sewerage Infrastructure Baseline Elevation Map

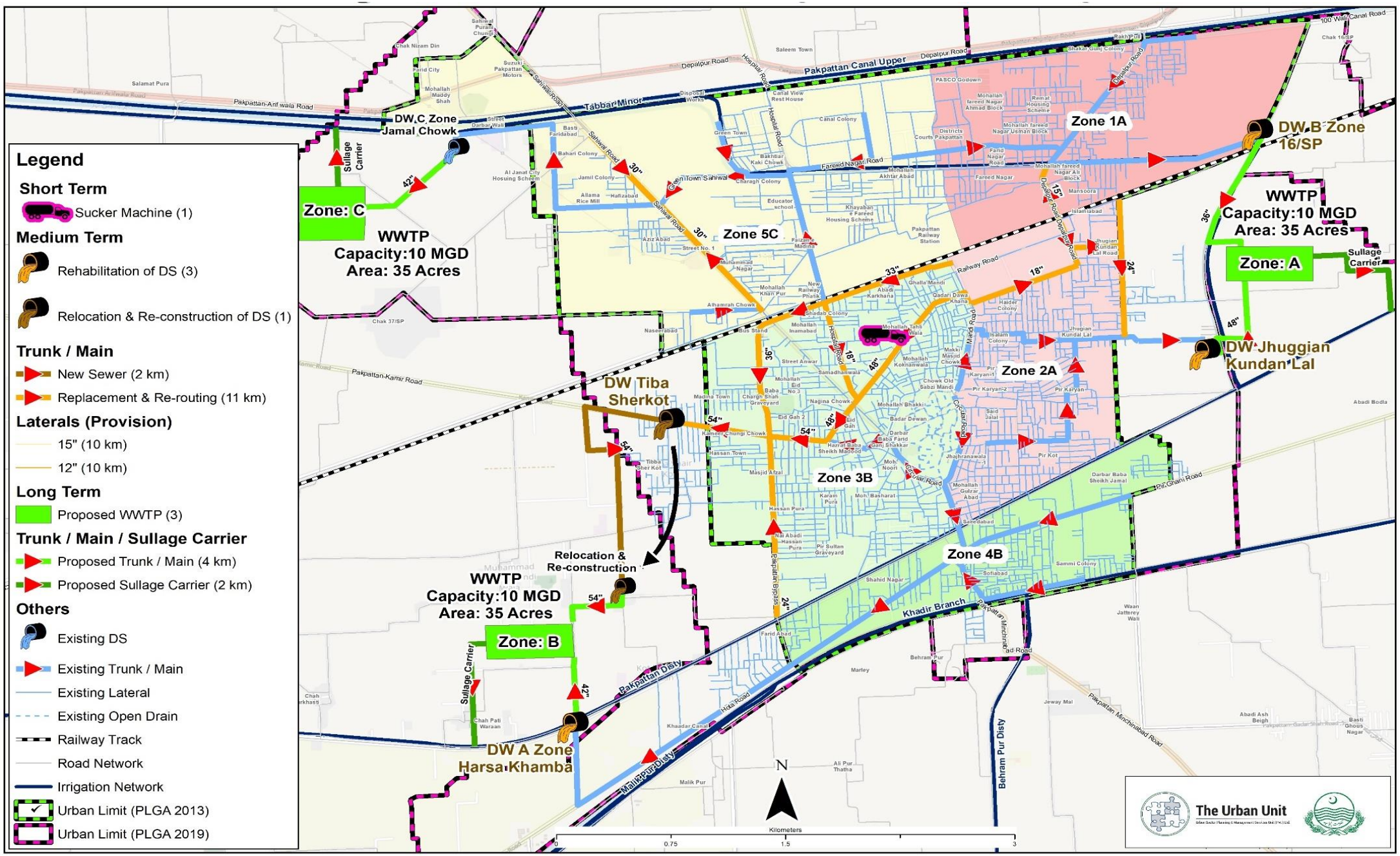
Terrain:
Mostly Plain other than Dhakki (Man-made Hill) 11 m or 35 ft

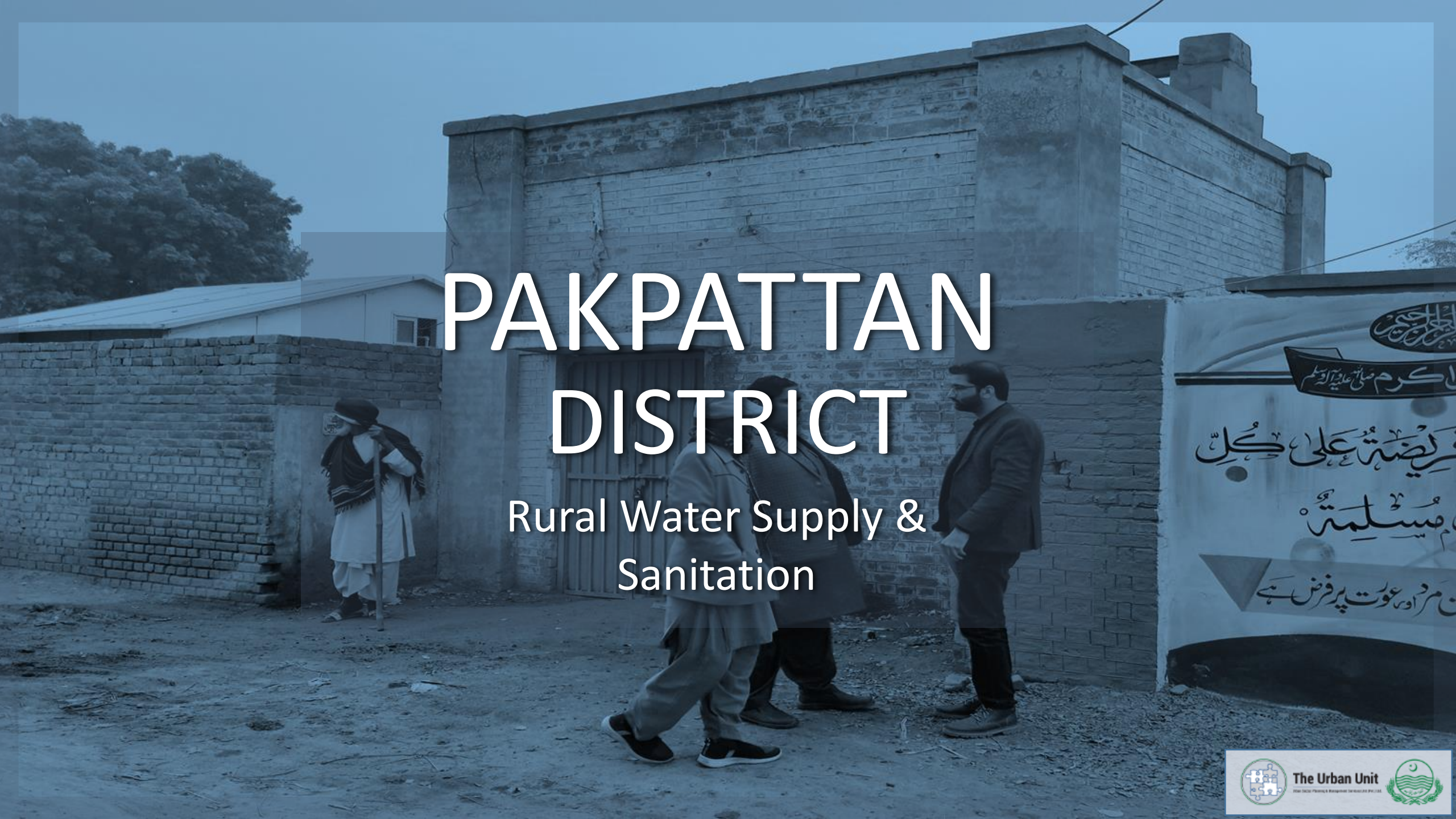


Pakpattan City – Sewerage Projects

Sr.	Phase	Proposed Schemes, Estimated Cost & Scope
1	Short Term (2026)	**Sewerage System Machinery Procurement for Pakpattan City (@56 M)** **Scope of Project** ❑ Procurement of Sucker Machine for sewerage system maintenance
2	Medium Term (2029)	**Comprehensive Sewerag System Rehabilitation Scheme for Pakpattan City (@1,213 M)** **Scope of Project** ❑ Replacement and Re-routing of existing outdated and problematic trunks – 417 M ❑ Provision for lateral sewer replacement (12'' @10 km and 15'' @ 10 km) – 304 M ❑ New Trunk Sewer (54" @ 2 Km)- 143 M ❑ Relocation and Re-construction of outdated main DS Tiba Sherkot – 234 M ❑ Rehabilitation of three existing Disposal Stations (DS Harsa Khamba, DS Jhuggian Kundan Lal and DS 16/SP) – 130 M
3	Long Term (2034)	**Construction of three WSPs in Pakpattan City at five Disposal Stations (@2,223 M)** **Scope of Project** ❑ Construction of WSP of 3 @ 10 MGD of 35 Acres Land (each) for primary and secondary treatment of Waste Water at (1) DS Jhuggian Kundan Lal and DS 16/SP (2) DS Tiba Sherkot and DS Harsa Khamba (3) DS Jamal Chowk - 2,223 M
		Sewerage Projects (3) – Pakpattan City: 3.5 Billion

Pakpattan City – Sewerage Interventions Map





PAKPATTAN DISTRICT

Rural Water Supply & Sanitation

The Urban Unit

Pakpattan District – Baseline of Rural Water Supply Schemes

Baseline of RWWS (PHED)

Current Rural Population = 1,733,469 Nos

- ✓ **Served Population = 220,466 (13%)**
- ✓ **Unserved Population = 1,513,003 (87%)**

Tube-Well based Water Supply Schemes **(67 Nos)** Installed by PHED

- ✓ **76% – Functional Schemes (51 Nos)**
- ✓ **16% – Dysfunctional Schemes (11 Nos)**
- ✓ **7% – Abandoned Schemes (5 Nos)**

Scheme installed in phases from 1984 to 2020.

- ✓ **31% - Schemes < 10 years old (21 Nos)**
- ✓ **61% - Schemes 10 - 25 years old (41 Nos)**
- ✓ **8% - Schemes 25 - 40 years old (5 Nos)**

Key Issues

100% of schemes have on-grid supply from WAPDA & Most of **dysfunctional schemes** are due to non-payment of WAPDA dues indicating the need of **Solar based Interventions**

Lack of Public Interest as 70% area is Sweet water zone. Only 20 Nos RWWS in Brackish water zones (30% of district rural)

Current Scenario (2024)

Water Demand = 26 MGD

Current Supply = 2 MGD

- ✓ Functional TWs = 53 Nos
- ✓ Average Capacity = 0.25 cusecs
- ✓ Average Operational = 6 Hours

Current Gap = 2 MGD

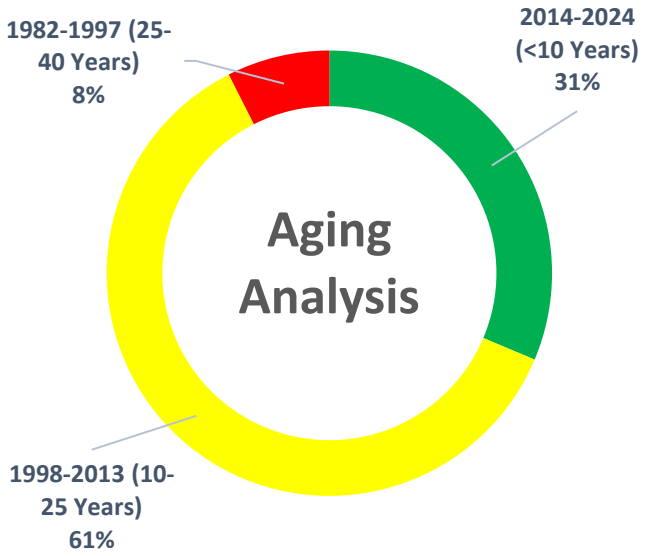
Future Scenario (2034)

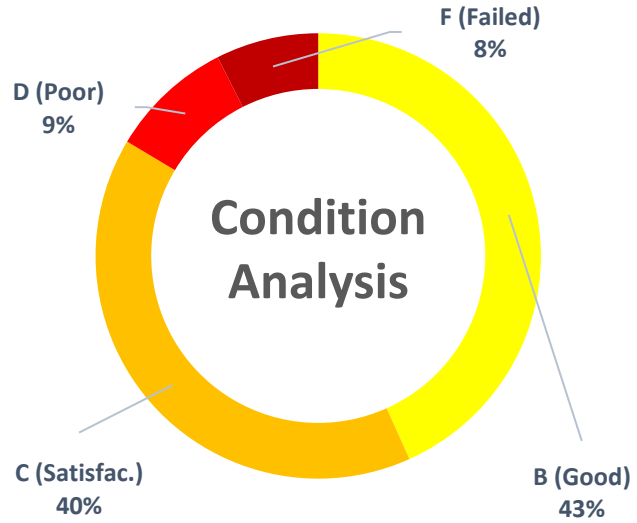
Water Demand = 31 MGD

Future Supply = 3 MGD

- ✓ After Rehab TWs = 76 Nos
- ✓ Average Capacity = 0.25 cusecs
- ✓ Average Operation = 6 Hours

Future Gap = 28 MGD





Pakpattan District – Baseline of Rural Filtration Schemes

Baseline of Filtration Schemes

Current Rural Population = 1,733,469 Nos

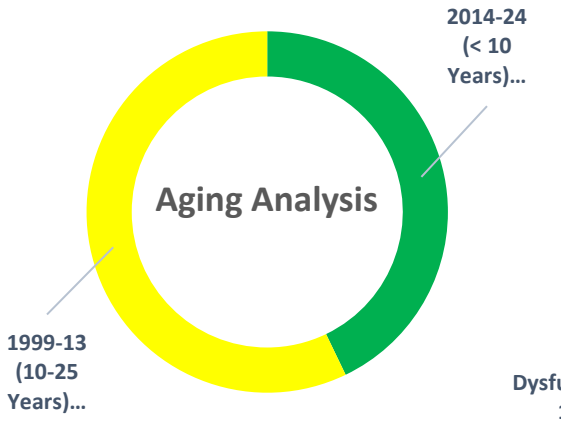
- ✓ **Served Population = 349,468 (20%)**
- ✓ **Unserved Population = 1,384,001 (80%)**

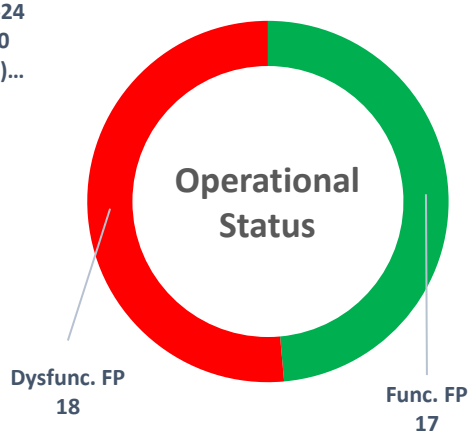
Filtration Plants (35 Nos) for supply of drinking water in rural communities

- ✓ **49% – Functional Schemes (17 Nos)**
- ✓ **51% – Dysfunctional Schemes (18 Nos)**

Scheme installed in phases from 2011 to 2018.

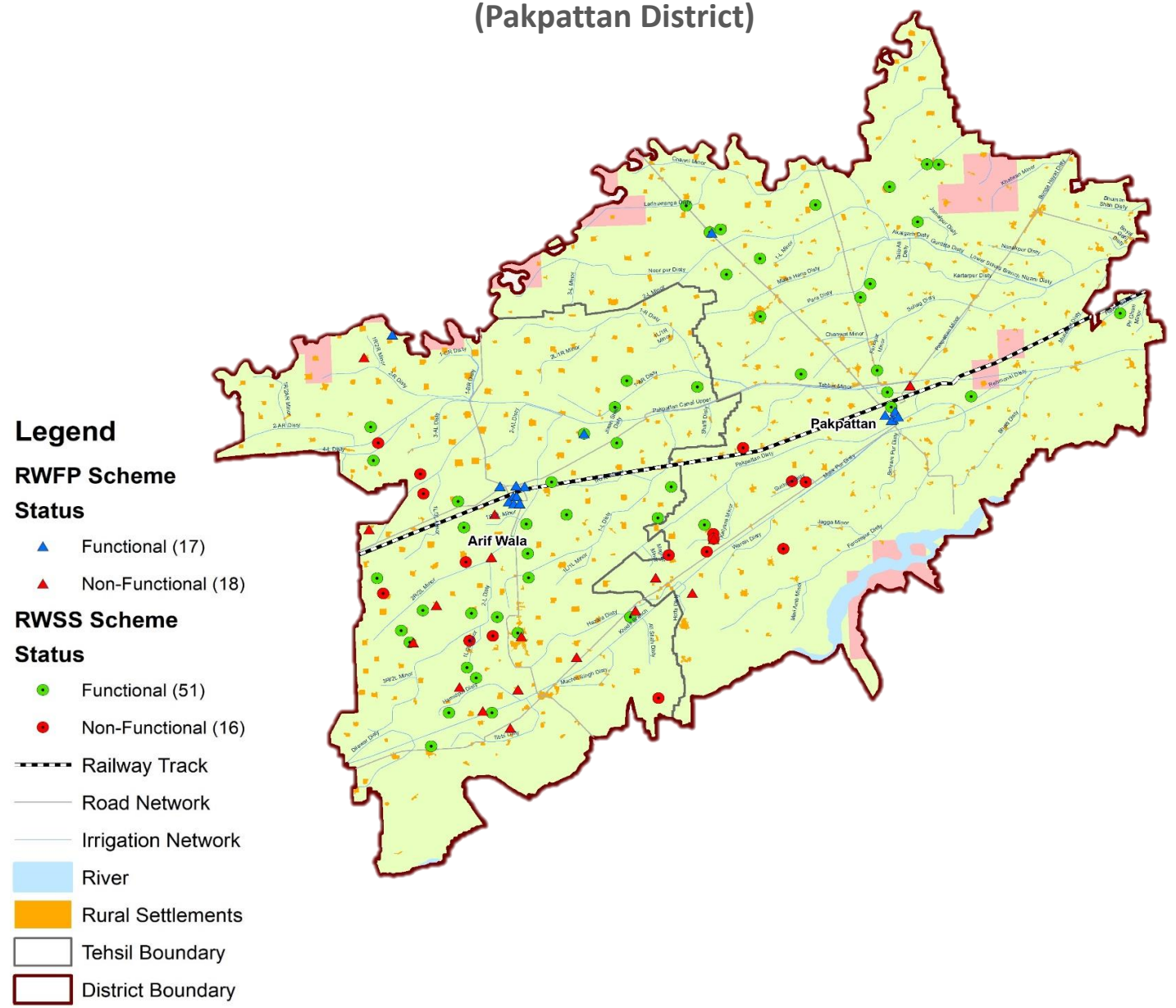
- ✓ **43% - Schemes < 10 years old (15 Nos)**
- ✓ **57% - Schemes 10 - 25 years old (20 Nos)**
- ✓ **0% - Schemes 25 - 40 years old (0 Nos)**





Baseline Map of Rural Water Supply Infrastructure

(Pakpattan District)



Pakpattan District – Site Assessment of Water Supply Infrastructure

Total of **4 Rural Water Supply Schemes** were visited and assessed in Pakpattan District

- ✓ RWWS Chak 19/SP in Pakpattan
- ✓ RWWS Chak 20/SP in Pakpattan
- ✓ RWWS Chak 59/EB in Arifwala
- ✓ RWWS Chak Shafee in Arifwala

Key Issues

- ❑ Major observed issue was the late/non-payment of **WAPDA dues** due to **Low Bill Collection** as most rural communities are unable to pay for hefty bills charged under **Commercial Tariff** for TWs by WAPDA
- ❑ Lack of **experienced/technical** persons for **Repairing/ Maintenance** in case of faults has led to damaged machinery & electrical systems in most schemes.

Proposed Solution

- ❑ Provision of **Renewable/Solar-based** Interventions for financial sustainability of schemes
- ❑ **Technical Capacity Building** of community for effective operation and maintenance of rural schemes
- ❑ **Operationalization** of dysfunctional schemes for immediate relief to communities in need based areas

Installed in 2000, the TW in Chak 19/SP is still functional but at the verge of its design life as evident from the picture above

Community consultation session in Chak Shafee indicated lack of technical person for the repair/maintenance of machinery

A Filtration Plant installed by Punjab Ab e Pak Authority in Chak Shafee of Pakpattan Tehsil

An abandoned Rural Water Supply Scheme and Filtration Plant in Chak 59/EB of Arifwala Tehsil

Pakpattan District – Rural Water Supply Projects

Sr.	Phase	Proposed Schemes, Estimated Cost & Scope
1	Short Term (2025)	**Pakpattan Rural Water Supply Uplift Project - Phase I (49 M)** **Scope of Project** ❑ Technical Capacity Building of Community for effective Operation & Maintenance of Schemes (2 M) ❑ Rehabilitation of 18 Nos Rural Filtration Plants in Pakpattan District (47 M)
2	Medium Term (2028)	**Pakpattan Rural Water Supply Uplift Project - Phase II (64 M)** **Scope of Project** ❑ Rehabilitation of 11 Nos Rural Water Supply Schemes in Pakpattan District (64 M)
3	Long Term (2033)	**Pakpattan Water Supply Uplift Project - Phase III (619 M)** **Scope of Project** ❑ Solarization of 35 Nos Rural Filtration Plants in Pakpattan District (21 M) ❑ Solarization of 62 Nos Rural Water Supply Schemes in Pakpattan District (598 M)
		Rural Water Supply Projects – Pakpattan District: 732 Million

Pakpattan District – Rural Water Supply Interventions Map

Technical Capacity Building for effective Operation & Maintenance of Rural Water Supply Schemes

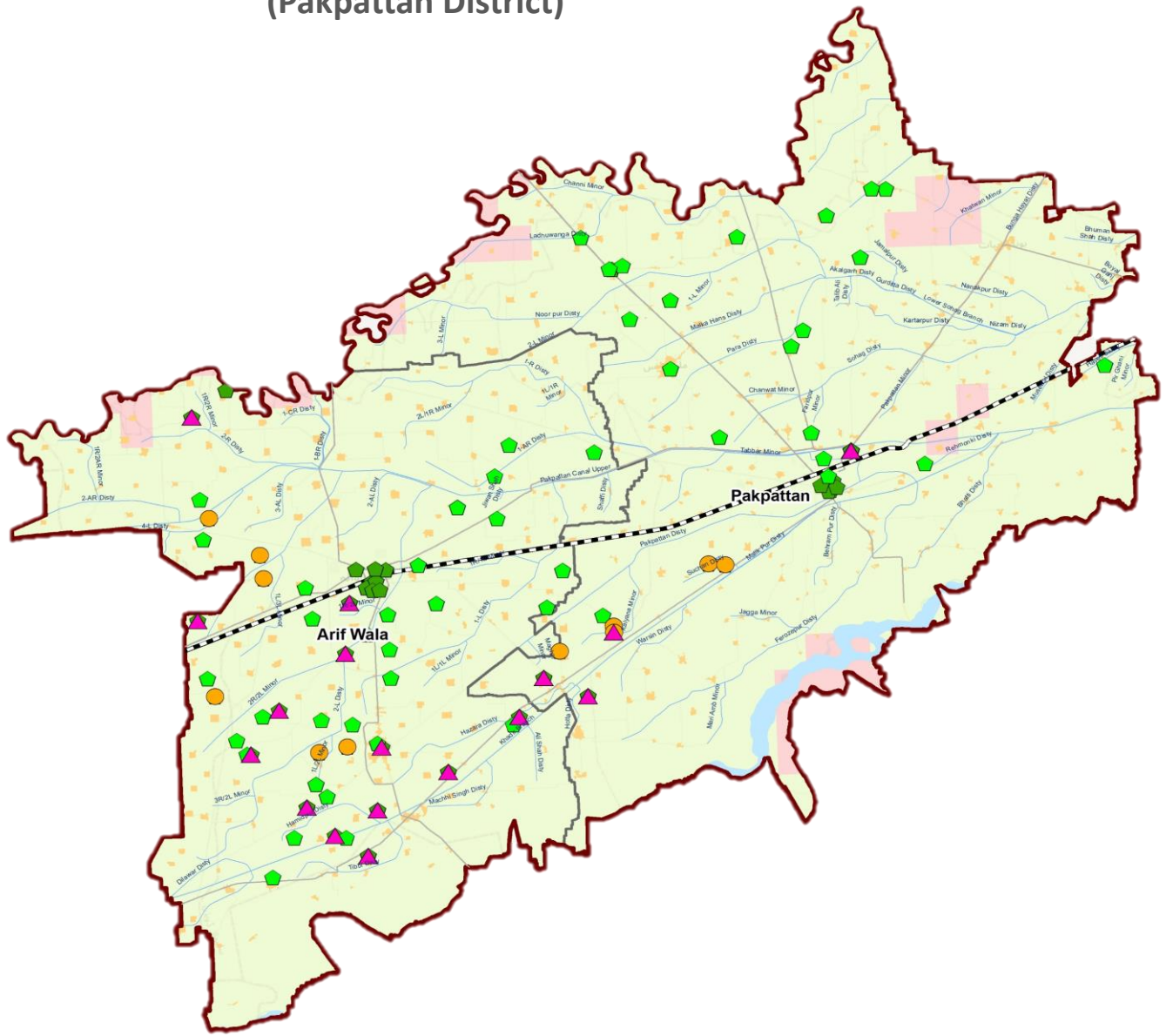
Rehabilitation of 18 Nos Dysfunctional Rural Filtration Plants proposed in **Short Term**

Rehabilitation of 11 Nos Dysfunctional Rural Water Supply Schemes proposed in **Medium Term**

Renewable Energy /Solarization of rural water supply schemes proposed in **Long Term**

Renewable Energy /Solarization of rural filtration plant schemes proposed in **Long Term**

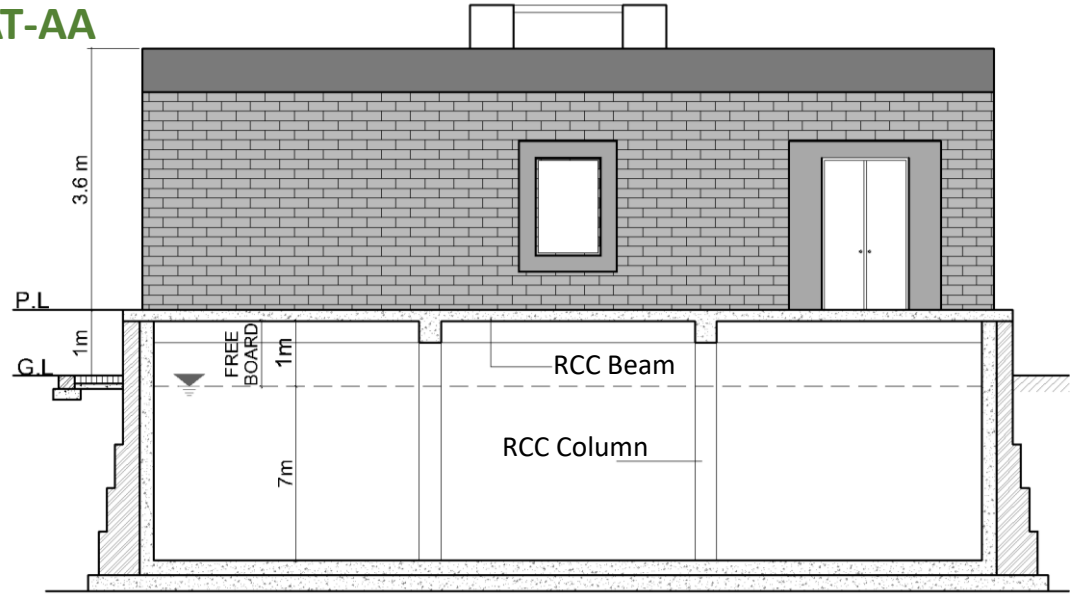
Interventions Map of Rural Water Supply Infrastructure
(Pakpattan District)



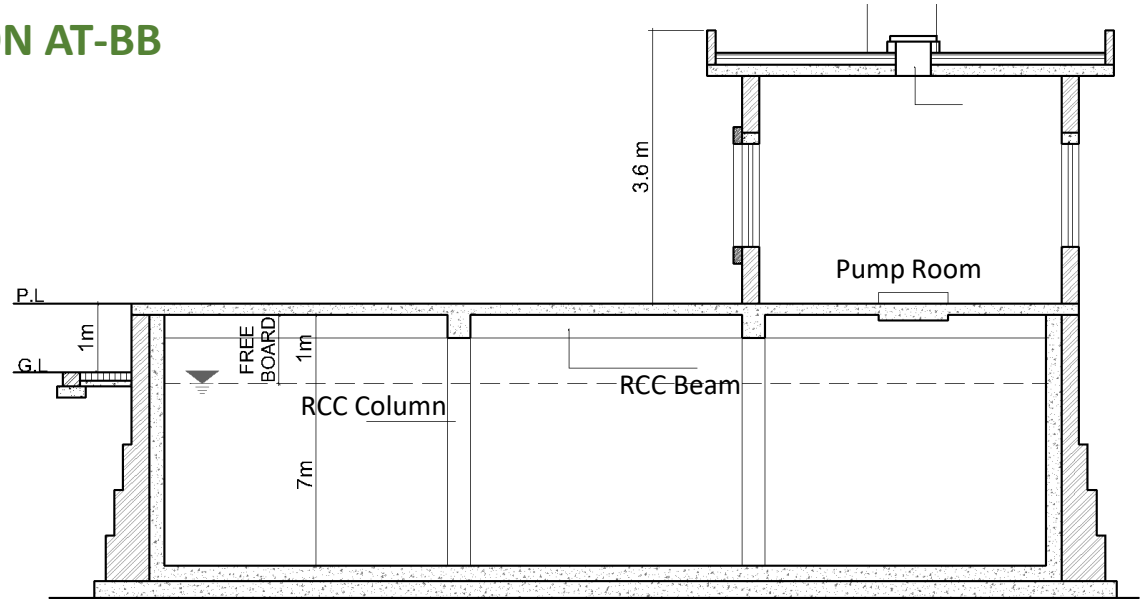
SAHIWAL REGIONAL DEVELOPMENT PLAN

CONCEPTUAL DESIGN FOR GROUND STORAGE TANK

SECTION AT-AA

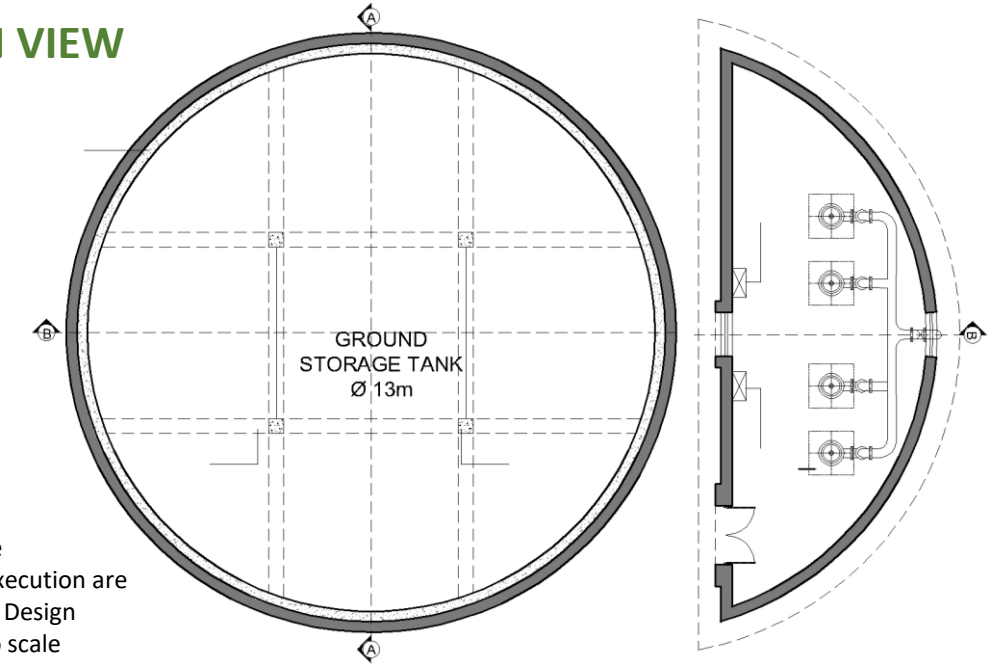


SECTION AT-BB



CONCEPTUAL 3D PERSPECTIVE VIEW

2D-PLAN VIEW



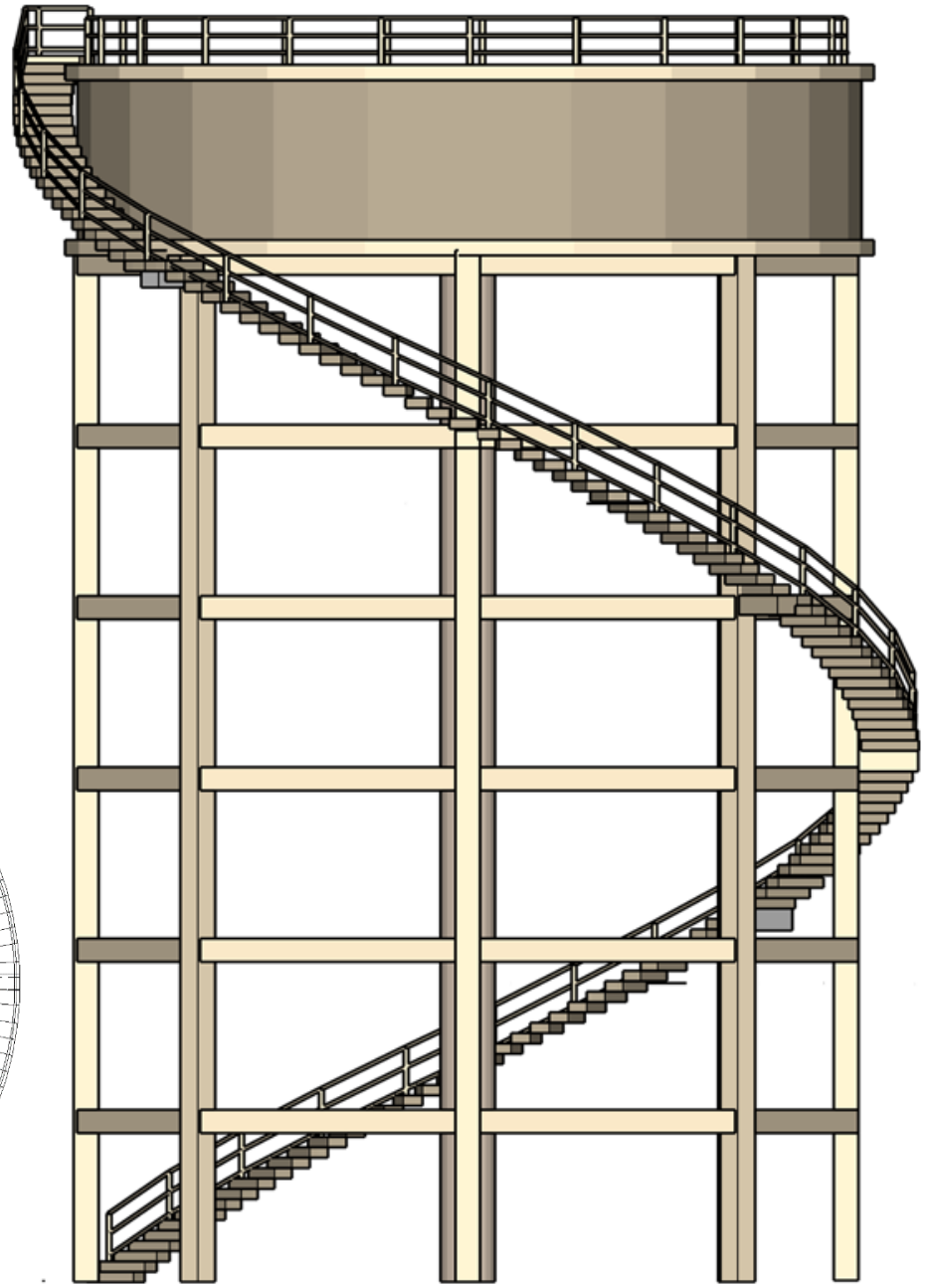
Note:
1-Sample Not to scale
2-Construction and Execution are subjected to Detailed Design
3-Drawings are not to scale

SAHIWAL REGIONAL DEVELOPMENT PLAN

CONCEPTUAL DESIGN FOR OVER HEAD WATER RESERVIOR

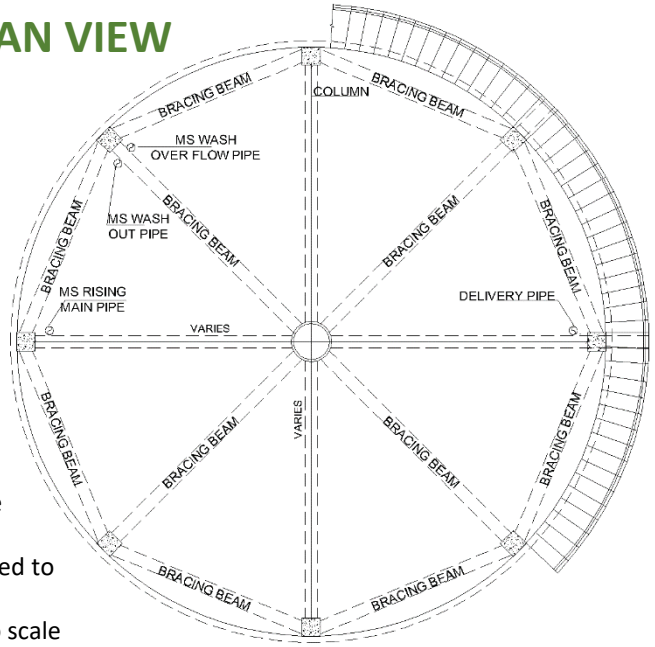
OVER HEAD WATER RESERVOIR					
Sr. No	**Capacity (Gallons)**	**Height (m)**	**Diameter (m)**	**Height(m) from Base to ground**	**Number of stories**
1	50,000	3.65	10	20	6
2	100,000	3.65	13.5	20	6
3	150,000	3.65	16.6	22	6

FRONT ELEVATION



CONCEPTUAL 3D DESIGN

2D-PLAN VIEW

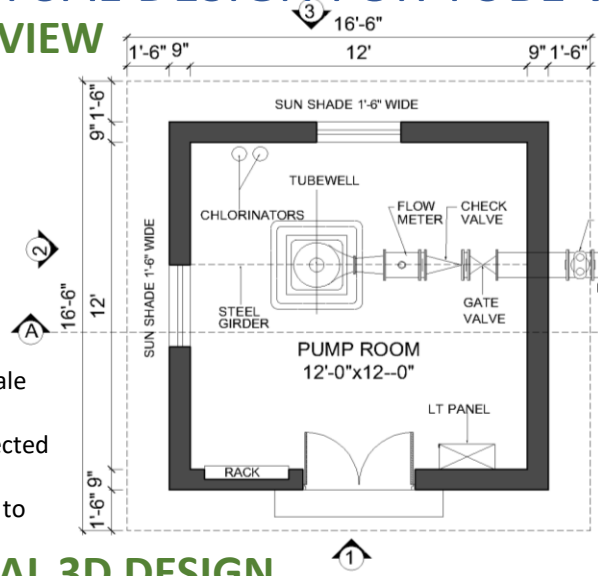


Note:
1-Sample Not to scale
2-Construction and Execution are subjected to Detailed Design
3-Drawings are not to scale

SAHIWAL REGIONAL DEVELOPMENT PLAN

CONCEPTUAL DESIGN FOR TUBE WELL

2D-PLAN VIEW



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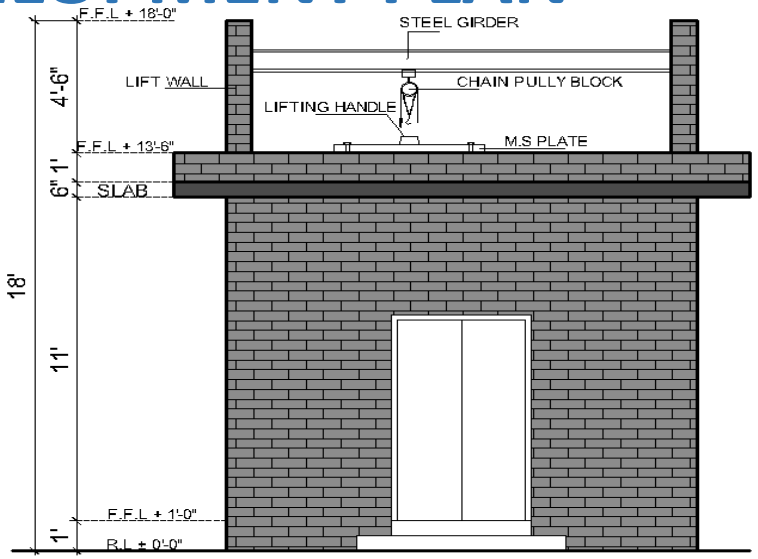
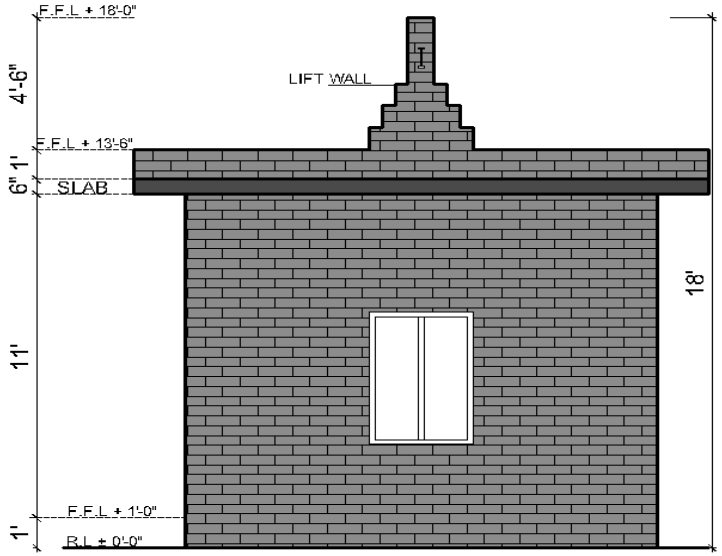
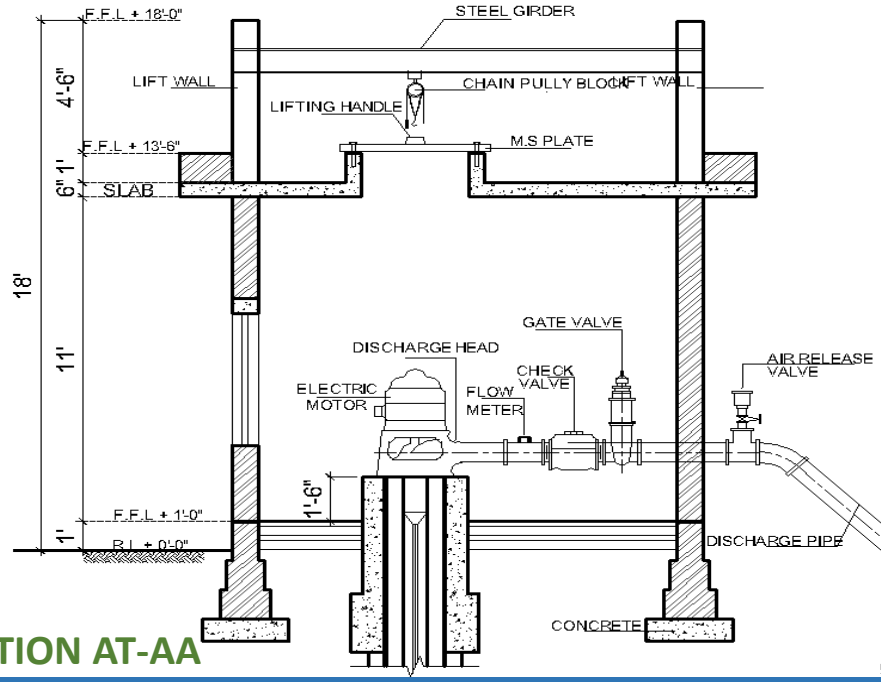
CONCEPTUAL 3D DESIGN



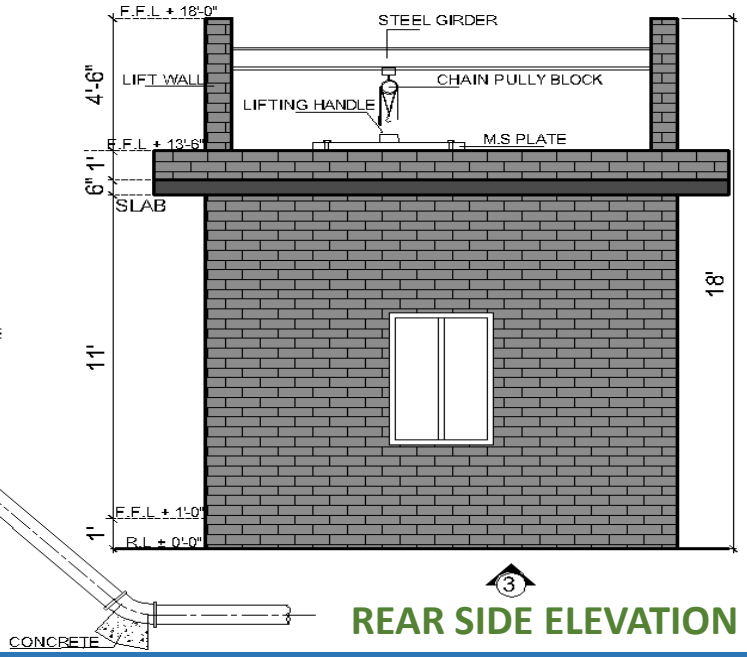
FRONT ELEVATION ①



LEFT SIDE ELEVATION ②



SECTION AT-AA



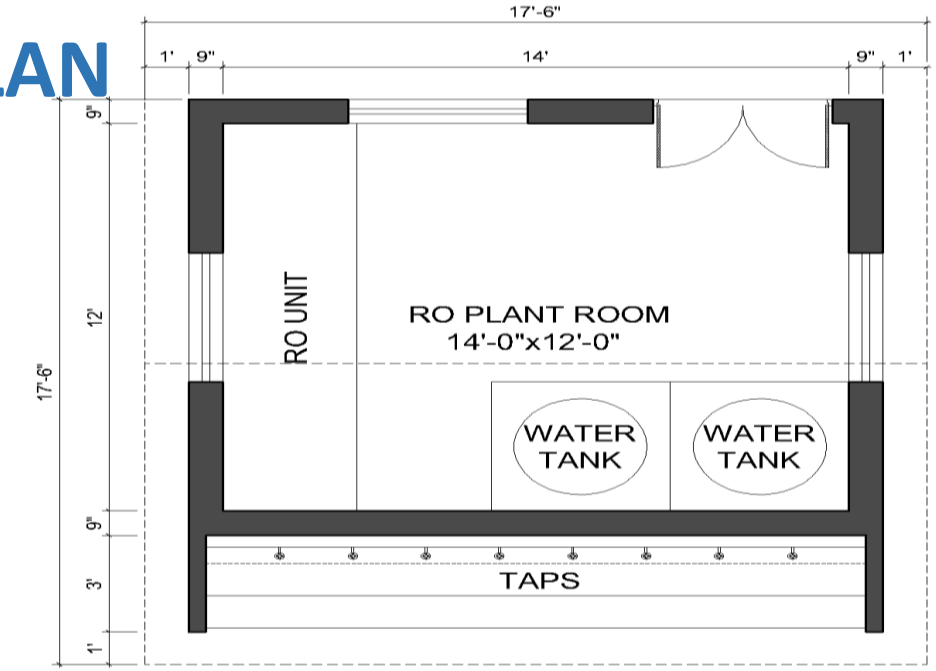
REAR SIDE ELEVATION ③

SAHIWAL REGIONAL DEVELOPMENT PLAN

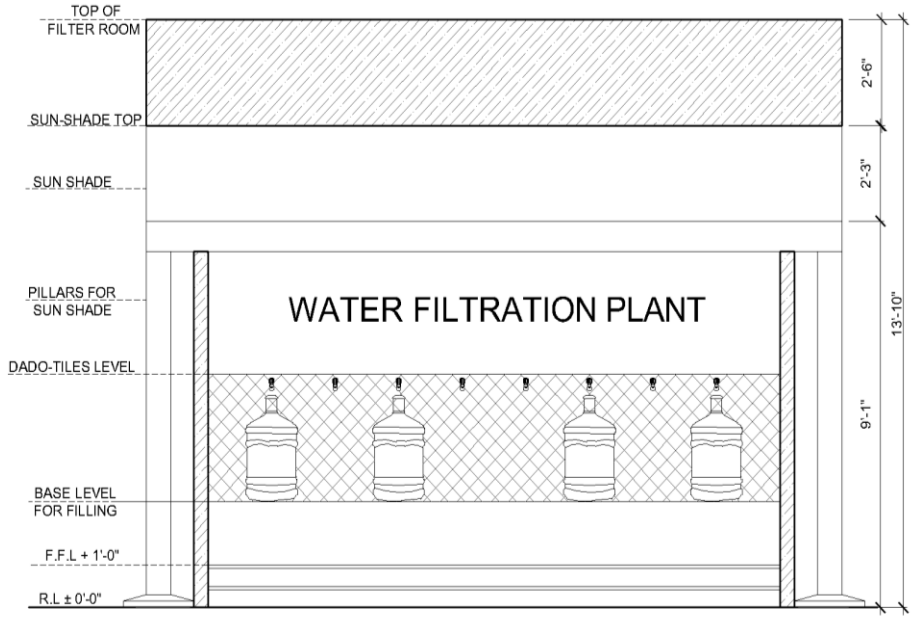
CONCEPTUAL DESIGN FOR FILTER PLANT

CONCEPTUAL 3D PERSPECTIVE VIEW

2D-PLAN VIEW



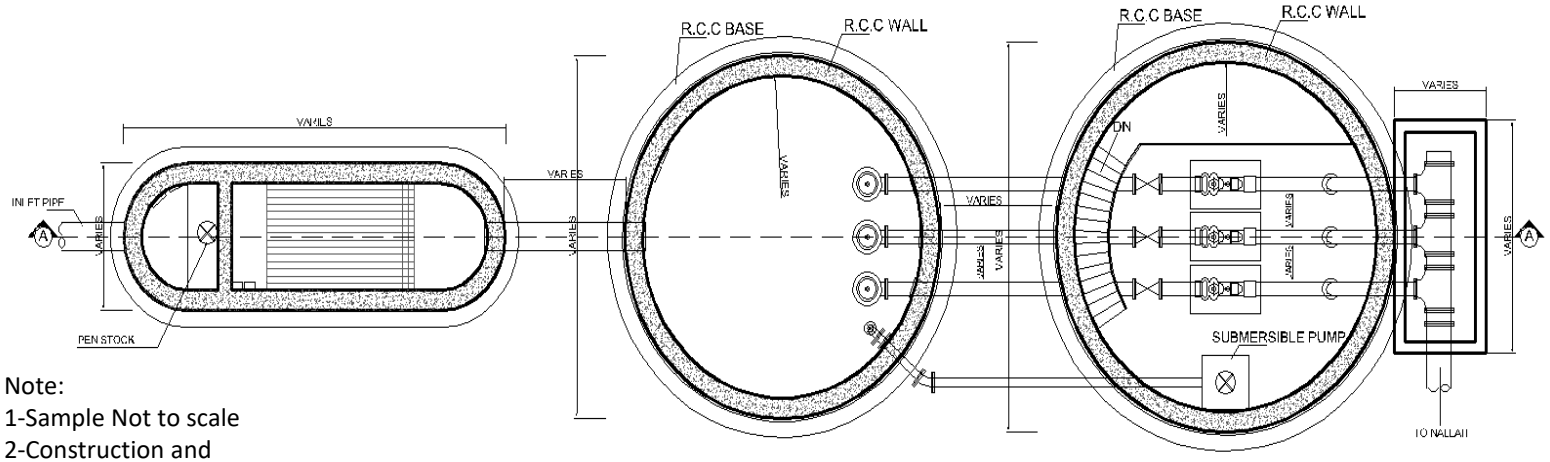
FRONT ELEVATION



SAHIWAL REGIONAL DEVELOPMENT PLAN

CONCEPTUAL DESIGN FOR DISPOSAL STATION

2D-PLAN VIEW



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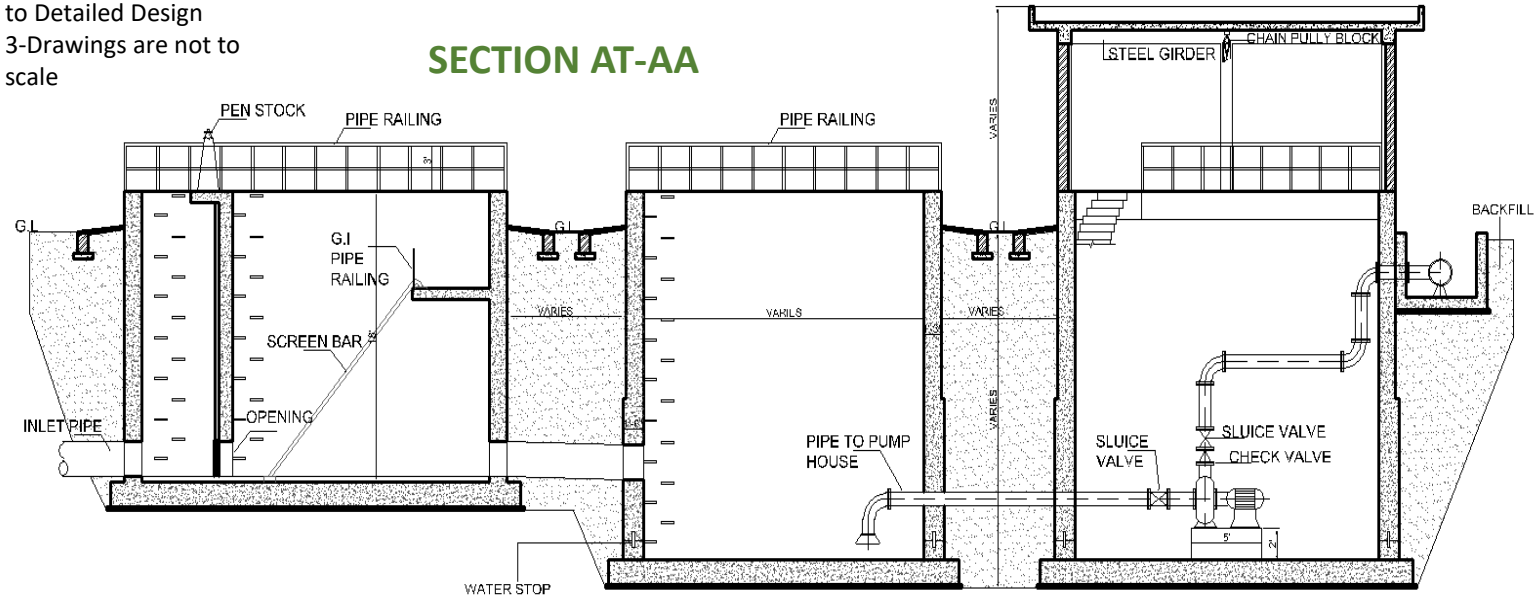
SECTION AT-AA

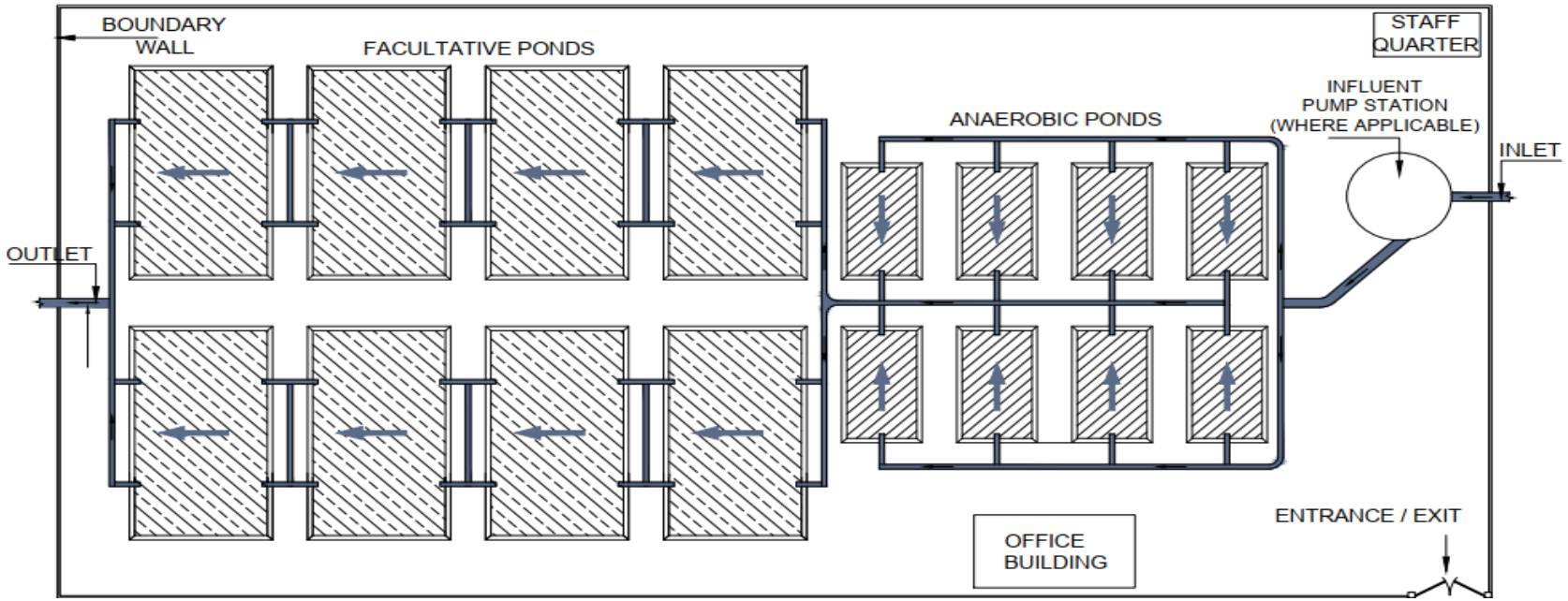


CONCEPTUAL 3D DESIGN

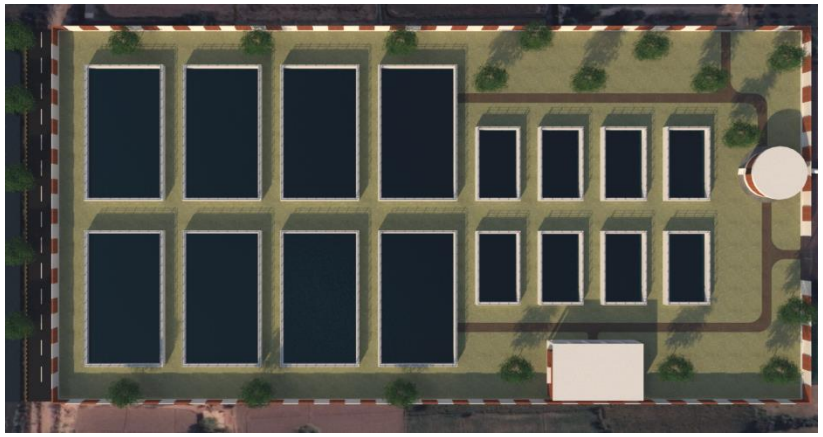
SAHIWAL REGIONAL DEVELOPMENT PLAN

CONCEPTUAL DESIGN FOR WASTE WATER TREATMENT PLANT

2D-PLAN VIEW



CONCEPTUAL 3D DESIGN



DETAILS OF CAPACITY AND AREA

Waste Water Treatment Plant			
Sr	**City**	**Capacity**	**Area**
1	Pakpattan	10 MGD	35 Acres
		10 MGD	35 Acres
		10 MGD	35 Acres
2	Okara	12 MGD	51 Acres
		8 MGD	37 Acres
3	Sahiwal	22 MGD	150 Acres

FACULTATIVE PONDS

ANAEROBIC PONDS

OFFICE BUILDING

STAFF QUARTER

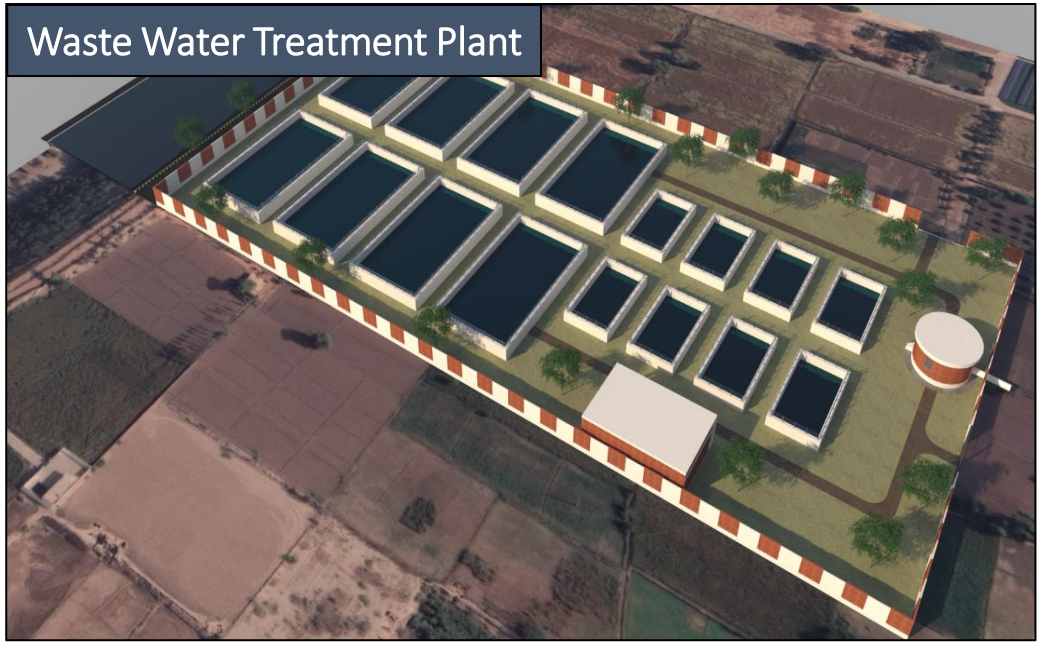
Conceptual Designs for WSS Infrastructure (3D View) – Sahiwal Regional Development Plan

Tube Well

Overhead Reservoir

Solar Based Filtration Plant

Waste Water Treatment Plant



Disposal Station

Urban and Rural Proposed Interventions – Total Cost

Regions	Sahiwal City	Okara City	Pakpattan City
Water Supply & Sanitation (Urban)	6477	8222	3743
Water Supply & Sanitation (Urban) Total	18442		
	Sahiwal District	**Okara District**	**Pakpattan District**
Water Supply & Sanitation (Rural)	3567	2135	732
Water Supply & Sanitation (Rural) Total	6434		
Total 24876 Million PKR			

THANK YOU