



**Program Management Unit (PMU)
Municipal Services Delivery Program (MSDP)
P&D Department, Government of Sindh**

**A&E Services for Jacobabad Water, Wastewater, and
Solid Waste Infrastructure**

CONTRACT PACKAGE EM-11

Procurement and Installation of E&M Works

BIDDING DOCUMENTS

VOLUME - IV

ENVIRONMENTAL DOCUMENTATION FORM

May – 2016

Issued to: _____

Dated: _____

Funded by:  USAID FROM THE AMERICAN PEOPLE	Joint Venture:  PLANNERS AND CONSULTING ENGINEERS	In Association With:  Techno-Consult International
---	---	--

A Revision Record

Revision	Description	Date

Organization of Report

- Environmental Documentation Form
- Environmental Review Report (ERR)
- Photographic Representation
- Description of Activities
- Environmental Management and Monitoring Plan(EMMP)

List of Abbreviations

AAA	AA Associates
ADB	Asian Development Bank
CC	Cement Concrete
CFR	Codes of Federal Regulations
DWT	Deep Well Turbine
EDF	Environment Documentation Form
EMMP	Environmental Mitigation & Monitoring Plan
EMS	Environmental Management System
ERR	Environmental Review Report
FGD	Focused Group Discussions
GOS	Government of Sindh
GOP	Government of Pakistan
HDPE	High Density Polyethylene
Km	Kilometer
kVA	Kilo Volt Ampere
MGD	Million Gallons per Day
mm	Millimeter
MS	Mild Steel
MSP	Municipal Services Program
NSUSC	North Sindh Urban Services Corporation
OH	Overhead
PHED	Public Health Engineering Department
PM10	Particulate Matter (less than 10 micron)
PMU	Program Monitoring Unit
ROW	Right of Way
SCADA	Supervisory Control and Data Acquisition
SEPCO	Sukkur Electric Power Company
TCI	Techno Consult International
TMA	Town Municipal Administration
UN	United Nations
USAID	United State Agency for International Development
USD	United State Dollar
USG	United State Government
WAPDA	Water & Power Development Authority
WFP	Water Filtration Plant
WHO	World Health Organization
WSS	Water Supply System



Environmental Documentation Form

Environmental Review Report (ERR) for Enhancement & Improvement of Water Supply System in Jacobabad.

A. Applicant Information

Contractor/Grantee	AAA-TCI-EMS	Parent Grant or Project	Contract No. IQC 391-I-11-00003 Task Order No. AID-391-TO-12-00007
Individual contact and Title	Dr. M. Bashir Lakhani, Chief of Party	Address, phone and email (if available)	47-E/2, Block-6, PECHS, Karachi. 0300-8212044 bashirlakhani@yahoo.com
Activity (brief description)	<p><u>Rehabilitation, improvement and up-gradation of Jacobabad Water Supply Infrastructure System</u></p> <p>The United States Government (USG) through the United States Agency for International Development (USAID) is committed to address the needs of the Municipal Service Delivery in impoverished areas of Sindh. The USAID is assisting Government of Sindh in establishment and improvement of municipal services in Jacobabad by funding essential infrastructure for water supply, wastewater and solid waste management in eight (08) Union Councils of the District. This Environmental Documentation Form (EDF) covers the environmental compliance requirements for rehabilitation, improvement and up-gradation of water supply infrastructure in Jacobabad which consists of following main interventions</p> <p>Component-1: Rehabilitation and Improvement of Raw Water Supply Source at Kirthar Canal</p> <p>Component-2: Construction of a New Water Pool for Increased Water Storage</p> <p>Component-3: Up gradation and Improvement of Existing High Pressure</p>	Amount	Rs. 1992 Million

	Pumping System including Electro-Mechanical Works Component-4* : Rehabilitation, Up-gradation and expansion of Existing Water Filtration Plant (WFP) Component -5 : Construction of a High Pressure Transmission Water Pipeline Component-6 : Rehabilitation of Zone Wise Water Distribution System & Construction of Overhead Water Tanks		
Location of activity	City of Jacobabad, Sindh	Start and end date of activity	April 2013 to February 2015

*** A detailed environmental assessment will be carried out for this activity as per the recommendations of Initial Environmental Examination (IEE). Therefore, this activity is not covered in this EDF.**

B. Activity, Screening Results and Recommended Determinations

Proposed Sub-activities	Screening Results			Recommended Determinations		
	Very Low Risk	Moderate Risk	High Risk	No significant adverse impact	With specified mitigation, no significant adverse impact	Significant Adverse impact
Component-1: Improvement & Enhancement of Water Intake from Kirthar Canal						
A. Design and Planning Phase						
Availability of increased quantity of water supply as per design demand at Kirthar Canal		✓			✓	
Consideration for loss of vegetation	✓			✓		
Topographical survey of the area	✓			✓		
Monitoring of characteristics of available water source (Kirthar Canal)	✓			✓		
B. Construction and Procurement Phase¹						
Procurement of 800 mm dia carbon steel pipe and its accessories for water supply from Kirthar Canal to Water Storage Pool #3	✓			✓		
Procurement and installation of 200 kVA (400 V – 3 Phase)diesel generator for low lift pumping station	✓			✓		

¹ All the procurement of equipment will be done in accordance with ADS 312 – Eligibility of Commodities and the approved IEE OAPA-13-SEP-PAK-0023. In addition the contract documents will stipulate that the generators to be procured shall meet USEPA Tier 4 emission standards.

Proposed Sub-activities	Screening Results			Recommended Determinations		
	Very Low Risk	Moderate Risk	High Risk	No significant adverse impact	With specified mitigation, no significant adverse impact	Significant Adverse impact
Procurement of glycerin-filled Pressure Gauge at the discharge lines of each pump at low lift pumping station	✓			✓		
Establishment of Campsite and Machinery/ Equipment Yard		✓			✓	
Minor maintenance works of six pumps already installed at low lift pumping station ²	✓			✓		
Excavation and laying of 800 mm dia carbon steel pipe at a length of 300 m for water supply from Kirthar Canal to Water Storage Pool #3		✓			✓	
Loss of vegetation due to site clearance	✓			✓		
Construction of generator building at low lift pumping station	✓			✓		
Desilting and removal of vegetation from existing water storage pool #1 & 2.		✓			✓	
C. Operation& maintenance Phase						
Monitoring of water quantity supplied from the source (Kirthar Canal).		✓			✓	
Monitoring of water pollution at the source (Kirthar Canal).		✓			✓	

² No disposal of electro-mechanical equipment is envisaged under the project.

Proposed Sub-activities	Screening Results			Recommended Determinations		
	Very Low Risk	Moderate Risk	High Risk	No significant adverse impact	With specified mitigation, no significant adverse impact	Significant Adverse impact
Air pollution of diesel generator installed at low lift pumping station		✓			✓	
Noise pollution due to pumps and diesel generator at low lift pumping station		✓			✓	
Fire hazard at pump room and diesel generator building at low lift pumping station		✓			✓	
Health and safety issues due to operation and maintenance activity at low lift pumping station		✓			✓	
Waste generation due to operation and maintenance activity at low lift pumping station	✓			✓		
Removal of vegetation and desilting from water storage pool #1&2.		✓			✓	
Component-2: Construction of New Water Pool						
A. Design and Planning Phase						
Land acquisition for 3 rd canal water storage pool ³	✓			✓		
Topographical survey of the area	✓			✓		

³ USAID is not financing any land acquisition nor is any land acquisition required for the project since all of the construction works are being carried out on government owned land.

Proposed Sub-activities	Screening Results			Recommended Determinations		
	Very Low Risk	Moderate Risk	High Risk	No significant adverse impact	With specified mitigation, no significant adverse impact	Significant Adverse impact
Consideration for loss of vegetation	✓			✓		
B. Construction and Procurement Phase						
Loss of vegetation due to site clearance	✓			✓		
Excavation works for Water Storage Pool #3.		✓			✓	
Embankment works for Water Storage Pool #3.	✓			✓		
C. Operation and Maintenance Phase						
Removal of vegetation and desilting from water storage pool #3.		✓			✓	
Component-3: Pumping Capacity Enhancement						
A. Design and Planning Phase						
Design works for rehabilitation and up-gradation of high lift pumping stations.	✓			✓		
Condition assessment of Vertical Deep Well Turbine (DWT) Pumps at High Lift Pumping Station.	✓			✓		
Design of new water distribution main from high lift pumping station to water filtration plant and its alignment.		✓			✓	

Proposed Sub-activities	Screening Results			Recommended Determinations		
	Very Low Risk	Moderate Risk	High Risk	No significant adverse impact	With specified mitigation, no significant adverse impact	Significant Adverse impact
Land acquisition for Right of Way (ROW) of new rising main ⁴	✓			✓		
Probability of electricity failure		✓			✓	
Selection of Genset as per the required load		✓			✓	
B. Construction and Procurement Phase⁵						
Procurement and installation of 900 kVA (400 V – 3 Phase)diesel generator for high lift pumping station	✓			✓		
Procurement of flow meter for 600 mm rising main	✓			✓		
Procurement of 600 mm dia carbon steel rising main and its accessories	✓			✓		
Establishment of Campsite and Machinery/ Equipment Yard		✓			✓	
Excavation works for 600 mm dia carbon steel rising main		✓			✓	
Laying of 20.75 km long 600 mm dia carbon steel rising main.		✓			✓	

⁴ No Right of Way needs to be established for project components as pipe laying will be carried out on public roads for which the Government has already issued NOC. (See Annexure III)

⁵ All the procurement of equipment will be done in accordance with ADS 312 – Eligibility of Commodities and the approved IEE OAPA-13-SEP-PAK-0023. In addition the contract documents will stipulate that the generators to be procured shall meet USEPA Tier 4 emission standards.

Proposed Sub-activities	Screening Results			Recommended Determinations		
	Very Low Risk	Moderate Risk	High Risk	No significant adverse impact	With specified mitigation, no significant adverse impact	Significant Adverse impact
Minor repair works at high lift pumping station “pump room, underground water tank and generator room”. ⁶	✓			✓		
Minor maintenance works of seven pumps already installed at high lift pumping station ⁷	✓			✓		
After minor maintenance works shifting and re-installation of the six DWT pumping sets from water filtration plant to high lift pumping station ⁸	✓			✓		
Repairing of available 300 kVA standby diesel generator set at high lift pumping station and shifting of this generator to water filtration plant. ⁹	✓			✓		
C. Operation and Maintenance Phase						
Monitoring of water quantity supplied from high lift pumping station.		✓			✓	

⁶ No disposal of electro-mechanical equipment is envisaged under the project.

⁷ Ibid.

⁸ Ibid.

⁹ Ibid.

Proposed Sub-activities	Screening Results			Recommended Determinations		
	Very Low Risk	Moderate Risk	High Risk	No significant adverse impact	With specified mitigation, no significant adverse impact	Significant Adverse impact
Air pollution of diesel generator installed at high lift pumping station		✓			✓	
Noise pollution due to pumps and diesel generator at high lift pumping station		✓			✓	
Fire hazard at pump room and diesel generator building at high lift pumping station		✓			✓	
Health and safety issues due to operation and maintenance activity at high lift pumping station		✓			✓	
Waste generation due to operation and maintenance activity at high lift pumping station	✓			✓		
Maintenance of air release valves in rising mains		✓			✓	
Illegal water connections in rising mains		✓			✓	
Component-5: Pumping & Transmission System Loop to Overhead Water Tanks						
A. Design and Planning Phase						
Land acquisition for pipeline ROW and for construction of new OH water tanks ¹⁰	✓			✓		

¹⁰ See Footnotes number 1 and 2 above.

Proposed Sub-activities	Screening Results			Recommended Determinations		
	Very Low Risk	Moderate Risk	High Risk	No significant adverse impact	With specified mitigation, no significant adverse impact	Significant Adverse impact
Design of new Rising Main (Carbon Steel) 600 mm dia from water filtration plant to overhead tanks		✓			✓	
Requirement of new Vertical Deep Well Turbine (DWT) Pumps	✓			✓		
Probability of electricity failure		✓			✓	
Topographical survey of the area	✓			✓		
Design of new GeneratorRoomBuilding	✓			✓		
Selection of Genset as per the required load		✓			✓	
Public consultation and sharing of proposed design considerations		✓			✓	
B. Construction and Procurement Phase¹¹						
Procurement of new Rising Main (Carbon Steel) 600 mm dia from water filtration plant to all six overhead tanks.	✓			✓		
Procurement of flow meter for new Rising Main (Carbon Steel) 600 mm dia.	✓			✓		
Procurement of flow meter for 600 mm Carbon Steel distribution	✓			✓		

¹¹All the procurement of equipment will be done in accordance with ADS 312 – Eligibility of Commodities and the approved IEE OAPA-13-SEP-PAK-0023. In addition the contract documents will stipulate that the generators to be procured shall meet USEPA Tier 4 emission standards.

Proposed Sub-activities	Screening Results			Recommended Determinations		
	Very Low Risk	Moderate Risk	High Risk	No significant adverse impact	With specified mitigation, no significant adverse impact	Significant Adverse impact
line of all six Overhead Water Tanks						
Procurement and Installation of 12 new DWT Pumps having capacity of 243 m ³ /hr	✓			✓		
Establishment of Campsite and Machinery/ Equipment Yard		✓			✓	
Deep excavation works of approx 2 m to 3 m for new Rising Main (Carbon Steel) 600 mm dia from water filtration plant to overhead tanks		✓			✓	
Laying of 6.7 km long new Rising Main (Carbon Steel) 600 mm dia from water filtration plant to overhead tanks		✓			✓	
Construction of generator building	✓			✓		
C. Operation and MaintenancePhase						
Monitoring of water quantity and quality supplied from water filtration plant pumping station.		✓			✓	
Air pollution of diesel generator installed at water filtration plant.		✓			✓	
Noise pollution due to pumps and diesel generator at water filtration plant.		✓			✓	
Fire hazard at pump room and diesel generator building at water filtration plant.		✓			✓	

Proposed Sub-activities	Screening Results			Recommended Determinations		
	Very Low Risk	Moderate Risk	High Risk	No significant adverse impact	With specified mitigation, no significant adverse impact	Significant Adverse impact
Health and safety issues due to operation and maintenance activity of pumps and diesel generator installed at water filtration plant.		✓			✓	
Waste generation due to operation and maintenance activity.	✓			✓		
Illegal water connections in new rising main and distribution pipe to all six Overhead Water Tanks		✓			✓	
Component-6: Zone Wise Water Distribution System & Construction of Overhead Water Tanks						
A. Design and Planning Phase						
Topographical survey of the area	✓			✓		
Design considerations for disruption of existing water supply services		✓			✓	
Design considerations to prevent the risk of contamination of sewage into water supply		✓			✓	
Design considerations for meeting the daily demand of water supply		✓			✓	
Probability of electricity failure		✓			✓	
Design considerations for traffic congestion due laying of water distribution network		✓			✓	

Proposed Sub-activities	Screening Results			Recommended Determinations		
	Very Low Risk	Moderate Risk	High Risk	No significant adverse impact	With specified mitigation, no significant adverse impact	Significant Adverse impact
Public consultation and sharing of proposed design considerations		✓			✓	
B. Construction and Procurement Phase¹²						
Procurement of 350 mm HDPE pipe from all six Overhead Water Tanks to distribution network	✓			✓		
Procurement of 350 mm to 75 mm HDPE pipe for distribution network for zone1, zone2, zone3, zone4, zone5, and zone6.	✓			✓		
Establishment of Campsite and Machinery/ Equipment Yard		✓			✓	
Excavation works for 350 mm HDPE pipe from all six Overhead Water Tanks to distribution network and 350 mm to 75 mm HDPE pipe for distribution network for zone1, zone2, zone3, zone4, zone5, and zone6.		✓			✓	
Laying of 0.675 km long 350 mm dia HDPE pipe from all six Overhead Water Tanks to distribution network.		✓			✓	

¹²All the procurement of equipment will be done in accordance with ADS 312 – Eligibility of Commodities and the approved IEE OAPA-13-SEP-PAK-0023. In addition the contract documents will stipulate that the generators to be procured shall meet USEPA Tier 4 emission standards.

Proposed Sub-activities	Screening Results			Recommended Determinations																						
	Very Low Risk	Moderate Risk	High Risk	No significant adverse impact	With specified mitigation, no significant adverse impact	Significant Adverse impact																				
Laying of 350 mm to 75 mm dia HDPE pipe for distribution network for zone1, zone2, zone3, zone4, zone5, and zone6 as per following details: <table><tr><th>#</th><th>Diameter of Pipe (mm)</th><th>Length of Pipe (km)</th></tr><tr><td>1</td><td>300</td><td>7.65</td></tr><tr><td>2</td><td>250</td><td>7.15</td></tr><tr><td>3</td><td>200</td><td>4.8</td></tr><tr><td>4</td><td>150</td><td>14.5</td></tr><tr><td>5</td><td>100</td><td>20.4</td></tr><tr><td>6</td><td>75</td><td>65.1</td></tr></table>	#	Diameter of Pipe (mm)	Length of Pipe (km)	1	300	7.65	2	250	7.15	3	200	4.8	4	150	14.5	5	100	20.4	6	75	65.1		✓		✓	
#	Diameter of Pipe (mm)	Length of Pipe (km)																								
1	300	7.65																								
2	250	7.15																								
3	200	4.8																								
4	150	14.5																								
5	100	20.4																								
6	75	65.1																								
Construction of 25 m high water tank of 1,364 m ³ for zone1.		✓			✓																					
Construction of 25 m high water tank of 682 m ³ for zone2.		✓			✓																					
Construction of 20 m high water tank of 1,000 m ³ for zone3.		✓			✓																					
Construction of 20 m high water tank of 568 m ³ for zone4.		✓			✓																					

Proposed Sub-activities	Screening Results			Recommended Determinations		
	Very Low Risk	Moderate Risk	High Risk	No significant adverse impact	With specified mitigation, no significant adverse impact	Significant Adverse impact
Construction of 20 m high water tank of 750 m ³ for zone5.		✓			✓	
Construction of 20 m high water tank of 1,137 m ³ for zone6.		✓			✓	
C. Operation and MaintenancePhase						
Monitoring of water quantity supplied.		✓			✓	
Monitoring of water pollution at each water tank delivery and end users		✓			✓	
Illegal water connections		✓			✓	
Contamination of sewage in water supply		✓			✓	

Summary of Recommended Determinations (Check all that apply)

The activity contains. . .	(equivalent regulation 216 terminology)
<input type="checkbox"/> Very low risk sub-activities	categorical exclusion(s)
<input type="checkbox"/> After environmental review, sub-activities determined to have no significant adverse impacts	negative determination(s)
<input checked="" type="checkbox"/> After environmental review, sub-activities determined to have no significant adverse impacts, given appropriate mitigation and monitoring	negative determination(s) with conditions
<input type="checkbox"/> After environmental review, sub-activities determined to have significant adverse impacts	positive determination(s)

Environmental Review Report (ERR)

Name of Reviewer and Designation	Kashif Masud, Environmental Engineer
Date of Site Visit	November 12 – 14, 2012
Project Name	Water Supply System MSP, A&E Services for Jacobabad Water, Wastewater and Solid Waste Infrastructure
Location	Near Kirthar Canal District Jacobabad, Sindh, Pakistan
Project Start Date	April 2013
Project Completion Date	February 2015

A. BASELINE ENVIRONMENTAL CONDITIONS OF THE JACOBABAD CITY

The following description seeks to briefly outline the baseline environmental condition of the area where the water supply system improvement is proposed to be undertaken. The baseline has been taken into account while finalizing the design, with respect to the environmental and social receptors of the activities and any environmental impacts resulting thereof. This baseline is also intended to enable the decision making authority of this EDF reach an informed decision vis-à-vis environmental impacts and benefits of the proposed project.

EXISTING PHYSICAL ENVIRONMENT

1. Project Area

Jacobabad is the capital city of Jacobabad District, Sindh, Pakistan. Located at 28°16'37.32"N 68°27'05.04"E, the city is subdivided into 8 Union Councils (figure – 1 depicts 8 Union Councils and Their Administrative Boundaries with Jacobabad City) namely Soomrah Mohalla, Lashari Mohalla, Shah Gazi Mohalla, Drakhan Mohalla, Phool Bagh, Mochi Basti, Jaffarabad Mohalla, and Dastagir Colony. Total area covered by all union Councils is nearly 2530 acres i.e. 10.25 sq.km. Jacobabad City is a big Mandi (market) of Rice, situated on Sukkur Quetta National Highway. It is located 76 km away from Sukkur and 36 km from Shikarpur, and is connected with all Tehsil head quarters by metal roads as well as railroads. It is also connected with Tehsils of Balochistan Province. The estimated current population (year 2012) of the city has been taken at **275,000**. The population taken for design (year 2030) for water supply system at a growth rate of 3.18% is **483,117**.¹³ The boundaries of existing urban union councils are not likely to change and the population increase will be accommodated in the existing boundaries.

¹³ All the details and modalities for the finalization of the population are stipulated in "*Inception Report*".

2. Topography, Soil and Geology

Topography of the project area is predominantly flat with mild slope towards the south. The land consists of stretches of leveled or nearly leveled alluvial plains, scalloped inter fluvies formed by deposits of the Indus River. The soil contains varying proportions of clay and sand. New deposition is almost pure sand, which becomes stable through continuous deposition of silt and then becomes able to sustain agriculture and trees. The area is covered by the Quaternary deposits of extinct streams and older terrace deposits. Stream deposits are dominated by the streambed and meanderbelt deposits. While the old terrace deposits consists of loess and flood plain deposits of the middle terrace.¹⁴

3. Surface and Ground Water

Jacobabad is situated in tropical and most drought affected zone. Its lands are mostly irrigated with the network of non-perennial canals which form less alluvial deposits and recharge the potable aquifers very less. Consequently the ground water of whole district is brackish, un-hygienic and unfit for human consumption. There is no sweet water aquifer available in the region however; sweet water is present only near the surface water body (Kirthar Canal). The depth of groundwater table varies from 3 to 20 m.¹⁵

4. Seismic Condition

The seismic zoning map of Pakistan 2005, prepared by Pakistan Meteorological Department indicates that the project area lies in the zone 2A and has moderate seismic risk. The updated Seismic Zoning Map of Pakistan after 2005 earthquake is attached as figure – 2.

5. Climate, Air Quality and Noise

Jacobabad is said to be one of the hottest cities in Pakistan. The project area lies in a dry Subtropical Climate zone, characterized by hot summers and mild winters. The winter months are December, January and February. The temperature remains high during the months of June, July and August and sometimes reaches up to 50°C. The major air quality issue in the project area is particulate matter (PM10) due to presence of heavy dust, mostly generated due to dry atmosphere and aggravated due to human activities (e.g. vehicular movement etc).¹⁶ Ambient noise level around the project site ranges between 64-68 dB.¹⁷

¹⁴ IEE of ADB-Assisted Flood Emergency Reconstruction Project, Works and Service Department, Government of Sindh, November 2011

¹⁵ Ibid

¹⁶ Ibid

¹⁷ Ibid

6. Flora and Fauna

Flora of the project area falls in the scrub Dry Tropical Thorn Forest Zone. This is the natural vegetation of the Indus Basin. It has the capacity to survive and grow in areas with extremely high temperatures and low precipitation. The flora consists of spiny and hard wooded species. Acacia species are the dominant one. The main fruit grown in the project area is date; guava and grape fruits are also grown. Among vegetables turnips, radish, potatoes, onions, peas, spinach, carrot and lady finger are grown in the area.

At present jackal, squirrel, fox, rats and mongoose are found near the project area. Bats, especially of the genera chiropteran are also seen in the area. Domestic animals include goats, sheep, camel, cows and buffaloes. Another important domestic animal of the area is donkey, which is used for pulling carts, etc. Important bird species found in the project area are common crow, common mayna, house sparrow and common teal. Grey and black partridges, though present in the area but their population have been significantly reduced due to excessive hunting.¹⁸

7. Socio-economic Characteristics

Management Systems International (MSI) was engaged by USAID under the Monitoring and Evaluation Program for carrying out Evaluation Design & Baseline Study Implementation for the Municipal Service Program. Some of the socio-economic characteristics of the population, as presented in MSP Evaluation Design & Baseline Report, are summarized as follows:

About half (48 percent) of the households depend on a salaried job as their main source of income; only nine percent hold a private sector job, while 39 percent work for the government. Self-employment in a business is the main source of income for 20 percent of the households. Agricultural land, rented property, remittances and home-based enterprise are minor contributors¹⁹.

For 13 percent of the households, salaried employment is the second most important source of income, and for five percent self-employment is the second most important source.

Few of the households (11 percent) live in katcha houses; 59 percent live in pukka houses and 30 percent in semi-pukka. The average number of rooms in a house is three, excluding the kitchen and the toilet.

Reportedly, 12 percent of the households (about the same percentage as those living in katcha houses) have total household expenditure of less than Rs. 10,000 per month. Approximately three quarters of the households spend less than Rs. 30,000 per month, which translates into Rs. 109 (or 1.1 USD) per day for each household member, considering 9 members/household.

8. Health Profile

High rates of water-borne diseases and significant expenditures on the treatment of diseases are reported during Focused Group Discussion (FGDs) organized by MEP. Malaria and diarrhea were

¹⁸ Ibid

¹⁹ Municipal Services Program (MSP), Evaluation Design & Baseline Report, January 14, 2013.

reported to be the most common diseases, followed by Hepatitis A and E. It was reported that, “Malaria treatment costs Rs. 1,000 for each trip to see a doctor. It was also estimated that “the average cost incurred on Hepatitis C in a private hospital was around Rs. 100,000 to 150,000, whereas government hospitals charged 10,000 to 15,000.” Minority and low-income households reported that they could barely arrange food for their families when a large amount of the household’s budget was spent on healthcare²⁰.

9. Sanitation

Flush toilets are reported to be in use by 65 percent of the households and non-flush toilets by 34 percent, for a total of 99 percent reporting availability of toilets in the house.²¹ According to female respondents, adult females from the household are responsible for cleaning the toilets in 96 percent of the households. More adult women (98 percent) than men (95 percent) report washing their hands with soap after going to the toilet.

In the eight FGDs organized by MEP, no one reported open defecation as a practice in Jacobabad. However, there are some households that lack awareness; their children practiced open defecation in mohalla (male FGD, Family Line). Approximately equal proportions of men and women reported that they regularly cleaned their houses, washed toilets, took baths daily, washed hands after using the toilet, wore clean clothes and also washed hands before taking meals (6 FGDs). Only in one group men reported that a majority of children do not wash hands after using the latrines (Male FGD, Mohalla Dangar).

CURRENT CONDITIONS OF WATER SUPPLY

Background

The water supply system in Jacobabad city was established in early 1960s by the Public Health Engineering Department (PHED). After around four decades, the need for upgrading and improving the system was felt, and various improvement projects started in 2004/05. These projects mainly included the construction of intake works, pre-settlement water pools, filtration plant and a new distribution system. Most of these Water Supply Improvement Projects were completed by PHED in 2008. The transmission system was constructed with Mild Steel (MS) pipe while the distribution system comprised of ductile iron (DI) or galvanized iron (GI) pipes. However, in spite of these major improvement projects, the overall system is still lacking in many areas including infrastructure and institutional deficiencies.

Currently the water supply systems in Jacobabad need to be improved to ensure the service delivery. Problems reported at the intake works include damage to the embankments of the storage water pools due to erosion, damage to the banks of the Kirthar canal, damage to the civil works at the pump and generator rooms, structural and electrical problems with the high service pumps at the intake sump, and damage to gravity pipes connecting Canal to the water pools. The external coating of the 600 mm rising main from water pools to the filtration plant is damaged at several locations and the air valves on the same main are leaking and need to be rectified. Due to lack of technical and operational expertise, the filtration plant units are mostly non-operational including the alum dosing unit, clarifier system, sludge pump room, gas chlorination system, and the water quality laboratory adjacent to the plant. Also, there is no

²⁰ Municipal Services Program (MSP), Evaluation Design & Baseline Report, January 14, 2013.

²¹ Municipal Services Program (MSP), Evaluation Design & Baseline Report, January 14, 2013.

boundary wall and gates at the plant. A significant problem lies in the provision of electricity to operate the pumps and other units at the intake and plant due to excessive load shedding problems. Approximately there are 15,000 household connections from the water distribution system, however, none of the installed house connections meet the required design and installation specification leading to faulty and low quality connections that not only damaged the water lines but also increased the possibility of contamination of water lines. The house connections installed are of inferior quality providing possibility of mixing of wastewater from over-flowing drains with the water lines thus making the supplied water unhygienic and unfit for human consumption.

Existing System & related Issues

In spite of the major improvement projects, the overall system is still lacking in the following aspects:

- Supply of water as per demand of different zones of Jacobabad city. A comparison of the existing water supply and demand of different zones are given in below table:

Zone	Population	Current Water Supply	Current Water Demand
Zone 1-A	28,420	1.167 MGD	0.825 MGD
Zone 1-B	61,740		1.852 MGD
Zone 2	54,040	1.167 MGD	1.621 MGD
Zone 3	131,600	1.167 MGD	3.954 MGD

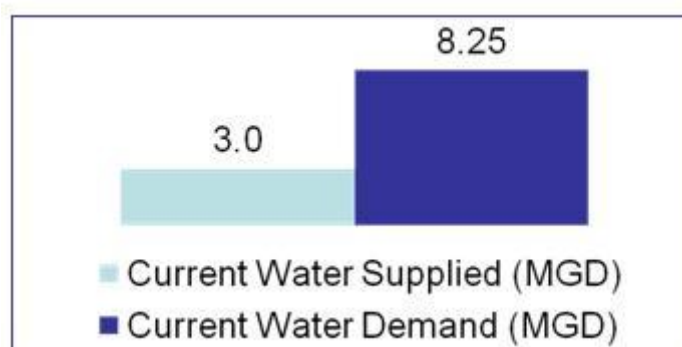
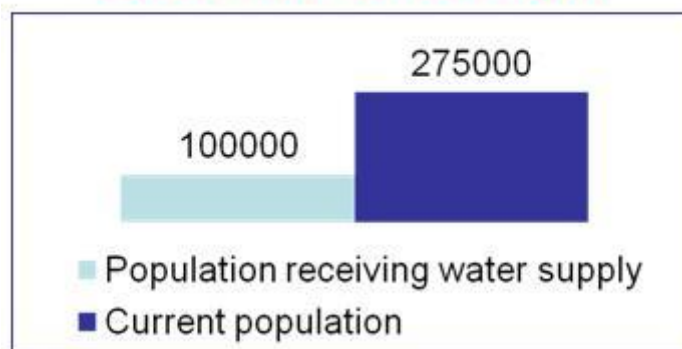
- Maintain required pressure in the distribution network, especially in tail end areas.
- Supply filtered and treated water to the residents according to GOP and WHO standards.
- Sampling and testing exercise was executed for drinking water of Jacobabad city. Samples were collected from Intake from Kirthar Canal, Intake Filter Plant, after filter plant, tube-well water, High-lift pumping station, Zone 1-A, Zone 1-B, Zone 2 and Zone 3. The World Health Organization (WHO) and Government of Pakistan (GOP) standards were used for comparison. Details of the sampling and testing are presented in the “Inception Report”.
- It was evaluated from the water analysis that the Turbidity and Coliform levels were on higher side. The turbidity level ranges from 12NTU to 510 NTU and Coliform level ranges from 120 cfu/100ml to 240cfu/100ml. The presence of coliforms in the drinking water indicates that there is high level of contamination by the infiltration of waste water in the distribution system. Heavy metals were not found in the samples. In comparison with WHO and GOP standards the analyzed values were found on higher side (WHO & GOP requirement for turbidity is < 5NTU and for coliforms 0.0cfu/100ml). It was revealed from the analysis that the filtration and disinfection systems were non-operational or malfunctioning. Following table shows the design influent and effluent characteristics in comparison with WHO & GOP standards:

Test	Kirthar Canal	Intake Filtration Plant	After Filtration Plant	Tube Well	High Lift PS	Zone 1-A	Zone 1-B	Zone 2	Zone 3	WHO Standards	GOP Standards
pH @ 25 °C	7.78	7.82	7.94	7.70	8.54	7.96	7.45	7.88	8.20	6.8-8.5	6.8-8.5
BOD	Nil	Nil	9.60	28.4	Nil	16.40	104.2	74.40	Nil	-	-
COD	Nil	Nil	37.3	115	Nil	66	411	293	Nil	-	-
TSS	64	16.00	4.00	2.00	12.00	4.00	45.00	4.00	2.00	-	-
TDS	165	158	932	2676	140	1078	5564	448	157	<500mg/L	<500mg/L
Turbidity	510	Nil	1	Nil	12	Nil	33	6	1	<5NTU	<5NTU
Cr	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	<0.05mg/L	≤0.05mg/L
Cu	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	<2mg/L	2mg/L
As	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	<0.01mg/L	≤0.05mg/L
Total Bacteria	3880	7440	11480	12640	880	5920	16000	3760	280	-	-
Total Coliform	Nil	240	120	2600	Nil	Nil	160	Nil	Nil	0.0cfu/100 ml	0.0cfu/100 ml
E-Coli	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.0cfu/100 ml	0.0cfu/100 ml

The details of aforementioned problems are presented in the “Inception Report”. Major limitations of the existing water supply system are summarized below:

- The water supply infrastructure was initially designed for 6.25 MGD to survive for up to year 2012 for a population of 200,000 people. However, the current water demand is escalated up to 8.25 MGD due to increase in population up to 275,000.
- The existing two raw water pools of 110 MG (500,000 m³) capacity each are insufficient to meet the increasing demand. There is a major concern of siltation and vegetation growth in these pools, as evident from PICTURE-4 given in the Photographic Record Section of this EDF.
- Only 65% to 70% area is covered with water supply network. Water is supplied for only 2-3 hours after a gap of 2 to 3 days. Even this limited supply is available for only 33% area in summer season and 50% area in winter season. This problem arises due to the shortage (load shedding) of electricity and unavailability of standby generation system. Due to shortage of electricity the pumping from the main sources of water i.e. Kirthar Canal and Water Filtration Plant are done for only 6-7 hours daily, so that the water supplied to the users is on rotational basis.
- Line leakages and damaged pipeline due to improper repair and maintenance pose extra burden to the current water supply. Furthermore, it also frequently results into mixing of sewage with water due to faulty design and low quality connections.
- One of the problems with the water supply system is the direct pumping of water from the filtration plant to the end users without any intermediate storage. The frequent load shedding causes a pressure drop in the system resulting in the infiltration of dirty water into the distribution system.

CURRENT SITUATION



DESCRIPTION OF THE PROPOSED INTERVENTION

USAID is funding Municipal Services Project (MSP) Jacobabad to improve and upgrade the water supply of Jacobabad city. The current water supply system of the city is inadequate and too dilapidated to serve the water needs of the residents. The designs of the proposed interventions has been prepared based on a detailed review of the existing water supply system and with due consideration to NSUSC master plan concepts for Jacobabad which is under final stage of completion. In the design it is considered that the sewage generated will be 70% of water supply; however the details of the sewage generation and system design will be separately discussed in the EDF of Rehabilitation, Improvement & Upgradation of Sewerage System Infrastructure.

The present system of direct pumping is proposed to be replaced with uninterrupted supplies from six Overhead Water Tanks spread all over the city. All major distributions would be metered and a provision of Distribution Network Improved (DNI) zone(s) would be provided to facilitate the NSUSC to implement consumption based billing for these areas.

Keeping in view the NSUSC metering approach, the proposed distribution system will consist of following;

- a. 600 mm diameter 6.7 km long transmission Loop feeding 6 Overhead Water Tanks
- b. 6 Overhead Water Tanks approx. 25 meters above ground level to supply water to respective distribution zones covering all the 8 union councils as mentioned in figure 4 of this report
- c. Distribution System in individual zones from Overhead Water Tanks
- d. Flow Meters provided on water transmission from Manifold and supplies to individual Overhead Water Tanks

The detailed design for the integrated water supply system comprising of water collection, transmission, and distribution is 100% complete. The design documents have been reviewed and approved by USAID engineers as well Project Management Unit (PMU) of Government of Sindh. Seven different design reports have been submitted as below:

- Water Intake and Storage System (Contract Package – 01)
- High Lift Pumping System & Rising Mains (Contract Package-02)
- Water Transmission Loop (Contract Package – 03)
- Water Distribution Network – Zone 1 & 2 (Contract Package – 04)
- Water Distribution Network – Zone 3 & 4 (Contract Package – 05)
- Water Distribution Network – Zone 5 & 6 (Contract Package – 06)
- Procurement and Installation of E&M Works Package-11 (Contract Package – 07)

The current population of Jacobabad has been estimated at 275,000 persons. However the design has been prepared to benefit the city until 2030 when the population of the city is projected to increase to more than 450,000 persons. The water system has been designed to support following major interventions in Jacobabad:

- Storage Pool (Pool #3, in addition to 02 existing pools)

To cover the shortage of water supply demand, quantity of raw water taken from Kirthar canal which is coming from Indus River need to be increased. A new water storage lagoon (3rd lagoon, 645m x 332.5m x 3.2 m deep with a storage capacity of 110 MG (500,000 m³)) will be constructed to increase the storage capacity during closure period of Kirthar canal.

- Water Intake system from Kirthar Canal (Gravity and Low Lift)

The intake from the Kirthar canal would also be augmented by installing 800mm (32”) diameter 300 m long gravity delivery pipe that will connect the canal with the third pool. The addition of this gravity pipe from Kirthar canal will also cover the future water supply demand of 14.50 MGD up to 2030.

- High Lift Pumping Stations and new Rising Main to Filtration Plant (2 x 600 mm diameter MS Pipes) – shown in figure - 3

The existing High Lift Pumping station is designed for the capacity of 6.5 MGD; therefore it is required to enhance the pumping capacity to 14.5 MGD. To meet the design capacity of 14.5 MGD pumping requirement, dedicated new pumps with 8 MGD capacity will be installed along with a new 600 mm diameter 20.75 km long Carbon Steel pipeline from High Lift Pumping Station to Filtration Plant. The enhanced pumping system will enable the delivery of full capacity flow in about 12 hours pumping. With the gradual increase in water requirement, the pumping hours can be increased and requirements can be met. Carbon steel pipeline, seamless or welded, complying with API5L-Grade B having a wall thickness of 6.4mm and outside diameter of 600mm (24”) with tested pressure of 435 psi (30 Bars) is recommended for the rising main. The pipeline shall be laid along the existing district road and parallel to the existing pipeline for which the Deputy Commissioner has already issued the No Objection Certificate. As such no exclusive Right of Way needs to be established for the new pipeline.

- Pumping and Transmission System Loop to Overhead Water Tanks as shown in figure - 4

The proposed system includes construction of 6 Overhead Water Tanks, approx. 25 meters above ground level to supply water to respective distribution zones. Carbon Steel transmission loop of 600 mm diameter 6.7 km starting from the manifold at the filtration plant will feed the 6 Overhead Water Tanks strategically located at various parts of the city. The details of overhead tanks are as follows:

Zone	Population to be Served (2030)	Height of OH Tank	Capacity of OH Tank
1	123,747	25 m	1,364 m ³
2	54,729	25 m	682 m ³
3	88,160	20 m	1,000 m ³
4	47,720	20 m	568 m ³
5	66,861	20 m	750 m ³
6	101,909	20 m	1,137 m ³

- Zone Wise Water Distribution Systems from 6 Overhead Water Tanks as shown in figure – 5.

The city water distribution system has been divided into six zones keeping in view the topographic and domestic features. The water demand for these zones varies from 1.43 MGD to 3.71 MGD. Each zone will be supplied from overhead water tank through a pipe network of various pipe sizes from 300 mm to 75 mm. The details of distribution network are as follows:

#	Material of Pipe	Diameter of Pipe (mm)	Length of Pipe (km)
1	HDPE	350	0.675
2	HDPE	300	7.65
3	HDPE	250	7.15
4	HDPE	200	4.8
5	HDPE	150	14.5
6	HDPE	100	20.4
7	HDPE	75	65.1

The Water Supply Zones are distinct from Sewerage System Zones in terms of geographical boundaries and population served. However, the service area for overall water supply system would also be served with sewerage disposal facilities (A separate EDF/EMMP shall be prepared for the sanitation/drainage system).

- Disaster Risk Reduction

In the design of complete water supply system especially the installation of all the electromechanical equipment are planned to withstand the flooding conditions of the city. All the new electro-mechanical equipment is being installed above the maximum expected flood elevation based on 100 years return period. Due considerations are also given to structural design of buildings with respect to seismic conditions of the project area which lies in the zone 2A and has moderate seismic risk. The proposed structures are designed to withstand seismic loads in accordance with the International Building Code (IBC) 2003 as stipulated by local codes and standards.

- Total Excavation and Backfilling Volume

Following table presents the estimated excavation and backfilling quantities for construction of water supply system:

#	Description	Excavation (m ³)	Backfilling (m ³)	Surplus Material (m ³)
1.	Water storage pool #3	582,615*	0.0	555,245
2.	800 mm (32") dia Pipe from Kirthar Canal to Water Storage Pool	150	49	101
3.	Generator Room at Low Lift Pumping Station	40	29	11
4.	Valve Chamber at Low Lift Pumping Station	135	35	100
5.	Outfall/Intake works at Low Lift Pumping Station	28	0.0	28
6.	New Pump room and Underground tank at High Lift Pumping Station	355	232	123
7.	Generator Room at High Lift Pumping Station	60	43	17

8.	600 mm (24") dia rising main from High Lift Pumping Station to Water Filtration Plant	39,945	30,653	9,292
9.	Valve chamber at High Lift Pumping Station	135	35	100
10.	Generator Room at Water Filtration Plant	40	29	11
11.	600 mm (24") dia ring rising main	25,125	21,641	3,484
12.	Valve chamber for the ring rising main	135	35	100
13.	Water distribution Network (Zone 1 to 6)	138,004	132,346	5,658
14.	Valve chambers for water distribution network (Zone 1 to 6)	405	105	300
15.	Overhead Water Tanks (Zone 1 to 6)	5,995	3,296	2,699
16.	Boundary Wall for Overhead Water Tanks (Zone 1 to 6)	156	36	120
Total		793,323	188,564	577,389

****27,370 m³ of the excavated material will be utilized for the embankments.***

The surplus material having volume of 577,389 m³ will be disposed off at depression areas present in Jacobabad city.

– Dovetailing of Public Recommendations in Design of the Project

Before finalizing the up-gradation of water supply scheme, public consultation in form of Focused Group Discussion (FGD) and workshops were held to have the public opinion on proposed improvements of the system. The FGD and workshops were conducted by design engineers of each discipline. The participants of focus groups (shown in Picture-7 and Picture-8) include NGO's, elders, youth and women from local inhabitants, the focus groups were:

- Mohala Committees,
- Christian Community,
- Hindu Community,
- Shehril tehad,
- International Medical Core Director for Asia,
- Ex and Present Counselors and Nazims, and
- Staff of UN-Habitat.

The details of the Focused Group Discussions (FGD) and public opinions are presented in **Section-F "Community workshops"** of **"Minutes of Meetings"** (from page # 115 to page # 132), submitted to USAID on 22nd February 2013.

The summary of recommendation from stakeholders and actions taken by design consultants are as follows:

Recommendations of Stakeholders	Action Taken
Water is not available for tail end users and water is not available in night	The proposed design incorporate the implementation of six (06) overhead tanks which ensures uninterrupted water supply at all times. The locations of overhead tanks are selected in such a manner so as to cover the entire population, as well as planned future expansion of the city.

Water is supplied only for two to three hours daily due to shortage of water as well as shortage of electricity	To cope up with the electricity shortage problem an additional dedicated 500 KW load from SEPCO/WAPDA shall be made available at high lift pumping station. Provision of standby generators of 200 kVA at low lift pumping station, 900 kVA at high lift pumping station and 300 kVA at water filtration plant to be shifted from High Lift pumping station is also considered in design for constant water supply.
Water is contaminated due to cross connection with sewerage lines	All the water supply lines, at crossings from the sewerage drains, are sleeved with carbon steel and the space between the pipe and sleeve is filled with cement concrete (CC).

Besides taking the above design considerations, USAID also intends to engage a specialized firm for community consultation, which will assist in looking after the social aspects of the construction activities.

- Integration of North Sindh Urban Services Corporation into the Project

Realizing that previous isolated efforts to raise standards of municipal services and increase citizen satisfaction have been fairly ineffective, the Government setup the Sindh Cities Improvement Project (SCIP) – a 10-year, \$400 million program under a \$300 million Asian Development Bank (ADB)-financed Multi-tranche Financing Facility (MFF) - to support improvements in basic urban infrastructure in Sindh's secondary towns through: (i) establishment of local government-owned, professionally-managed urban services corporations; (ii) urban sector reforms and capacity development; and (iii) priority investment in water supply, wastewater and solid waste management infrastructure. To operationalize these objectives, the Government of Sindh and the ADB established the North Sindh Urban Services Corporation (NSUSC). The SCIP Program Support Unit (PSU), which falls under the Planning and Development Department (P&DD), is the executing arm of the Program, while NSUSC is the implementing agency.

NSUSC, established under Companies Ordinance (1984), started operations in 2010. It is Pakistan's first utility company owned by participating local governments and is governed through a 17 member Board of Governors. NSUSC has aggregated participating Town Municipal Administration (TMA's) water supply, waste water and solid waste management operations in a single institution to leverage economies of scale, introduce new skills, better management, and increase focus on operations, maintenance and financial management. NSUSC has been officially mandated by the Government of Sindh to take over responsibility for management, including budget management, collection of user charges, and overall operations and maintenance of municipal infrastructure and services in participating TMAs of north Sindh, including Jacobabad.

Recognizing that a reform-oriented institutional platform for improving municipal services exists on-the-ground in the shape of NSUSC, USAID has decided to partner with SCIP/NSUSC for

implementation of the Jacobabad component of MSP. Towards this end, USAID has received official acknowledgement from NSUSC that it will take over responsibility for O&M of infrastructure developed and/or refurbished by USAID; and will include collection of user charges (Annex II). With the support of GoS and resource commitment from ADB, NSUSC is expected to put in place reforms that will improve and sustain municipal service delivery in Jacobabad.

GOVERNMENT OF SINDH (GOS) COOPERATION

Cooperation of Government of Sindh (GoS) is one of most important aspect of the project. In the water supply proposed improvement, the contribution of GoS is as under;

GoS Investment / Commitment*	Status
Land of 53 acres for canal water storage pool	Notification issued
Replacement of existing feeder with dedicated feeder of 764 KW (existing) load from SEPCO/WAPDA. This includes 200 new poles with 11K.V Dog Conductor from Jacobabad Grid station (SEPCO) to WFP, High lift & low lift pump House (Intake). This also includes replacement of existing burnt 200KVA Transformer to new 400KVA & Pole mounted Transformer at low lift pump House & its connection with water supply facility.	Payment of Rs. 45 million has already been made by Town Municipal Administration (TMA) and work is under progress
Additional Quantity of water supply in Kirthar canal as per requirement (66,000 m ³ per day). The approval is attached as annexure – I of this EDF.	Approval granted by Chief Minister Sindh.

* All these activities will be implemented by Government of Sindh itself without involvement of USAID.

ENTITIES INVOLVED IN PROJECT IMPLEMENTATION

Entity	Roles
USAID	Financial support, project management, technical supervision
Government of Sindh	Allotment of land, utility services, interdepartmental approvals
AA Associates	Design consultants
NSUSC	Operators of MSP
PMU	Coordination
Contractor	Construction and execution of project

This document has been prepared with detailed consultation with all the implementation partners. Two review meetings were held with the USAID environmental teams on 21 February 2013 and 03 October 2013. The Notes of these meetings are attached at Annexure IV of this EDF/EMMP.

OUTCOMES OF THE PROPOSED INTERVENTIONS

- The supply of water on 24/7 basis
- 100% area will be supplied with water in summer and winter seasons
- Health, Hygiene and Social Benefits of the Proposed Intervention
- Safe drinking water available on WHO and GOP standards
- Improved health & hygiene profile of the city population
- Reduction in waterborne diseases
- Reduction in open defecation & overall improvement in sanitation of the community
- Reduction in family health care expenses
- More privacy for household affairs
- Fewer days lost at work and schools.

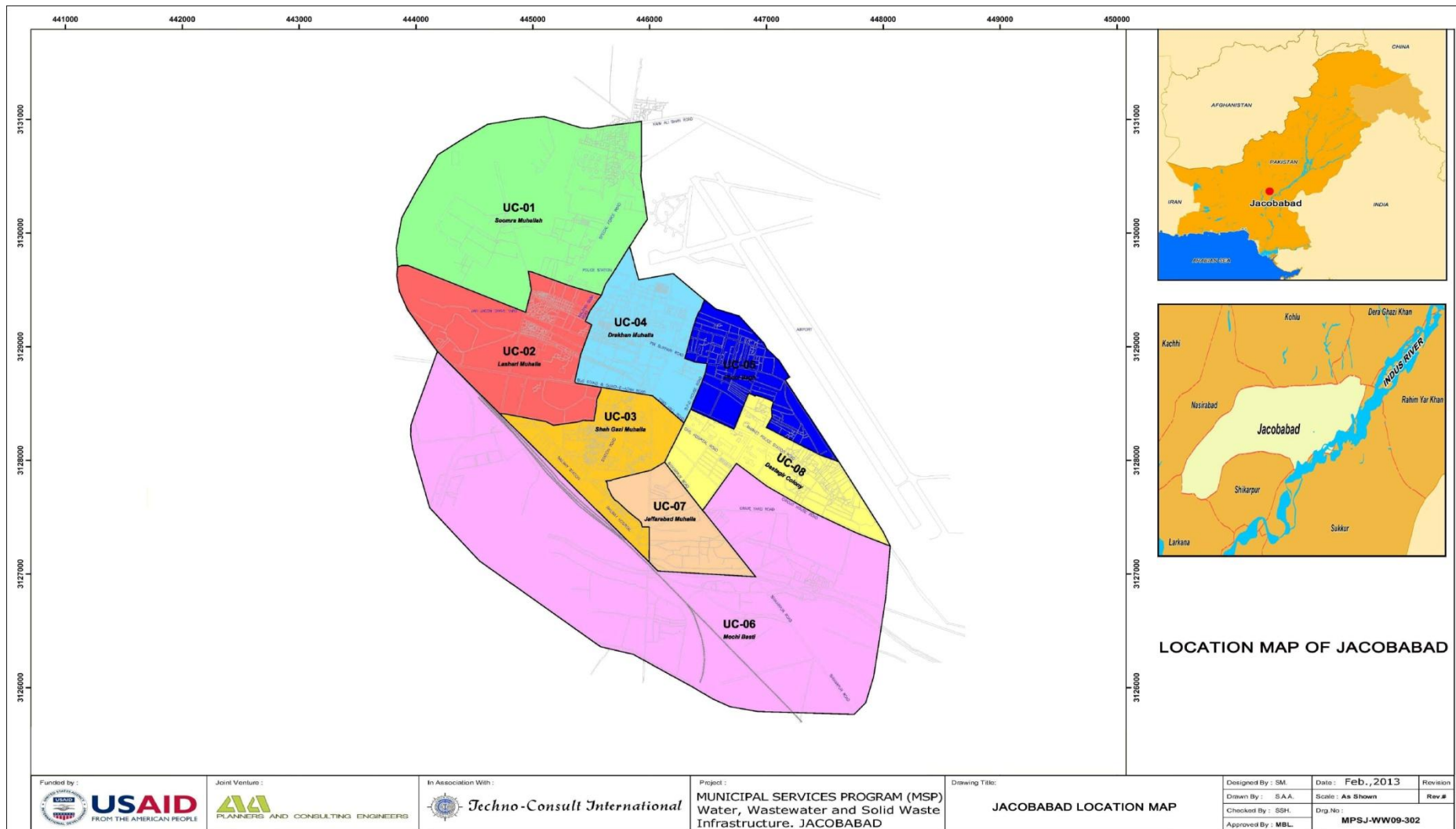
Figure 1: Key Map of Jacobabad City, Depicting 8 Union Councils and Their Administrative Boundaries

Figure 2: Seismic Zoning Map of Pakistan

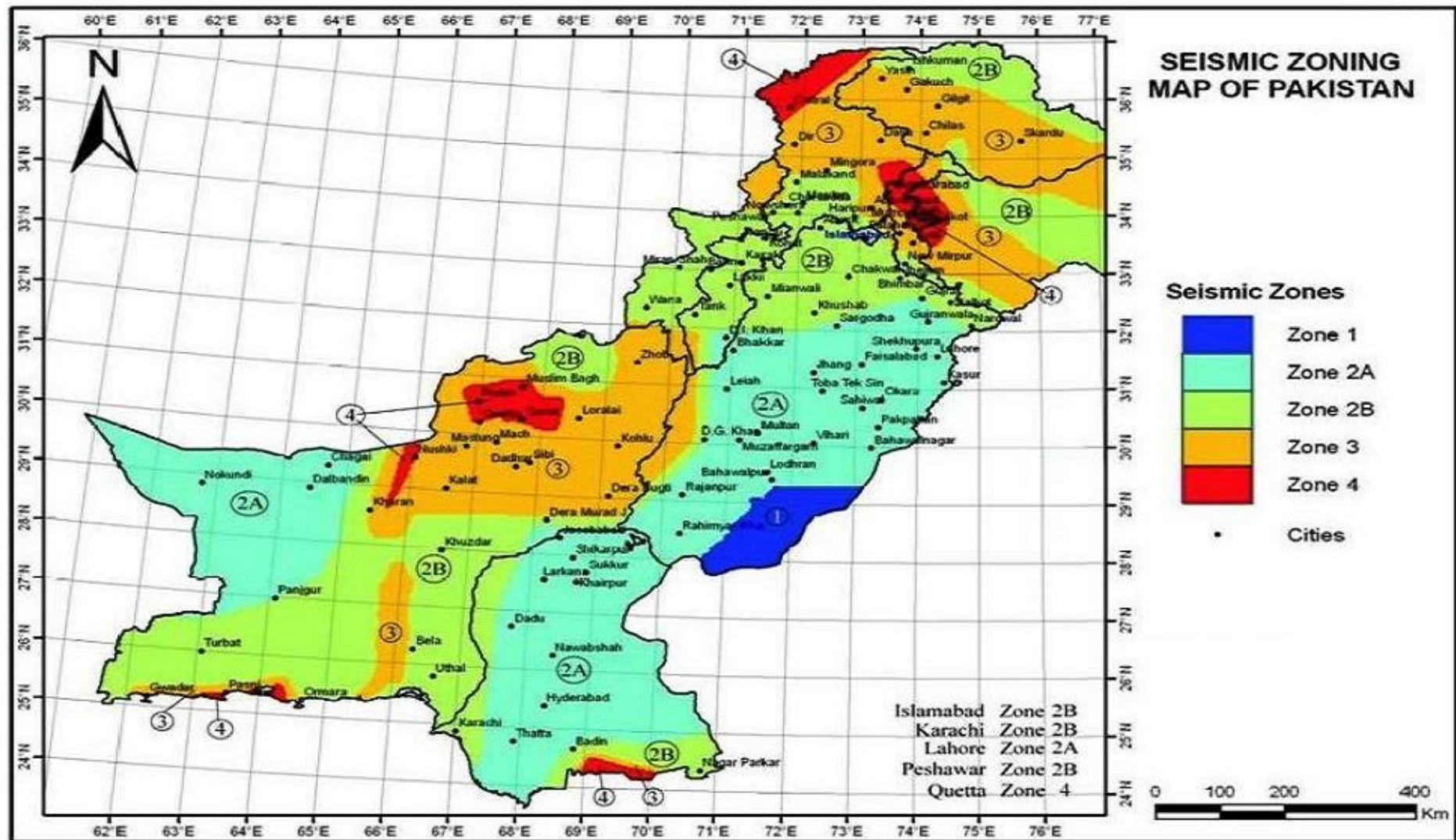


Figure 3: Route Plan 600 mm Rising Main from High Lift Pumping Station to Water Filtration Plant.



Figure 4: Proposed Ring Main for Jacobabad Water Supply Network.

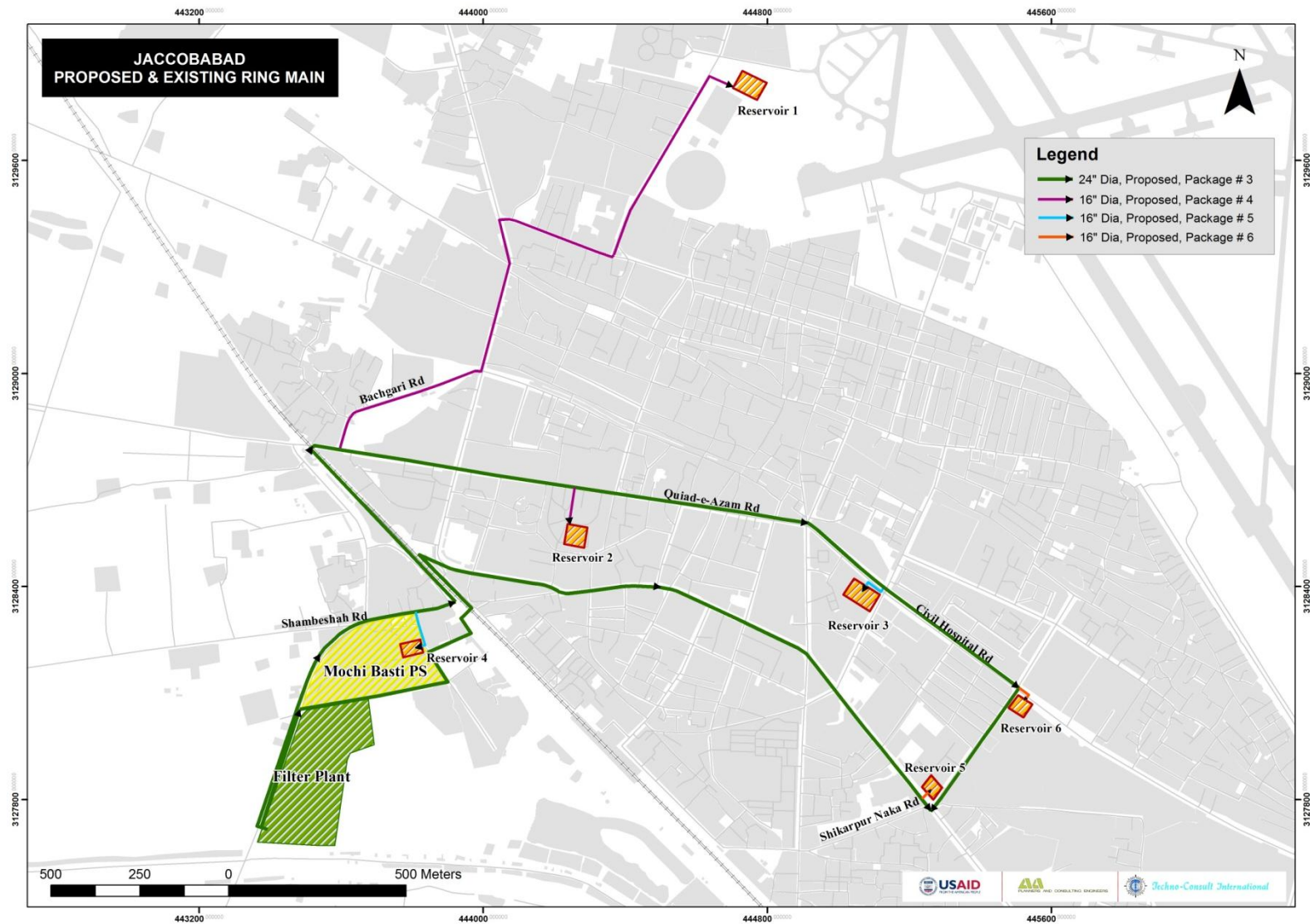


Figure 5: Water Supply Distribution Network of 6 Zones.

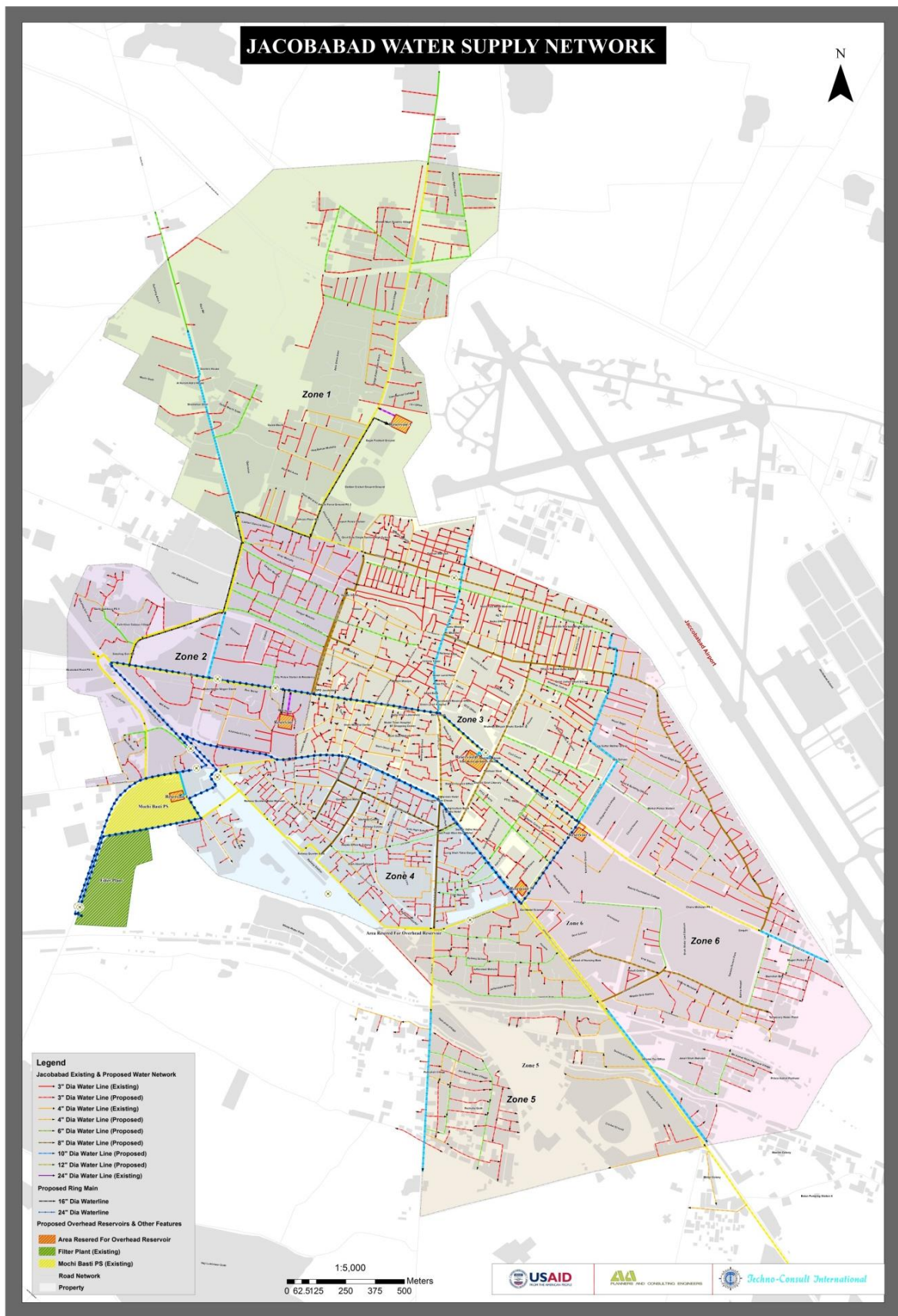


Figure 6: Water Supply Distribution Network Zone 1.

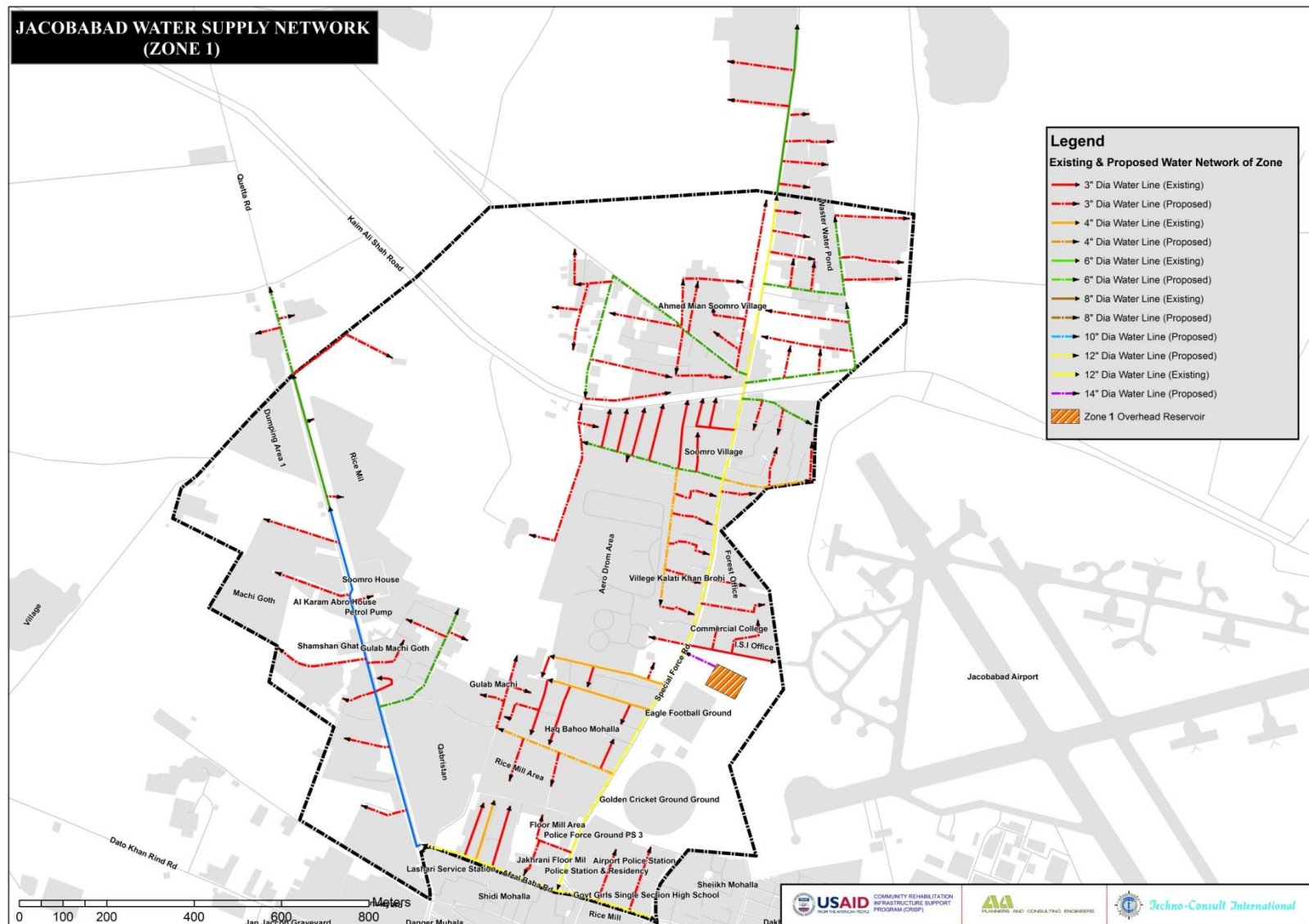


Figure 7: Water Supply Distribution Network Zone 2.

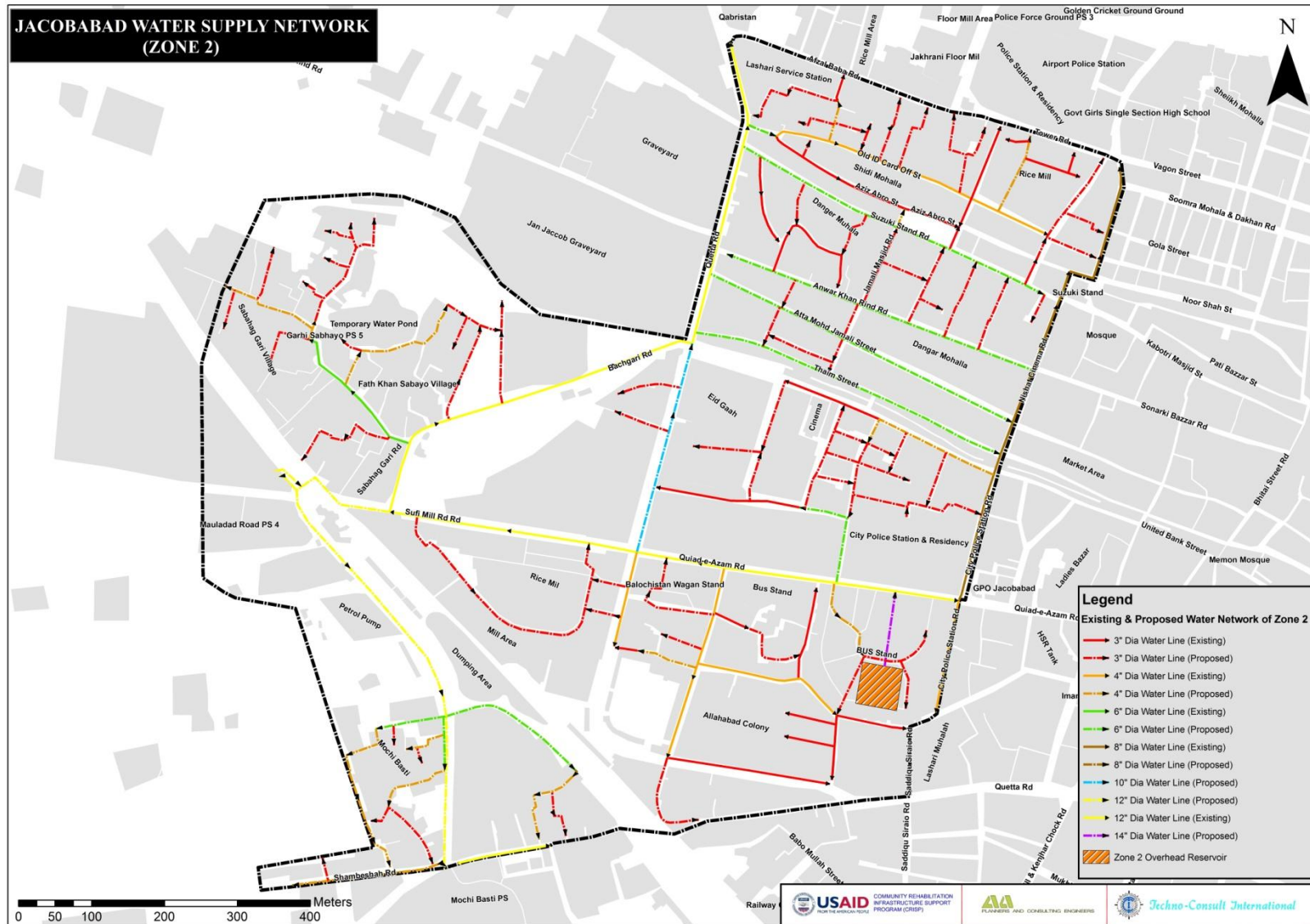


Figure 8: Water Supply Distribution Network Zone 3.

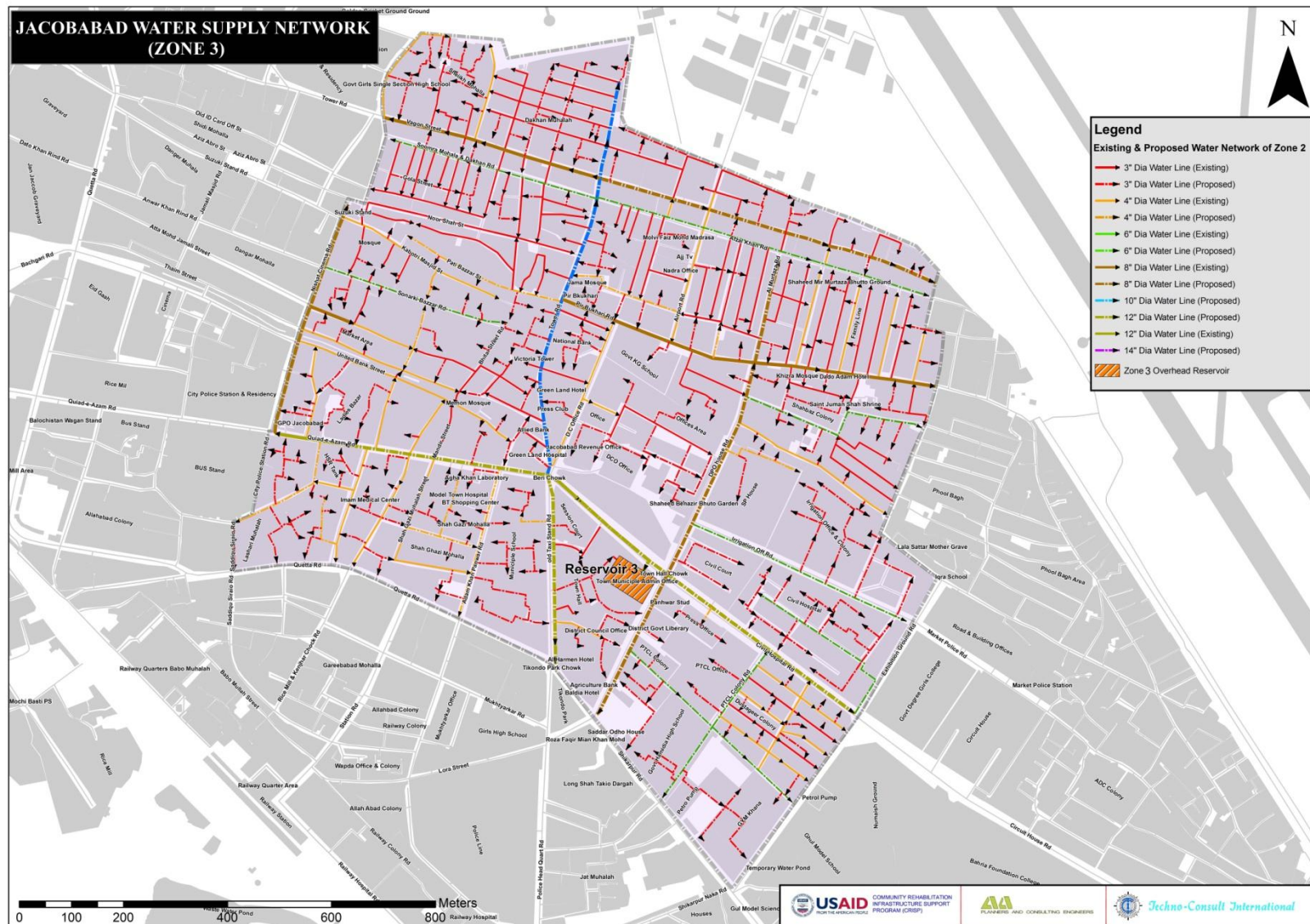


Figure 9: Water Supply Distribution Network Zone 4.

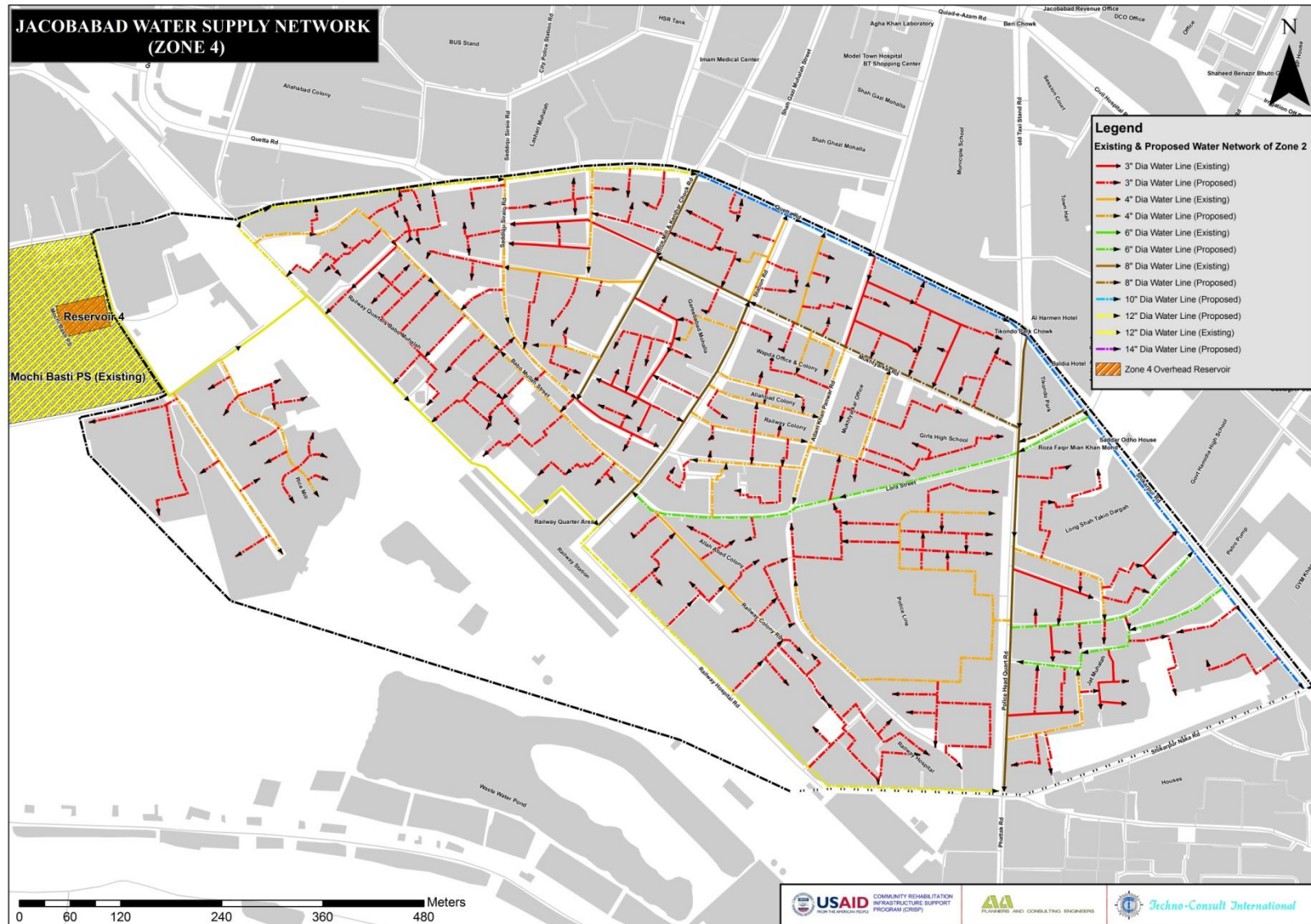


Figure 10: Water Supply Distribution Network Zone 6.

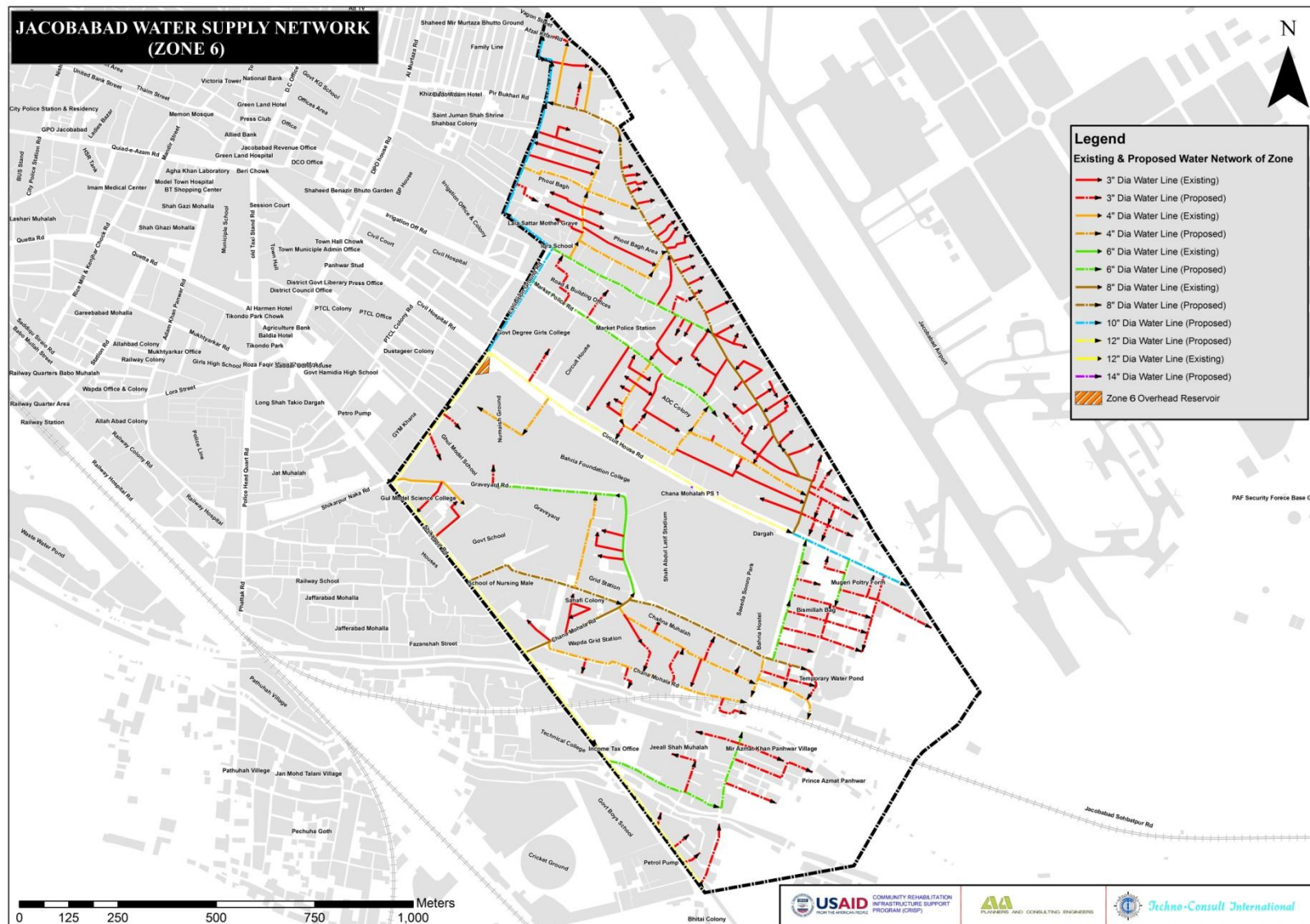
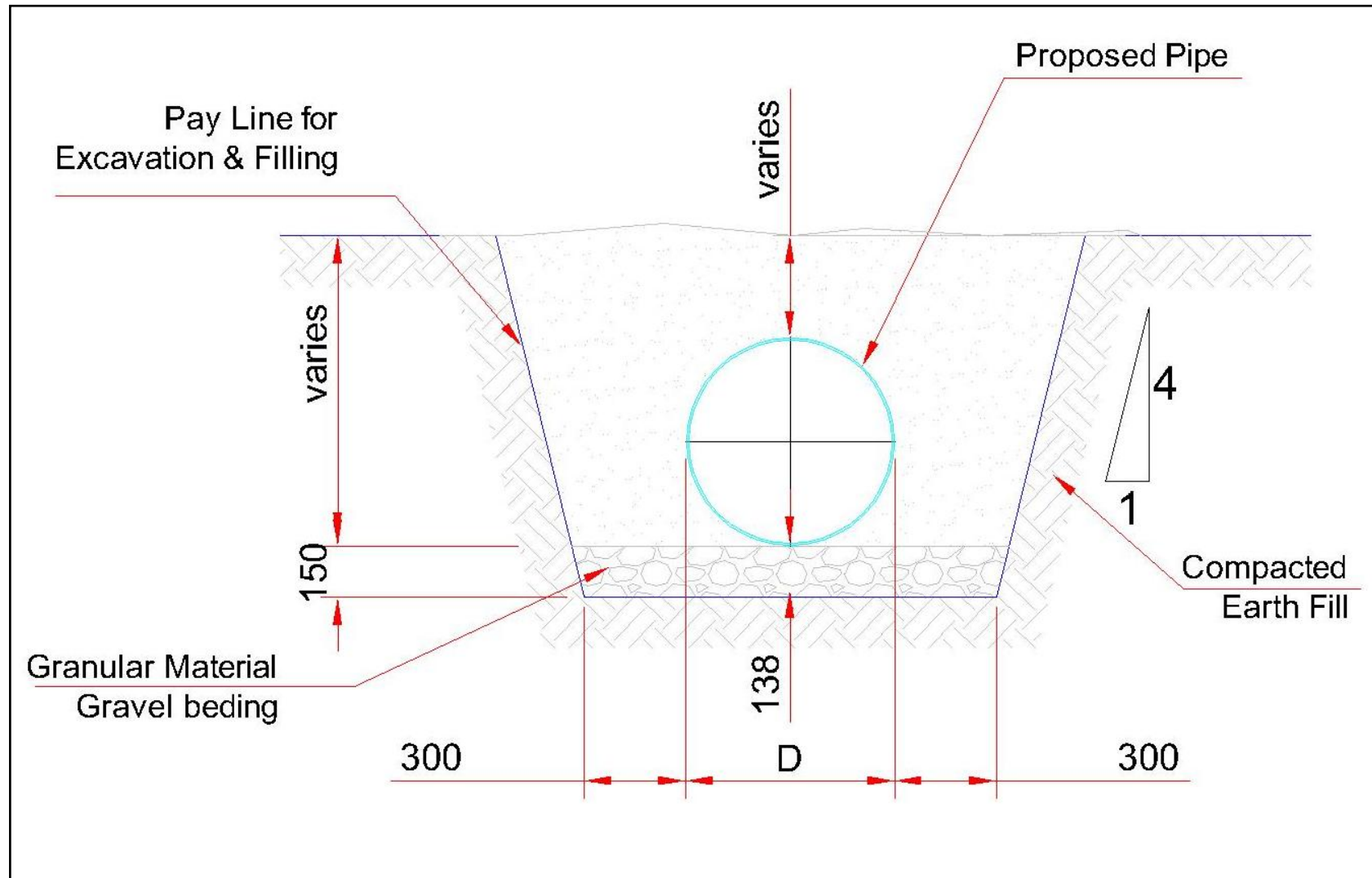


Figure 11: Typical Excavation Plan for proposed pipelines.

PHOTOGRAPHIC RECORD

PICTURE-1: INTAKE FROM KIRTHARCANAL: The GOS is arranging for increased intake from here



PICTURE-2: VIEW OF GRAVITY PIPE TO EXISTING RAW WATER POOLS: A similar pipe will be laid for the proposed pool # 3



PICTURE-3: LOW LIFTING PUMPING STATION & CONDITION OF PUMPS: The pumps will be rehabilitated in the project



PICTURE-4: VEGETATION AT EXISTING RAW WATER POOLS: The proposed intervention seeks to remove this vegetation and also desiltation.



PICTURE-5: EXISTING RISING MAIN: Air valves of this rising main will be repaired and / or replaced



PICTURE-6: EXISTING WATER CONNECTIONS TO HOUSES: Their dilapidated conditions result into many water losses and contamination issues.



PICTURE-7: First Community Meeting in TMA Office, Jacobabad on 18-07-2012.



PICTURE-8: Women, youth and elder participation in Community Workshop in MSP Project Office, Jacobabad on 28-01-2013.



B. DESCRIPTION OF ACTIVITIES AND ISSUES WITH RESPECT TO POTENTIAL ENVIRONMENTAL & SOCIAL IMPACTS

SIGNIFICANCE CRITERIA

#	CRITERIA TO EVALUATE ADVERSE IMPACT
1.0 General	
1	Environmental loss and deterioration
2	Social impacts resulting directly or indirectly from environmental change
3	Non-conformity with environmental standards, objectives and guidelines
1.1 Natural resources, ecological functions or designated areas	
1	Reductions in species diversity
2	Depletion or fragmentation on plant and animal habitat
3	Loss of threatened, rare or endangered species
4	Impairment of ecological integrity, resilience or health <ul style="list-style-type: none"> • disruption of food chains • decline in species population
1.2 Social Impacts	
1	Threats to human health and safety
2	Decline in commercially valuable or locally important species or resources e.g. forests and agricultural land etc.
3	Loss of areas or environmental components that have cultural, recreational or aesthetic value
4	Displacement of people
5	Disruption of communities by influx of a workforce e.g. during project construction
6	Pressures on services, transportation and infrastructure
1.3 Environmental standards, objectives and targets	
1	Prescribed limits on waste/emission discharges and/or concentrations
2	Ambient air and water quality standards established by law or regulations
3	Environmental objectives and targets contained in policy and strategy
4	Approved or statutory plans that protect areas or allocate, zone or regulate the use of land and natural resources

ACTIVITY / ISSUE	POTENTIAL IMPACT*
COMPONENT-1: IMPROVEMENT & ENHANCEMENT OF WATER INTAKE FROM KIRTHAR CANAL	
A. Design and Planning Phase	
Availability of increased quantity of water supply as per design demand at Kirthar Canal	• Failure of design
Consideration for loss of vegetation	• No potential impact
Topographical survey of the area	• No potential impact
Monitoring of characteristics of available water source (Kirthar Canal)	• No potential impact
B. Construction and Procurement Phase	
Procurement of 800 mm dia carbon steel pipe and its accessories for water supply from Kirthar	• No potential impact

Canal to Water Storage Pool #3	
Procurement and installation of 200 kVA (400 V – 3 Phase) diesel generator for low lift pumping station	<ul style="list-style-type: none"> • No potential impact
Procurement of glycerin-filled Pressure Gauge at the discharge lines of each pump at low lift pumping station	<ul style="list-style-type: none"> • No potential impact
Establishment of Campsite and Machinery/ Equipment Yard	<ul style="list-style-type: none"> • Changes in land use pattern • Influx of external work force • Cultural conflicts • Workshop facilities will spread oils & chemicals • Deterioration of air quality due to machinery & equipment • Noise • Land degradation due to solid waste disposal of camp site
Minor maintenance works of six pumps already installed at low lift pumping station	<ul style="list-style-type: none"> • No potential impact
Excavation and laying of 800 mm dia carbon steel pipe at a length of 300 m for water supply from Kirthar Canal to Water Storage Pool #3	<ul style="list-style-type: none"> • Deterioration of air quality • Soil erosion • Site overburden • Surface water contamination by wind erosion • Noise pollution • Health and Safety issues
Loss of vegetation due to site clearance	<ul style="list-style-type: none"> • No potential impact
Construction of generator building at low lift pumping station	<ul style="list-style-type: none"> • No potential impact
Desilting and removal of vegetation from existing water storage pool #1 & 2.	<ul style="list-style-type: none"> • Soil and groundwater contamination • Land degradation due to waste disposal
C. Operation & maintenance Phase	
Monitoring of water quantity supplied from the source (Kirthar Canal).	<ul style="list-style-type: none"> • Shortage of water supply
Monitoring of water pollution at the source (Kirthar Canal).	<ul style="list-style-type: none"> • Water pollution
Air pollution of diesel generator installed at low lift pumping station	<ul style="list-style-type: none"> • Air pollution • Health issues
Noise pollution due to pumps and diesel generator at low lift pumping station	<ul style="list-style-type: none"> • Noise pollution • Health issues
Fire hazard at pump room and diesel generator building at low lift pumping station	<ul style="list-style-type: none"> • Health & safety issue • Structural damage of pump room and generator building • Impairment of pumps and generator
Health and safety issues due to operation and maintenance activity at low lift pumping station	<ul style="list-style-type: none"> • Health & safety issues
Waste generation due to operation and	<ul style="list-style-type: none"> • No potential impact

maintenance activity at low lift pumping station	
Removal of vegetation and desilting from water storage pool #1&2.	<ul style="list-style-type: none"> • Soil and groundwater contamination • Land degradation due to waste disposal
COMPONENT-2: CONSTRUCTION OF NEW WATER POOL	
A. Design and Planning Phase	
Land acquisition for 3 rd canal water storage pool	<ul style="list-style-type: none"> • No potential impact as land allocated is government land and no issue of resettlement
Topographical survey of the area	<ul style="list-style-type: none"> • No potential impact
Consideration for loss of vegetation	<ul style="list-style-type: none"> • No potential impact
B. Construction and Procurement Phase	
Loss of vegetation due to site clearance	<ul style="list-style-type: none"> • No potential impact
Excavation works for Water Storage Pool #3.	<ul style="list-style-type: none"> • Deterioration of air quality • Soil erosion • Site overburden • Surface water contamination by wind erosion • Noise pollution • Health and Safety issues
Embankment works for Water Storage Pool #3.	<ul style="list-style-type: none"> • No potential impact
C. Operation and MaintenancePhase	
Removal of vegetation and desilting from water storage pool #3.	<ul style="list-style-type: none"> • Soil and groundwater contamination • Land degradation due to waste disposal • Health and Safety issues
COMPONENT-3: PUMPING CAPACITY ENHANCEMENT	
A. Design and Planning Phase	
Design works for rehabilitation and up-gradation of high lift pumping station.	<ul style="list-style-type: none"> • No potential impact
Condition assessment of Vertical Deep Well Turbine (DWT) Pumps at High Lift Pumping Station.	<ul style="list-style-type: none"> • No potential impact
Design of new water distribution main from high lift pumping station to water filtration plant and its alignment.	<ul style="list-style-type: none"> • Environmental and social impacts due to Water distribution mains alignment design.
Land acquisition for Right of Way (ROW) of new rising main	<ul style="list-style-type: none"> • No potential impact as land allocated is government land and no issue of resettlement
Probability of electricity failure	<ul style="list-style-type: none"> • Shutdown of water supply
Selection of Genset as per the required load	<ul style="list-style-type: none"> • Impairment of generators • Use of excessive fuel
B. Construction and Procurement Phase	
Procurement and installation of 900 kVA (400 V – 3 Phase)diesel generator for high lift pumping station	<ul style="list-style-type: none"> • No potential impact
Procurement of flow meter for 600 mm rising main	<ul style="list-style-type: none"> • No potential impact
Procurement of 600 mm dia carbon steel rising	<ul style="list-style-type: none"> • No potential impact

main and its accessories	
Establishment of Campsite and Machinery/ Equipment Yard	<ul style="list-style-type: none"> • Changes in land use pattern • Influx of external work force • Cultural conflicts • Workshop facilities will spread oils & chemicals • Deterioration of air quality due to machinery & equipment • Noise • Land degradation due to solid waste disposal of camp site
Excavation works for 600 mm dia carbon steel rising main	<ul style="list-style-type: none"> • Deterioration of air quality • Soil erosion • Site overburden • Noise pollution • Health and Safety issues
Laying of 20.75 km long 600 mm dia carbon steel rising main.	<ul style="list-style-type: none"> • Interruption of utility services • Severance of pedestrian and vehicle access
Minor repair works at high lift pumping station "pump room, underground water tank and generator room".	<ul style="list-style-type: none"> • No potential impact
Minor maintenance works of seven pumps already installed at high lift pumping station	<ul style="list-style-type: none"> • No potential impact
After minor maintenance works shifting and re-installation of the six DWT pumping sets from water filtration plant to high lift pumping station	<ul style="list-style-type: none"> • No potential impact
Repairing of available 300 kVA standby diesel generator set at high lift pumping station and shifting of this generator to water filtration plant.	<ul style="list-style-type: none"> • No potential impact
C. Operation and Maintenance Phase	
Monitoring of water quantity supplied from high lift pumping station.	<ul style="list-style-type: none"> • Shortage of water supply and operational problems in water filtration plant
Air pollution of diesel generator installed at high lift pumping station	<ul style="list-style-type: none"> • Air pollution • Health issues
Noise pollution due to pumps and diesel generator at high lift pumping station	<ul style="list-style-type: none"> • Noise pollution • Health issues
Fire hazard at pump room and diesel generator building at high lift pumping station	<ul style="list-style-type: none"> • Health & safety issues • Structural damage of pump room and generator building • Impairment of pumps and generator
Health and safety issues due to operation and maintenance activity at high lift pumping station	<ul style="list-style-type: none"> • Health & safety issues
Waste generation due to operation and maintenance activity at high lift pumping station	<ul style="list-style-type: none"> • No potential impact
Maintenance of air release valves in rising mains	<ul style="list-style-type: none"> • Lack of maintenance will cause loss of water and impairment of rising main

Illegal water connections in rising mains	<ul style="list-style-type: none"> • Loss of pressure in rising main • Impairment of rising main
COMPONENT-5: PUMPING & TRANSMISSION SYSTEM LOOP TO OVERHEAD WATER TANKS	
A. Design and Planning Phase	
Land acquisition for pipeline ROW and for construction of new OH water tanks	<ul style="list-style-type: none"> • No potential impact as land allocated is government land and no issue of resettlement
Design of new Rising Main (Carbon Steel) 600 mm dia from water filtration plant to overhead tanks	<ul style="list-style-type: none"> • Interruption of utility services • Severance of pedestrian access • Traffic congestion • Buffer distance to sensitive receivers to prevent nuisance and achieve safety criteria.
Requirement of new Vertical Deep Well Turbine (DWT) Pumps	<ul style="list-style-type: none"> • No potential impact
Probability of electricity failure	<ul style="list-style-type: none"> • Shutdown of water supply
Topographical survey of the area	<ul style="list-style-type: none"> • No potential impact
Design of new Generator Room Building	<ul style="list-style-type: none"> • No potential impact
Selection of Genset as per the required load	<ul style="list-style-type: none"> • Impairment of generators • Use of excessive fuel
Public consultation and sharing of proposed design considerations	<ul style="list-style-type: none"> • Social issues
B. Construction and Procurement Phase	
Procurement of new Rising Main (Carbon Steel) 600 mm dia from water filtration plant to all six overhead tanks.	<ul style="list-style-type: none"> • No potential impact
Procurement of flow meter for new Rising Main (Carbon Steel) 600 mm dia.	<ul style="list-style-type: none"> • No potential impact
Procurement of flow meter for 600 mm Carbon Steel distribution line of all six Overhead Water Tanks	<ul style="list-style-type: none"> • No potential impact
Procurement and Installation of 12 new DWT Pumps having capacity of 243 m ³ /hr	<ul style="list-style-type: none"> • No potential impact
Establishment of Campsite and Machinery/ Equipment Yard	<ul style="list-style-type: none"> • Changes in land use pattern • Influx of external work force • Cultural conflicts • Workshop facilities will spread oils & chemicals • Deterioration of air quality due to machinery & equipment • Noise • Land degradation due to solid waste disposal of camp site
Deep excavation works of approx 2 m to 3 m for new Rising Main (Carbon Steel) 600 mm dia from water filtration plant to overhead tanks	<ul style="list-style-type: none"> • Deterioration of air quality • Soil erosion • Site overburden • Noise pollution • Air pollution

	<ul style="list-style-type: none"> • Interruption of existing utility services • Chances of accidents due to deep excavation • Health and Safety issues • Traffic congestion due to excavation and stockpiling of excavated material
Laying of 6.7 km long new Rising Main (Carbon Steel) 600 mm dia from water filtration plant to overhead tanks	<ul style="list-style-type: none"> • Interruption of utility services • Severance of pedestrian and vehicle access • Health and Safety issues • Traffic congestion
Construction of generator building	<ul style="list-style-type: none"> • No potential impact

C. Operation and Maintenance Phase

Monitoring of water quantity and quality supplied from water filtration plant pumping station.	<ul style="list-style-type: none"> • Shortage of water supply • Health issues • Social Issues
Air pollution of diesel generator installed at water filtration plant.	<ul style="list-style-type: none"> • Air pollution • Health issues
Noise pollution due to pumps and diesel generator at water filtration plant.	<ul style="list-style-type: none"> • Noise pollution • Health issues
Fire hazard at pump room and diesel generator building at water filtration plant.	<ul style="list-style-type: none"> • Health & safety issues • Structural damage of pump room and generator building • Impairment of pumps and generator
Health and safety issues due to operation and maintenance activity of pumps and diesel generator installed at water filtration plant.	<ul style="list-style-type: none"> • Health & safety issues
Waste generation due to operation and maintenance activity.	<ul style="list-style-type: none"> • No potential impact
Illegal water connections in new rising main and distribution pipe to all six Overhead Water Tanks	<ul style="list-style-type: none"> • Loss of pressure in rising main • Impairment of rising main

COMPONENT-6: ZONE WISE WATER DISTRIBUTION SYSTEM & CONSTRUCTION OF OVERHEAD WATER TANKS

A. Design and Planning Phase

Topographical survey of the area	<ul style="list-style-type: none"> • No potential impact
Design considerations for disruption of existing water supply services	<ul style="list-style-type: none"> • Social issues
Design considerations to prevent the risk of contamination of sewage into water supply	<ul style="list-style-type: none"> • Water pollution • Health issues • Social issues
Design considerations for meeting the daily demand of water supply	<ul style="list-style-type: none"> • Social issues
Probability of electricity failure	<ul style="list-style-type: none"> • Shutdown of water supply
Design considerations for traffic congestion due laying of water distribution network	<ul style="list-style-type: none"> • Traffic congestion • Social issues
Public consultation and sharing of proposed design considerations	<ul style="list-style-type: none"> • Social issues

B. Construction and Procurement Phase		
Procurement of 350 mm HDPE pipe from all six Overhead Water Tanks to distribution network		<ul style="list-style-type: none">• No potential impact
Procurement of 350 mm to 75 mm HDPE pipe for distribution network for zone1, zone2, zone3, zone4, zone5, and zone6.		<ul style="list-style-type: none">• No potential impact
Establishment of Campsite and Machinery/ Equipment Yard		<ul style="list-style-type: none">• Changes in land use pattern• Influx of external work force• Cultural conflicts• Workshop facilities will spread oils & chemicals• Deterioration of air quality due to machinery & equipment• Noise• Land degradation due to solid waste disposal of camp site
Excavation works for 350 mm HDPE pipe from all six Overhead Water Tanks to distribution network and 350 mm to 75 mm HDPE pipe for distribution network for zone1, zone2, zone3, zone4, zone5, and zone6.		<ul style="list-style-type: none">• Deterioration of air quality• Soil erosion• Site overburden• Noise pollution• Air pollution• Interruption of existing utility services• Health and Safety issues• Traffic congestion due to excavation and stockpiling of excavated material
Laying of 0.675 km long 350 mm dia HDPE pipe from all six Overhead Water Tanks to distribution network.		<ul style="list-style-type: none">• Interruption of utility services• Severance of pedestrian and vehicle access• Traffic congestion
Laying of 350 mm to 75 mm dia HDPE pipe for distribution network for zone1, zone2, zone3, zone4, zone5, and zone6 as per following details:		<ul style="list-style-type: none">• Interruption of utility services• Severance of pedestrian and vehicle access• Interruption of existing utility services• Traffic congestion
#	Diameter of Pipe (mm)	Length of Pipe (km)
1	300	7.65
2	250	7.15
3	200	4.8
4	150	14.5
5	100	20.4
6	75	65.1
Construction of 25 m high water tank of 1,364 m ³ for zone1.		<ul style="list-style-type: none">• Air pollution due to construction activities• Noise Pollution due to construction activities• Chances of accidents due to construction activities• Interruption of existing utility services• Health and safety issues due to construction activities

	<ul style="list-style-type: none"> • Traffic congestion
Construction of 25 m high water tank of 682 m ³ for zone2.	<ul style="list-style-type: none"> • Air pollution due to construction activities • Noise Pollution due to construction activities • Chances of accidents due to construction activities • Interruption of existing utility services • Health and safety issues due to construction activities • Traffic congestion
Construction of 20 m high water tank of 1,000 m ³ for zone3.	<ul style="list-style-type: none"> • Air pollution due to construction activities • Noise Pollution due to construction activities • Chances of accidents due to construction activities • Interruption of existing utility services • Health and safety issues due to construction activities • Traffic congestion
Construction of 20 m high water tank of 568 m ³ for zone4.	<ul style="list-style-type: none"> • Air pollution due to construction activities • Noise Pollution due to construction activities • Chances of accidents due to construction activities • Interruption of existing utility services • Health and safety issues due to construction activities • Traffic congestion
Construction of 20 m high water tank of 750 m ³ for zone5.	<ul style="list-style-type: none"> • Air pollution due to construction activities • Noise Pollution due to construction activities • Chances of accidents due to construction activities • Interruption of existing utility services • Health and safety issues due to construction activities • Traffic congestion
Construction of 20 m high water tank of 1,137 m ³ for zone6.	<ul style="list-style-type: none"> • Air pollution due to construction activities • Noise Pollution due to construction activities • Chances of accidents due to construction activities • Interruption of existing utility services • Health and safety issues due to construction activities • Traffic congestion
C. Operation and MaintenancePhase	
Monitoring of water quantity supplied.	<ul style="list-style-type: none"> • Shortage of water supply
Monitoring of water pollution at each overhead water tank delivery and end users	<ul style="list-style-type: none"> • Health issues • Social Issues
Illegal water connections	<ul style="list-style-type: none"> • Loss of pressure in distribution network • Impairment of distribution network • Social issues

Contamination of sewage in water supply	<ul style="list-style-type: none">• Health issues• Social issues
---	---

Mitigation measures are provided in **Table 1*

D. ENVIRONMENTAL MITIGATION ACTIONS (INCLUDING MONITORING)

Work plan and schedule identifying the activity, mitigation measures, monitoring indicators and responsible parties is provided in **Table 1: Environmental Mitigation and Monitoring Plan (EMMP)**

Monitoring: Site Staff and Environmental Specialist will be monitoring the mitigation measures throughout the project including daily monitoring and environmental audits. Environmental audits will be undertaken after specified intervals of time. Environmental monitoring will also be reported as EMMP Implementation Reports quarterly to USAID COR. However the major non-compliance would be immediately reported.

Responsible Parties: During development and before completion and handover of the project to the concerned Department, the engineering team will ensure that the design has been reviewed properly and is based on sound engineering design principles and relevant practices.

During the construction and development of the project, the contractor will implement all required mitigation measures under the supervision and monitoring of the assigned engineering staff and field supervisors. Once the completion certificate is signed, responsibility for performing any post-construction mitigation and monitoring will be the responsibility of proponent of the project i.e. the Local Government of Jacobabad City.

E. OTHER RELEVANT INFORMATION

This Environmental Mitigation and Monitoring Plan (EMMP), after approval, would be made part of the contract documents for the construction to be procured by Project Management Unit (PMU). The measures specified herein would be binding upon the constructors and their sub-contractors. This EMMP would also be reviewed at pre-construction stage together with the constructors and, if needed, refined for an optimal utilization during the construction.

Table 1: Environmental Mitigation and Monitoring Plan (EMMP)

Activity	Potential Impacts	Mitigation Measures	Monitoring Indicators	Monitoring and Reporting Frequency	Party(ies) Responsible	Indicative Budget**
COMPONENT-1: IMPROVEMENT & ENHANCEMENT OF WATER INTAKE FROM KIRTHAR CANAL						
A. Design and Planning Phase						
Availability of increased quantity of water supply as per design demand at Kirthar Canal	<ul style="list-style-type: none"> Failure of design 	<ul style="list-style-type: none"> Permit of additional 66,000 m³/day water supply to Kirthar Canal from Irrigation Department In design both gravity and pumping system consideration are taken for extracting water from Kirthar Canal 	<ul style="list-style-type: none"> Availability of the Permit from Irrigation department before project operationalization Testing of the newly installed system before its commissioning 	<ul style="list-style-type: none"> Once before issuance of Completion Certificate to Contractor 	<ul style="list-style-type: none"> Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
B. Construction and Procurement Phase						

Establishment of Campsite and Machinery/ Equipment Yard	<ul style="list-style-type: none"> • Changes in land use pattern • Social conflicts 	<ul style="list-style-type: none"> • Site for camp site shall be selected keeping in view the cultural norms of the area to avoid undue interference of the contractor's staff with the local residents. • Local residents will be given priority in the employment opportunities generated during construction and operations phase • The land will be rented for the camp site and equipment yard. No resettlement is envisaged for this purpose. 	<ul style="list-style-type: none"> • Monthly rent receipts. • Development & implementation of policy on local employments 	<ul style="list-style-type: none"> • Monthly 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
	<ul style="list-style-type: none"> • Oil and chemicals spread at Workshop facilities 	<ul style="list-style-type: none"> • Proper disposal of used oil and chemical waste in accordance with MSDS will be ensured. • Efficient Use of Chemicals will be ensured. • Good housekeeping practices will be ensured at workshop areas. • Mixing of waste into fresh water resources will not be allowed. 	<ul style="list-style-type: none"> • Visual inspection • Monitoring of Oil & Grease at equipment yard and workshop. USEPA IRIS Database for VOCs will be followed for the monitoring. 	<ul style="list-style-type: none"> • Daily monitoring & Quarterly reporting 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring

	<ul style="list-style-type: none"> Deterioration of air quality due to machinery & equipment 	<ul style="list-style-type: none"> Proper engine tuning of machinery/ equipment to meet National Environmental Quality Standards of Pakistan limits and USEPA Tier 4 standards 2014 will be ensured. 	<ul style="list-style-type: none"> Monitoring will be done on stack of machinery and equipment. The parameters required to be monitored are Smoke, H₂S, SO_x, CO, VOCs and NO_x. 	<ul style="list-style-type: none"> Monthly monitoring& Quarterly reporting 	<ul style="list-style-type: none"> Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	USD \$ 1,000
	<ul style="list-style-type: none"> Noise 	<ul style="list-style-type: none"> Equipment with high levels will be fitted with noise reduction devices Regular inspection, maintenance and lubrication of the construction vehicle and equipment will be performed Use of PPEs such as ear plugs and ear muffs by the workers will be ensured Avoid night time activity 	<ul style="list-style-type: none"> Monitoring compliance to NEQS for noise (SRO 72 (KE) / 2009) The sampling will be done twice on monthly basis at 7m from the source. The duration of sampling will be 24 hours @ 15 seconds interval over 15 minutes every hour (averaged) 	<ul style="list-style-type: none"> Fortnightly monitoring& Quarterly reporting 	<ul style="list-style-type: none"> Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	USD \$ 400
	<ul style="list-style-type: none"> Land degradation due to solid waste disposal of camp site 	<ul style="list-style-type: none"> Ensure proper disposal of camp site waste at designated landfill sites. Good housekeeping practices within the camp site will be adopted to minimize waste generation. Disposal of campsite waste near residential colonies or in agricultural fields will not be allowed 	<ul style="list-style-type: none"> Visual inspection 	<ul style="list-style-type: none"> Weekly monitoring & Quarterly reporting 	<ul style="list-style-type: none"> Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring

<p>Excavation and laying of 800 mm dia carbon steel pipe at a length of 300 m for water supply from Kirthar Canal to Water Storage Pool #3²²</p>	<ul style="list-style-type: none"> • Deterioration of air quality • Soil erosion • Surface water contamination by wind erosion 	<ul style="list-style-type: none"> • Ensure sprinkling of water on excavated material and unpaved roads • Excavated material will be used for refilling the excavation sites. • Excavated or stockpiled soil and sand shall be slightly wetted before loading, particularly in windy conditions. • Vehicles transporting soil, sand and other construction materials shall be covered. Speeds of such vehicles shall be limited on unpaved areas. • Transporting materials through densely populated areas will be avoided. • Open areas of the sites and nearby roads (50m adjacent either side of the active works areas) shall be sprayed at least twice per day with water to suppress dust. 	<ul style="list-style-type: none"> • Visual inspection • Monitoring Particulate Matter PM₁₀ 	<ul style="list-style-type: none"> • Daily monitoring • Fortnightly monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	<p>USD \$ 500</p>
--	---	--	--	---	---	-------------------

²² Project routing does not envisaged any archeological site, however in case of any chance find the ***“Chance Find Procedures”*** should be adopted which is attached as Annexure – V of this EDF

	<ul style="list-style-type: none"> • Site overburden 	<ul style="list-style-type: none"> • Wind direction will be considered while selecting sites for stock piles. • Stockpiles of overburden shall be kept covered where possible. • Proper disposal of waste material. 	<ul style="list-style-type: none"> • Visual inspections • Monitoring Particulate Matter PM₁₀ 	<ul style="list-style-type: none"> • Daily monitoring • Fortnightly monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	USD \$ 500
	<ul style="list-style-type: none"> • Noise pollution 	<ul style="list-style-type: none"> • Equipment with high noise levels will be fitted with noise reduction devices • Regular inspection, maintenance and lubrication of the construction vehicle and equipment will be performed • Use of PPEs such as ear plugs and ear muffs by the workers will be ensured • Avoid night time activity 	<ul style="list-style-type: none"> • Monitoring compliance to NEQS for noise (SRO 72 (KE) / 2009) • The sampling will be done twice on monthly basis at 7m from the source. The duration of sampling will be 24 hours @ 15 seconds interval over 15 minutes every hour (averaged) 	<ul style="list-style-type: none"> • Fortnightly monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	USD \$ 400
	<ul style="list-style-type: none"> • Health and Safety issues 	<ul style="list-style-type: none"> • Fencing around excavations will be provided to reduce the risk of accidents. • Only trained staff will be allowed to operate machinery/ equipment • Avoid night time activity • Provide safety and warning signs 	<ul style="list-style-type: none"> • Monitor compliance by visual inspections 	<ul style="list-style-type: none"> • Daily monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring

Desilting and removal of vegetation from existing water storage pool #1 & 2.	<ul style="list-style-type: none"> • Soil and groundwater contamination • Land degradation due to waste disposal 	<ul style="list-style-type: none"> • Proper disposal of dredged material at designated landfill sites. • Adoption of good management practices to control soil and ground water contamination. • Ensure restoration of site to its original conditions after transferring the desilted material to the disposal site. 	<ul style="list-style-type: none"> • Monitor compliance by visual inspections 	<ul style="list-style-type: none"> • Daily monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
C. Operation & maintenance Phase						
Monitoring of water quantity supplied from the source (Kirthar Canal).	<ul style="list-style-type: none"> • Shortage of water supply 	<ul style="list-style-type: none"> • Both gravity and pumping system are present for extracting water from Kirthar Canal 	<ul style="list-style-type: none"> • Monitor discharge 	<ul style="list-style-type: none"> • Daily monitoring 	<ul style="list-style-type: none"> • NSUSC 	No budget is required for monitoring
Monitoring of water pollution at the source (Kirthar Canal).	<ul style="list-style-type: none"> • Water pollution 	<ul style="list-style-type: none"> • Continuous water monitoring will evaluate the pollution load on WFP. 	<ul style="list-style-type: none"> • Water quality will be tested as per WHO/ GOP standards. 	<ul style="list-style-type: none"> • Monthly monitoring 	<ul style="list-style-type: none"> • NSUSC 	USD \$ 1,000
Air pollution of diesel generator installed at low lift pumping station	<ul style="list-style-type: none"> • Air pollution • Health issues 	<ul style="list-style-type: none"> • Proper engine tuning generator to meet National Environmental Quality Standards of Pakistan limits and USEPA Tier 4 standards 2014 will be ensured. 	<ul style="list-style-type: none"> • Monitoring will be done on stack of machinery and equipment. The parameters required to be monitored are Smoke, H₂S, SO_x, CO, VOCs and NO_x. 	<ul style="list-style-type: none"> • Monthly monitoring 	<ul style="list-style-type: none"> • NSUSC 	USD \$ 1,000

Noise pollution due to pumps and diesel generator at low lift pumping station	<ul style="list-style-type: none"> Noise pollution Health issues 	<ul style="list-style-type: none"> Equipment with high noise levels will be fitted with noise reduction devices Regular inspection, maintenance and lubrication of the construction vehicle and equipment will be performed Use of PPEs such as ear plugs and ear muffs by the workers will be ensured Avoid night time activity 	<ul style="list-style-type: none"> Monitoring compliance to NEQS for noise (SRO 72 (KE) / 2009) The sampling will be done twice on monthly basis at 7m from the source. The duration of sampling will be 24 hours @ 15 seconds interval over 15 minutes every hour (averaged) 	<ul style="list-style-type: none"> Fortnightly monitoring 	<ul style="list-style-type: none"> NSUSC 	USD \$ 400
Fire hazard at pump room and diesel generator building at low lift pumping station	<ul style="list-style-type: none"> Health & safety issue Structural damage of pump room and generator building Impairment of pumps and generator 	<ul style="list-style-type: none"> Proper O&M practices should be adopted to avoid short circuiting. Provide and maintain adequate number of fire extinguishers 	<ul style="list-style-type: none"> Monitor the expiry of fire extinguisher and use class C type fire extinguisher as per OSHA's standards. 	<ul style="list-style-type: none"> Monthly monitoring 	<ul style="list-style-type: none"> NSUSC 	No budget is required for monitoring
Health and safety issues due to operation and maintenance activity at low lift pumping station	<ul style="list-style-type: none"> Health & safety issues 	<ul style="list-style-type: none"> Use of PPEs such as ear plugs, gloves, eye goggles, rubber boots, etc. by the workers will be ensured Staff & worker responsible for O&M will be adequately trained and only trained personal will be allowed for the job. Necessary first aid arrangements in case of any accident will be provided at the site. 	<ul style="list-style-type: none"> Monitor Compliance 	<ul style="list-style-type: none"> During activity 	<ul style="list-style-type: none"> NSUSC 	No budget is required for monitoring

Removal of vegetation and desilting from water storage pool #1&2.	<ul style="list-style-type: none"> • Soil and groundwater contamination • Land degradation due to waste disposal 	<ul style="list-style-type: none"> • Proper disposal of dredged material at designated landfill sites. • Adoption of good management practices to control soil and ground water contamination. • Ensure restoration of site to its original conditions after transferring the desilted material to the disposal site. 	<ul style="list-style-type: none"> • Monitor compliance by visual inspections 	<ul style="list-style-type: none"> • Daily monitoring 	<ul style="list-style-type: none"> • NSUSC 	No budget is required for monitoring
COMPONENT-2: CONSTRUCTION OF NEW WATER POOL						
B. Construction and Procurement Phase						

<p>Excavation works for Water Storage Pool#3.²³</p>	<ul style="list-style-type: none"> • Deterioration of air quality • Soil erosion • Surface water contamination by wind erosion 	<ul style="list-style-type: none"> • Ensure sprinkling of water on excavated material and unpaved roads • Excavated material will be used for refilling the excavation sites. • Excavated or stockpiled soil and sand shall be slightly wetted before loading, particularly in windy conditions. • Vehicles transporting soil, sand and other construction materials shall be covered. Speeds of such vehicles shall be limited on unpaved areas. • Open areas of the sites and nearby roads (50m adjacent either side of the active works areas) shall be sprayed at least twice per day with water to suppress dust. 	<ul style="list-style-type: none"> • Visual inspection • Monitoring Particulate Matter PM₁₀ 	<ul style="list-style-type: none"> • Daily monitoring • Fortnightly monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	<p>USD \$ 500</p>
---	---	---	--	---	---	-------------------

²³Project routing does not envisaged any archeological site, however in case of any chance find the ***“Chance Find Procedures”*** should be adopted which is attached as Annexure – V of this EDF

	<ul style="list-style-type: none"> • Site overburden 	<ul style="list-style-type: none"> • Wind direction will be considered while selecting sites for stock piles. • Stockpiles of overburden shall be kept covered where possible. • Proper disposal of waste material. 	<ul style="list-style-type: none"> • Visual inspections • Monitoring Particulate Matter PM₁₀ 	<ul style="list-style-type: none"> • Daily monitoring • Fortnightly monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	USD \$ 500
	<ul style="list-style-type: none"> • Noise pollution 	<ul style="list-style-type: none"> • Equipment with high noise levels will be fitted with noise reduction devices • Regular inspection, maintenance and lubrication of the construction vehicle and equipment will be performed • Use of PPEs such as ear plugs and ear muffs by the workers will be ensured • Avoid night time activity 	<ul style="list-style-type: none"> • Monitoring compliance to NEQS for noise (SRO 72 (KE) / 2009) • The sampling will be done twice on monthly basis at 7m from the source. The duration of sampling will be 24 hours @ 15 seconds interval over 15 minutes every hour (averaged) 	<ul style="list-style-type: none"> • Fortnightly monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	USD \$ 400
	<ul style="list-style-type: none"> • Health and Safety issues 	<ul style="list-style-type: none"> • Fencing around excavations will be provided to reduce the risk of accidents. • Only trained staff will be allowed to operate machinery/ equipment • Avoid night time activity • Provide safety and warning signs 	<ul style="list-style-type: none"> • Monitor compliance by visual inspections 	<ul style="list-style-type: none"> • Daily monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
C. Operation and Maintenance Phase						

Removal of vegetation and desilting from water storage pool #3.	<ul style="list-style-type: none"> • Soil and groundwater contamination • Land degradation due to waste disposal 	<ul style="list-style-type: none"> • Proper disposal of dredged material at designated landfill sites. • Adoption of good management practices to control soil and ground water contamination. • Ensure restoration of site to its original conditions after transferring the desilted material to the disposal site. 	<ul style="list-style-type: none"> • Monitor compliance by visual inspections 	<ul style="list-style-type: none"> • Daily monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • NSUSC 	No budget is required for monitoring
COMPONENT-3: PUMPING CAPACITY ENHANCEMENT						
A. Design and Planning Phase						
Design of new water distribution main from high lift pumping station to water filtration plant and its alignment.	<ul style="list-style-type: none"> • Environmental and social impacts due to Water distribution mains alignment design. 	<ul style="list-style-type: none"> • Rising main alignment is done in such manner that necessary utilities will be made available to avoid any interruption of utility services. Footbridges and overpasses to be included in mobilization/preparation work to avoid severance of pedestrian access. Where required, temporary arrangement will be made available to avoid any interruption of utility services. 	<ul style="list-style-type: none"> • Monitor compliance 	<ul style="list-style-type: none"> • Monitoring during design phase 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
Probability of electricity failure	<ul style="list-style-type: none"> • Shutdown of water supply 	<ul style="list-style-type: none"> • Standby generator at high lift pumping station 	<ul style="list-style-type: none"> • Monitor compliance • Design document & drawings 	<ul style="list-style-type: none"> • Monitoring during design phase 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring

Selection of Genset as per the required load	<ul style="list-style-type: none"> • Impairment of generators • Use of excessive fuel 	<ul style="list-style-type: none"> • 900 kVA standby generator at high lift pumping station 	<ul style="list-style-type: none"> • Monitor compliance • Design document & drawings 	<ul style="list-style-type: none"> • Monitoring during design phase 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
B. Construction and Procurement Phase						
Establishment of Campsite and Machinery/ Equipment Yard	<ul style="list-style-type: none"> • Changes in land use pattern • Social conflicts 	<ul style="list-style-type: none"> • Site for camp site shall be selected keeping in view the cultural norms of the area to avoid undue interference of the contractor's staff with the local residents. • Local residents will be given priority in the employment opportunities generated during construction and operations phase • The land will be rented for the camp site and equipment yard. No resettlement is envisaged for this purpose. 	<ul style="list-style-type: none"> • Monthly rent receipts. • Development & implementation of policy on local employments • 	<ul style="list-style-type: none"> • Strict compliance monitoring on monthly basis • Quarterly Reporting 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring

	<ul style="list-style-type: none"> • Workshop facilities will spread oils & chemicals 	<ul style="list-style-type: none"> • Proper disposal of used oil and chemical waste in accordance with MSDS will be ensured. • Efficient Use of Chemicals will be ensured. • Good housekeeping practices will be ensured at workshop areas. • Mixing of waste into fresh water sources will not be allowed. 	<ul style="list-style-type: none"> • Visual inspection 	<ul style="list-style-type: none"> • Daily monitoring • Monthly monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
	<ul style="list-style-type: none"> • Deterioration of air quality due to machinery & equipment 	<ul style="list-style-type: none"> • Proper engine tuning of machinery/ equipment to meet National Environmental Quality Standards of Pakistan limits and USEPA Tier 4 standards 2014 will be ensured. 	<ul style="list-style-type: none"> • Monitoring will be done on stack of machinery and equipment. The parameters required to be monitored are Smoke, H₂S, SO_x, CO, VOCs and NO_x. 	<ul style="list-style-type: none"> • Monthly monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	USD \$ 1,000
	<ul style="list-style-type: none"> • Noise 	<ul style="list-style-type: none"> • Equipment with high levels will be fitted with noise reduction devices • Regular inspection, maintenance and lubrication of the construction vehicle and equipment will be performed • Use of PPEs such as ear plugs and ear muffs by the workers will be ensured • Avoid night time activity 	<ul style="list-style-type: none"> • Monitoring compliance to NEQS for noise (SRO 72 (KE) / 2009) • The sampling will be done twice on monthly basis at 7m from the source. The duration of sampling will be 24 hours @ 15 seconds interval over 15 minutes every hour (averaged) 	<ul style="list-style-type: none"> • Fortnightly monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	USD \$ 400

	<ul style="list-style-type: none"> • Land degradation due to solid waste disposal of camp site 	<ul style="list-style-type: none"> • Ensure proper disposal of camp site waste at designated landfill sites. • Good housekeeping practices within the camp site will be adopted to minimize waste generation. • Disposal of campsite waste near residential colonies or in agricultural fields will not be allowed 	<ul style="list-style-type: none"> • Visual inspection 	<ul style="list-style-type: none"> • Weekly monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
--	---	---	---	--	---	--------------------------------------

<p>Excavation works for 600 mm dia carbon steel rising main²⁴</p>	<ul style="list-style-type: none"> • Deterioration of air quality • Soil erosion 	<ul style="list-style-type: none"> • Ensure sprinkling of water on excavated material and unpaved roads • Excavated material will be used for refilling the excavation sites. • Excavated or stockpiled soil and sand shall be slightly wetted before loading, particularly in windy conditions. • Vehicles transporting soil, sand and other construction materials shall be covered. Speeds of such vehicles shall be limited on unpaved areas. • Transporting materials through densely populated areas will be avoided. • Open areas of the sites and nearby roads (50m adjacent either side of the active works areas) shall be sprayed at least twice per day with water to suppress dust. 	<ul style="list-style-type: none"> • Visual inspection • Monitoring Particulate Matter PM₁₀ 	<ul style="list-style-type: none"> • Daily monitoring • Fortnightly monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	<p>USD \$ 500</p>
--	--	--	--	---	---	-------------------

²⁴ Project routing does not envisage any archeological site, however in case of any chance find the **“Chance Find Procedures”** should be adopted which is attached as Annexure – V of this EDF

	<ul style="list-style-type: none"> • Site overburden 	<ul style="list-style-type: none"> • Wind direction will be considered while selecting sites for stock piles. • Stockpiles of overburden shall be kept covered where possible. • Proper disposal of waste material. 	<ul style="list-style-type: none"> • Visual inspections • Monitoring Particulate Matter PM₁₀ 	<ul style="list-style-type: none"> • Daily monitoring • Fortnightly monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	USD \$ 500
	<ul style="list-style-type: none"> • Noise pollution 	<ul style="list-style-type: none"> • Equipment with high noise levels will be fitted with noise reduction devices • Regular inspection, maintenance and lubrication of the construction vehicle and equipment will be performed • Use of PPEs such as ear plugs and ear muffs by the workers will be ensured • Avoid night time activity 	<ul style="list-style-type: none"> • Monitoring compliance to NEQS for noise (SRO 72 (KE) / 2009) • The sampling will be done twice on monthly basis at 7m from the source. The duration of sampling will be 24 hours @ 15 seconds interval over 15 minutes every hour (averaged) 	<ul style="list-style-type: none"> • Fortnightly monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	USD \$ 400
	<ul style="list-style-type: none"> • Health and Safety issues 	<ul style="list-style-type: none"> • Fencing around excavations will be provided to reduce the risk of accidents. • Only trained staff will be allowed to operate machinery/ equipment • Avoid night time activity • Provide safety and warning signs 	<ul style="list-style-type: none"> • Monitor compliance by visual inspections 	<ul style="list-style-type: none"> • Daily monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring

Laying of 20.75 km long 600 mm dia carbon steel rising main.	<ul style="list-style-type: none"> • Interruption of utility services • Severance of pedestrian and vehicle access 	<ul style="list-style-type: none"> • Approvals from concerned local authorities will be obtained before starting excavation activity. • Consultation with the Utilities to obtain existing maps before finalization of the pipeline route 	<ul style="list-style-type: none"> • Visual inspections during laying work 	<ul style="list-style-type: none"> • Daily monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
C. Operation and Maintenance Phase						
Monitoring of water quantity supplied from high lift pumping station.	<ul style="list-style-type: none"> • Shortage of water supply and operational problems in water filtration plant 	<ul style="list-style-type: none"> • Ensure the water quantity supplied will be as per design 	<ul style="list-style-type: none"> • Monitor discharge 	<ul style="list-style-type: none"> • Daily monitoring 	<ul style="list-style-type: none"> • NSUSC 	No budget is required for monitoring
Air pollution of diesel generator installed at high lift pumping station	<ul style="list-style-type: none"> • Air pollution • Health issues 	<ul style="list-style-type: none"> • Proper engine tuning generator to meet National Environmental Quality Standards of Pakistan limits and USEPA Tier 4 standards 2014 will be ensured. 	<ul style="list-style-type: none"> • Monitoring will be done on stack of machinery and equipment. The parameters required to be monitored are Smoke, H₂S, SO_x, CO, VOCs and NO_x. 	<ul style="list-style-type: none"> • Monthly monitoring 	<ul style="list-style-type: none"> • NSUSC 	USD \$ 1,000

Noise pollution due to pumps and diesel generator at high lift pumping station	<ul style="list-style-type: none"> Noise pollution Health issues 	<ul style="list-style-type: none"> Equipment with high noise levels will be fitted with noise reduction devices Regular inspection, maintenance and lubrication of the construction vehicle and equipment will be performed Use of PPEs such as ear plugs and ear muffs by the workers will be ensured Avoid night time activity 	<ul style="list-style-type: none"> Monitoring compliance to NEQS for noise (SRO 72 (KE) / 2009) The sampling will be done twice on monthly basis at 7m from the source. The duration of sampling will be 24 hours @ 15 seconds interval over 15 minutes every hour (averaged) 	<ul style="list-style-type: none"> Fortnightly monitoring 	<ul style="list-style-type: none"> NSUSC 	USD \$ 400
Fire hazard at pump room and diesel generator building at high lift pumping station	<ul style="list-style-type: none"> Health & safety issues Structural damage of pump room and generator building Impairment of pumps and generator 	<ul style="list-style-type: none"> Proper O&M practices should be adopted to avoid short circuiting. Provide and maintain adequate number of fire extinguishers 	<ul style="list-style-type: none"> Monitor the expiry of fire extinguisher and use class C type fire extinguisher as per OSHA's standards. 	<ul style="list-style-type: none"> Monthly monitoring 	<ul style="list-style-type: none"> NSUSC 	No budget is required for monitoring
Health and safety issues due to operation and maintenance activity at high lift pumping station	<ul style="list-style-type: none"> Health & safety issues 	<ul style="list-style-type: none"> Use of PPEs such as ear plugs, gloves, eye goggles, rubber boots, etc. by the workers will be ensured Staff & worker responsible for O&M will be adequately trained and only trained personal will be allowed for the job. Necessary first aid arrangements in case of any accident will be provided at the site. 	<ul style="list-style-type: none"> Monitor Compliance 	<ul style="list-style-type: none"> During activity 	<ul style="list-style-type: none"> NSUSC 	No budget is required for monitoring

Maintenance of air release valves in rising mains	<ul style="list-style-type: none"> • Lack of maintenance will cause loss of water and impairment of rising main 	<ul style="list-style-type: none"> • Ensure the proper maintenance of air release valves 	<ul style="list-style-type: none"> • Visual inspection 	<ul style="list-style-type: none"> • Monthly monitoring 	<ul style="list-style-type: none"> • NSUSC 	No budget is required for monitoring
Illegal water connections in rising mains	<ul style="list-style-type: none"> • Loss of pressure in rising main • Impairment of rising main 	<ul style="list-style-type: none"> • Periodic surveillance & monitoring 	<ul style="list-style-type: none"> • Surveillance & Monitoring 	<ul style="list-style-type: none"> • Monthly monitoring 	<ul style="list-style-type: none"> • NSUSC 	No budget is required for monitoring
COMPONENT-5: PUMPING & TRANSMISSION SYSTEM LOOP TO OVERHEAD WATER TANKS						
A. Design and Planning Phase						
Design of new Rising Main (Carbon Steel) 600 mm dia from water filtration plant to overhead tanks	<ul style="list-style-type: none"> • Interruption of utility services • Severance of pedestrian access • Traffic congestion • Buffer distance to sensitive receivers to prevent nuisance and achieve safety criteria. 	<ul style="list-style-type: none"> • Rising main alignment is done in such manner that necessary utilities will be made available to avoid any interruption of utility services. Temporary passage way will be made available to avoid severance of pedestrian and traffic access. 	<ul style="list-style-type: none"> • Monitor compliance 	<ul style="list-style-type: none"> • Monitoring during design phase 	<ul style="list-style-type: none"> • Executed by AAA Team • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
Probability of electricity failure	<ul style="list-style-type: none"> • Shutdown of water supply 	<ul style="list-style-type: none"> • Standby generator at water filtration plant 	<ul style="list-style-type: none"> • Monitor compliance • Design document & drawings 	<ul style="list-style-type: none"> • Monitoring during design phase 	<ul style="list-style-type: none"> • Executed by AAA Team • Monitoring & Reporting by AAA Team and USAID community consultants 	No budget is required for monitoring
Selection of Genset as per the required load	<ul style="list-style-type: none"> • Impairment of generators • Use of excessive fuel 	<ul style="list-style-type: none"> • 300 kVA standby generator at water filtration plant 	<ul style="list-style-type: none"> • Monitor compliance • Design document & drawings 	<ul style="list-style-type: none"> • Monitoring during design phase 	<ul style="list-style-type: none"> • Executed by AAA Team • Monitoring & Reporting by AAA Team and USAID community consultants 	No budget is required for monitoring

Public consultation and sharing of proposed design considerations	<ul style="list-style-type: none"> • Social issues 	<ul style="list-style-type: none"> • The design engineering team will have to conduct various public & stakeholder consultation session, in order to have public opinion and recommendations on design of water supply system. 	<ul style="list-style-type: none"> • Monitor compliance • Design document & drawings 	<ul style="list-style-type: none"> • Monitoring during design phase 	<ul style="list-style-type: none"> • Executed by AAA Team • Monitoring & Reporting by AAA Team and USAID community consultants 	No budget is required for monitoring
B. Construction and Procurement Phase						
Establishment of Campsite and Machinery/ Equipment Yard	<ul style="list-style-type: none"> • Changes in land use pattern • Social conflicts 	<ul style="list-style-type: none"> • Site for camp site shall be selected keeping in view the cultural norms of the area to avoid undue interference of the contractor's staff with the local residents. • Local residents will be given priority in the employment opportunities generated during construction and operations phase • The land will be rented for the camp site and equipment yard. No resettlement is envisaged for this purpose. 	<ul style="list-style-type: none"> • Monthly rent receipts. • Development & implementation of policy on local employments • 	<ul style="list-style-type: none"> • Strict compliance monitoring on monthly basis • Quarterly Reporting 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring

	<ul style="list-style-type: none"> • Workshop facilities will spread oils & chemicals 	<ul style="list-style-type: none"> • Proper disposal of used oil and chemical waste in accordance with MSDS will be ensured. • Efficient Use of Chemicals will be ensured. • Good housekeeping practices will be ensured at workshop areas. • Mixing of waste into fresh water sources will not be allowed. 	<ul style="list-style-type: none"> • Visual inspection 	<ul style="list-style-type: none"> • Daily monitoring • Quarterly Reporting 	Monitoring by AAA Team and EMMP implementation reporting to USAID COR	No budget is required for monitoring
	<ul style="list-style-type: none"> • Deterioration of air quality due to machinery & equipment 	<ul style="list-style-type: none"> • Proper engine tuning of machinery/ equipment to meet National Environmental Quality Standards of Pakistan limits and USEPA Tier 4 standards 2014 will be ensured. 	<ul style="list-style-type: none"> • Monitoring will be done on stack of machinery and equipment. The parameters required to be monitored are Smoke, H₂S, SO_x, CO, VOCs and NO_x. 	<ul style="list-style-type: none"> • Monthly monitoring • Quarterly Reporting 	Monitoring by AAA Team and EMMP implementation reporting to USAID COR	USD \$ 1,000
	<ul style="list-style-type: none"> • Noise 	<ul style="list-style-type: none"> • Equipment with high levels will be fitted with noise reduction devices • Regular inspection, maintenance and lubrication of the construction vehicle and equipment will be performed • Use of PPEs such as ear plugs and ear muffs by the workers will be ensured • Avoid night time activity 	<ul style="list-style-type: none"> • Monitoring compliance to NEQS for noise (SRO 72 (KE) / 2009) <p>The sampling will be done twice on monthly basis at 7m from the source. The duration of sampling will be 24 hours @ 15 seconds interval over 15 minutes every hour (averaged)</p>	<ul style="list-style-type: none"> • Fortnightly monitoring • Quarterly Reporting 	Monitoring by AAA Team and EMMP implementation reporting to USAID COR	USD \$ 400

	<ul style="list-style-type: none"> • Land degradation due to solid waste disposal of camp site 	<ul style="list-style-type: none"> • Ensure proper disposal of camp site waste at designated landfill sites. • Good housekeeping practices within the camp site will be adopted to minimize waste generation. • Disposal of campsite waste near residential colonies or in agricultural fields will not be allowed 	Visual inspection	<ul style="list-style-type: none"> • Weekly monitoring • Quarterly Reporting 	Monitoring by AAA Team and EMMP implementation reporting to USAID COR	No budget is required for monitoring
--	---	---	-------------------	--	---	--------------------------------------

<p>Deep excavation works of approx 2 m to 3 m for new Rising Main (Carbon Steel) 600 mm dia from water filtration plant to overhead tanks²⁵</p>	<ul style="list-style-type: none"> • Deterioration of air quality • Soil erosion 	<ul style="list-style-type: none"> • Ensure sprinkling of water on excavated material and unpaved roads • Excavated material will be used for refilling the excavation sites. • Excavated or stockpiled soil and sand shall be slightly wetted before loading, particularly in windy conditions. • Vehicles transporting soil, sand and other construction materials shall be covered. Speeds of such vehicles shall be limited on unpaved areas. • Transporting materials through densely populated areas will be avoided. • Open areas of the sites and nearby roads (50m adjacent either side of the active works areas) shall be sprayed at least twice per day with water to suppress dust. 	<ul style="list-style-type: none"> • Visual inspection • Monitoring Particulate Matter PM₁₀ 	<ul style="list-style-type: none"> • Daily monitoring • Fortnightly monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	<p>USD \$ 500</p>
---	--	--	--	---	---	-------------------

²⁵ Project routing does not envisaged any archeological site, however in case of any chance find the ***“Chance Find Procedures”*** should be adopted which is attached as Annexure – V of this EDF

	<ul style="list-style-type: none"> • Site overburden 	<ul style="list-style-type: none"> • Wind direction will be considered while selecting sites for stock piles. • Stockpiles of overburden shall be kept covered where possible. • Proper disposal of waste material. 	<ul style="list-style-type: none"> • Visual inspections • Monitoring Particulate Matter PM₁₀ 	<ul style="list-style-type: none"> • Daily monitoring • Fortnightly monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	USD \$ 500
--	---	--	---	---	---	------------

	<ul style="list-style-type: none"> Noise pollution 	<ul style="list-style-type: none"> Equipment with high noise levels will be fitted with noise reduction devices Regular inspection, maintenance and lubrication of the construction vehicle and equipment will be performed Use of PPEs such as ear plugs and ear muffs by the workers will be ensured Avoid night time activity Near religious areas and schools the contractor shall discuss with the school and religious area heads the agreed time for operating the noisy machines and completely avoid machine use near schools during examination times and near religious areas during religiously sensitive times. 	<ul style="list-style-type: none"> Monitoring compliance to NEQS for noise (SRO 72 (KE) / 2009) The sampling will be done twice on monthly basis at 7m from the source. The duration of sampling will be 24 hours @ 15 seconds interval over 15 minutes every hour (averaged) 	<ul style="list-style-type: none"> Fortnightly monitoring Quarterly Reporting 	<ul style="list-style-type: none"> Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	USD \$ 400
--	---	---	---	---	---	------------

	<ul style="list-style-type: none"> • Health and Safety issues • Chances of accidents due to deep excavation 	<ul style="list-style-type: none"> • Fencing around excavations will be provided to reduce the risk of accidents. • Only trained staff will be allowed to operate machinery/ equipment • Avoid night time activity • Provide safety and warning signs 	<ul style="list-style-type: none"> • Monitor compliance by visual inspections 	<ul style="list-style-type: none"> • Daily monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
	<ul style="list-style-type: none"> • Interruption of existing utility services 	<ul style="list-style-type: none"> • Approvals from concerned local authorities will be obtained before starting excavation activity. • Maps of existing utilities were consulted before finalizing new rising main to avoid damage to existing infrastructure. • Near religious areas and schools the contractor shall discuss with the school and religious area heads the agreed time for work and completely avoid works near schools during examination times and near religious areas during religiously sensitive times. 	<ul style="list-style-type: none"> • Visual inspections during laying work 	<ul style="list-style-type: none"> • Daily monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring

	<ul style="list-style-type: none"> • Traffic congestion due to excavation and stockpiling of excavated material 	<ul style="list-style-type: none"> • Scheduling for the construction activity will be done in consultation with local communities. • Proper demarcation of active site will be done during construction • Appropriate schedule will be developed for movement of vehicles in consultation with local people • Precautionary measures of construction will be communicated verbally and through signboards to local residence. • Submit temporary traffic management plan one month prior to start of works in any given sector. • Formulation and implementation of a construction related traffic management plan and assign traffic control personnel. 	<ul style="list-style-type: none"> • Monitor Compliance 	<ul style="list-style-type: none"> • Daily • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
--	--	--	--	--	---	--------------------------------------

<p>Laying of 6.7 km long new Rising Main (Carbon Steel) 600 mm dia from water filtration plant to overhead tanks</p>	<ul style="list-style-type: none"> • Interruption of utility services • Severance of pedestrian and vehicle access 	<ul style="list-style-type: none"> • Approvals from concerned local authorities will be obtained before starting excavation activity. • Maps of existing utilities were consulted before finalizing new rising main to avoid damage to existing infrastructure. • Near religious areas and schools the contractor shall discuss with the school and religious area heads the agreed time for operating the machines and completely avoid machine use near schools during examination times and near religious areas during religiously sensitive times. 	<ul style="list-style-type: none"> • Visual inspections during laying work 	<ul style="list-style-type: none"> • Daily monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	<p>No budget is required for monitoring</p>
---	--	--	---	---	---	---

	<ul style="list-style-type: none"> Traffic congestion 	<ul style="list-style-type: none"> Scheduling for the construction activity will be done in consultation with local communities. Proper demarcation of active site will be done during construction Appropriate schedule will be developed for movement of vehicles in consultation with local people Precautionary measures of construction will be communicated verbally and through signboards to local residence. Submit temporary traffic management plan one month prior to start of works in any given sector. Formulation and implementation of a construction related traffic management plan and assign traffic control personnel. 	<ul style="list-style-type: none"> Monitor Compliance 	<ul style="list-style-type: none"> Daily monitoring Quarterly Reporting 	<ul style="list-style-type: none"> Execution by construction contractor Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
C. Operation and Maintenance Phase						
Monitoring of water quantity and quality	<ul style="list-style-type: none"> Shortage of water supply 	<ul style="list-style-type: none"> Ensure the water quantity supplied will be as per design 	<ul style="list-style-type: none"> Monitor discharge 	<ul style="list-style-type: none"> Daily monitoring 	<ul style="list-style-type: none"> NSUSC 	No budget is required for monitoring

supplied from water filtration plant pumping station.	<ul style="list-style-type: none"> • Health issues • Social Issues 	<ul style="list-style-type: none"> • Water testing laboratory which already exists will be rehabilitated for performing water quality testing. • Water quality will be tested as per WHO/ GOP standards to ensure the integrity of the water supply system. • Turbidity and free residual chlorine tests shall be regularly performed. • Consider to maintain residual chlorine in distribution water at 0.4 to 0.5 mg/l as to prevent growth of nuisance bacteria. • If the applicable standards are not met, adequate mitigation measures to ensure that the water supply is fit for drinking. 	<ul style="list-style-type: none"> • WHO/ GOP Drinking Water Standards 	<ul style="list-style-type: none"> • Reliability of water supply source • Daily monitoring of turbidity and free residual chlorine test • Analysis of water quality parameters on Weekly basis • Monthly analysis of water quality parameters from third party laboratory 	<ul style="list-style-type: none"> • NSUSC 	USD \$ 1,000
Air pollution of diesel generator installed at water filtration plant.	<ul style="list-style-type: none"> • Air pollution • Health issues 	<ul style="list-style-type: none"> • Proper engine tuning generator to meet National Environmental Quality Standards of Pakistan limits and USEPA Tier 4 standards 2014 will be ensured. 	<ul style="list-style-type: none"> • Monitoring will be done on stack of machinery and equipment. The parameters required to be monitored are Smoke, H₂S, SO_x, CO, VOCs and NO_x. 	<ul style="list-style-type: none"> • Monthly monitoring 	<ul style="list-style-type: none"> • NSUSC 	USD \$ 1,000

Noise pollution due to pumps and diesel generator at water filtration plant.	<ul style="list-style-type: none"> Noise pollution Health issues 	<ul style="list-style-type: none"> Equipment with high noise levels will be fitted with noise reduction devices Regular inspection, maintenance and lubrication of the construction vehicle and equipment will be performed Use of PPEs such as ear plugs and ear muffs by the workers will be ensured Avoid night time activity 	<ul style="list-style-type: none"> Monitoring compliance to NEQS for noise (SRO 72 (KE) / 2009) The sampling will be done twice on monthly basis at 7m from the source. The duration of sampling will be 24 hours @ 15 seconds interval over 15 minutes every hour (averaged) 	<ul style="list-style-type: none"> Fortnightly monitoring 	<ul style="list-style-type: none"> NSUSC 	USD \$ 400
Fire hazard at pump room and diesel generator building at water filtration plant.	<ul style="list-style-type: none"> Health & safety issues Structural damage of pump room and generator building Impairment of pumps and generator 	<ul style="list-style-type: none"> Proper O&M practices should be adopted to avoid short circuiting. Provide and maintain adequate number of fire extinguishers 	<ul style="list-style-type: none"> Monitor the expiry of fire extinguisher and use class C type fire extinguisher as per OSHA's standards. 	<ul style="list-style-type: none"> Monthly monitoring 	<ul style="list-style-type: none"> NSUSC 	No budget is required for monitoring
Health and safety issues due to operation and maintenance activity of pumps and diesel generator installed at water filtration plant.	<ul style="list-style-type: none"> Health & safety issues 	<ul style="list-style-type: none"> Use of PPEs such as ear plugs, gloves, eye goggles, rubber boots, etc. by the workers will be ensured Staff & worker responsible for O&M will be adequately trained and only trained personal will be allowed for the job. Necessary first aid arrangements in case of any accident will be provided at the site. 	<ul style="list-style-type: none"> Monitor Compliance 	<ul style="list-style-type: none"> During activity 	<ul style="list-style-type: none"> NSUSC 	No budget is required for monitoring

Illegal water connections in new rising main and distribution pipe to all six Overhead Water Tanks	<ul style="list-style-type: none"> • Loss of pressure in rising main • Impairment of rising main 	<ul style="list-style-type: none"> • Periodic surveillance & monitoring 	<ul style="list-style-type: none"> • Surveillance & Monitoring 	<ul style="list-style-type: none"> • Monthly monitoring 	<ul style="list-style-type: none"> • NSUSC 	No budget is required for monitoring
COMPONENT-6: ZONE WISE WATER DISTRIBUTION SYSTEM & CONSTRUCTION OF OVERHEAD WATER TANKS						
A. Design and Planning Phase						
Design considerations for disruption of existing water supply services	<ul style="list-style-type: none"> • Social issues 	<ul style="list-style-type: none"> • New and separate water supply network will be installed and the old network will remain buried. 	<ul style="list-style-type: none"> • Monitor compliance • Design document & drawings 	<ul style="list-style-type: none"> • Monitoring during design phase 	<ul style="list-style-type: none"> • Executed by AAA Team • Monitoring & Reporting by AAA Team and USAID community consultants 	No budget is required for monitoring
Design considerations to prevent the risk of contamination of sewage into water supply	<ul style="list-style-type: none"> • Water pollution • Health issues • Social issues 	<ul style="list-style-type: none"> • The design will prevent the contamination of sewage in water supply as all the water supply lines, at crossings from the sewerage drains, are sleeved with carbon steel and the space between the pipe and sleeve is filled with cement concrete (CC) at the time of construction. However, monitoring and surveillance is required. 	<ul style="list-style-type: none"> • Monitor compliance • Design document & drawings 	<ul style="list-style-type: none"> • Monitoring during design phase 	<ul style="list-style-type: none"> • Executed by AAA Team • Monitoring & Reporting by AAA Team and USAID community consultants 	No budget is required for monitoring

Design considerations for meeting the daily demand of water supply	<ul style="list-style-type: none"> • Social issues 	<ul style="list-style-type: none"> • The project ensures 100% water connections to users • For remote areas outside the city stand posts will be provided for water supply. One stand post will serve 8-10 houses. 	<ul style="list-style-type: none"> • Monitor compliance • Design document & drawings 	<ul style="list-style-type: none"> • Monitoring during design phase 	<ul style="list-style-type: none"> • Executed by AAA Team • Monitoring & Reporting by AAA Team and USAID community consultants 	No budget is required for monitoring
Probability of electricity failure	<ul style="list-style-type: none"> • Shutdown of water supply 	<ul style="list-style-type: none"> • Standby generator at water filtration plant 	<ul style="list-style-type: none"> • Monitor compliance • Design document & drawings 	<ul style="list-style-type: none"> • Monitoring during design phase 	<ul style="list-style-type: none"> • Executed by AAA Team • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
Design considerations for traffic congestion due laying of water distribution network	<ul style="list-style-type: none"> • Traffic congestion • Social issues 	<ul style="list-style-type: none"> • Formulation and implementation of a construction related traffic management plan and assign traffic control personnel. 	<ul style="list-style-type: none"> • Monitor compliance • Design document 	<ul style="list-style-type: none"> • Monitoring during design phase 	<ul style="list-style-type: none"> • Executed by AAA Team • Monitoring & Reporting by AAA Team and USAID community consultants 	No budget is required for monitoring
Public consultation and sharing of proposed design considerations	<ul style="list-style-type: none"> • Social issues 	<ul style="list-style-type: none"> • The design engineering team will have to conduct various public & stakeholder consultation session, in order to have public opinion and recommendations on design of water supply system. 	<ul style="list-style-type: none"> • Monitor compliance • Design document & drawings 	<ul style="list-style-type: none"> • Monitoring during design phase 	<ul style="list-style-type: none"> • Executed by AAA Team • Monitoring & Reporting by AAA Team and USAID community consultants 	No budget is required for monitoring
B. Construction and Procurement Phase						

Establishment of Campsite and Machinery/ Equipment Yard	<ul style="list-style-type: none"> • Changes in land use pattern • Social conflicts 	<ul style="list-style-type: none"> • Site for camp site shall be selected keeping in view the cultural norms of the area to avoid undue interference of the contractor's staff with the local residents. • Local residents will be given priority in the employment opportunities generated during construction and operations phase • The land will be rented for the camp site and equipment yard. No resettlement is envisaged for this purpose. 	<ul style="list-style-type: none"> • Monthly rent receipts. • Development & implementation of policy on local employments • 	<ul style="list-style-type: none"> • Strict compliance monitoring on monthly basis • Quarterly Reporting 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
	<ul style="list-style-type: none"> • Workshop facilities will spread oils & chemicals 	<ul style="list-style-type: none"> • Proper disposal of used oil and chemical waste in accordance with MSDS will be ensured. • Efficient Use of Chemicals will be ensured. • Good housekeeping practices will be ensured at workshop areas. • Mixing of waste into fresh water sources will not be allowed. 	<ul style="list-style-type: none"> • Visual inspection • 	<ul style="list-style-type: none"> • Daily monitoring • Quarterly Reporting 	Monitoring by AAA Team and EMMP implementation reporting to USAID COR	No budget is required for monitoring

	<ul style="list-style-type: none"> Deterioration of air quality due to machinery & equipment 	<ul style="list-style-type: none"> Proper engine tuning of machinery/ equipment to meet National Environmental Quality Standards of Pakistan limits and USEPA Tier 4 standards 2014 will be ensured. 	<ul style="list-style-type: none"> Monitoring will be done on stack of machinery and equipment. The parameters required to be monitored are Smoke, H₂S, SO_x, CO, VOCs and NO_x. 	<ul style="list-style-type: none"> Monthly monitoring Quarterly Reporting 	Monitoring by AAA Team and EMMP implementation reporting to USAID COR	USD \$ 1,000
	<ul style="list-style-type: none"> Noise 	<ul style="list-style-type: none"> Equipment with high levels will be fitted with noise reduction devices Regular inspection, maintenance and lubrication of the construction vehicle and equipment will be performed Use of PPEs such as ear plugs and ear muffs by the workers will be ensured Avoid night time activity 	<ul style="list-style-type: none"> Monitoring compliance to NEQS for noise (SRO 72 (KE) / 2009) The sampling will be done twice on monthly basis at 7m from the source. The duration of sampling will be 24 hours @ 15 seconds interval over 15 minutes every hour (averaged) 	<ul style="list-style-type: none"> Fortnightly monitoring Quarterly Reporting 	Monitoring by AAA Team and EMMP implementation reporting to USAID COR	USD \$ 400
	<ul style="list-style-type: none"> Land degradation due to solid waste disposal of camp site 	<ul style="list-style-type: none"> Ensure proper disposal of camp site waste at designated landfill sites. Good housekeeping practices within the camp site will be adopted to minimize waste generation. Disposal of campsite waste near residential colonies or in agricultural fields will not be allowed 	Visual inspection	<ul style="list-style-type: none"> Weekly monitoring Quarterly Reporting 	Monitoring by AAA Team and EMMP implementation reporting to USAID COR	No budget is required for monitoring

<p>Excavation works for 350 mm HDPE pipe from all six Overhead Water Tanks to distribution network and 350 mm to 75 mm HDPE pipe for distribution network for zone1, zone2, zone3, zone4, zone5, and zone6.²⁶</p>	<ul style="list-style-type: none"> • Deterioration of air quality • Soil erosion 	<ul style="list-style-type: none"> • Ensure sprinkling of water on excavated material and unpaved roads • Excavated material will be used for refilling the excavation sites. • Excavated or stockpiled soil and sand shall be slightly wetted before loading, particularly in windy conditions. • Vehicles transporting soil, sand and other construction materials shall be covered. Speeds of such vehicles shall be limited on unpaved areas. • Transporting materials through densely populated areas will be avoided. • Open areas of the sites and nearby roads (50m adjacent either side of the active works areas) shall be sprayed at least twice per day with water to suppress dust. 	<ul style="list-style-type: none"> • Visual inspection • Monitoring Particulate Matter PM₁₀ 	<ul style="list-style-type: none"> • Daily monitoring • Fortnightly monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	<p>USD \$ 500</p>
--	--	--	--	---	---	-------------------

²⁶Project routing does not envisaged any archeological site, however in case of any chance find the ***“Chance Find Procedures”*** should be adopted which is attached as Annexure – V of this EDF

	<ul style="list-style-type: none"> • Site overburden 	<ul style="list-style-type: none"> • Wind direction will be considered while selecting sites for stock piles. • Stockpiles of overburden shall be kept covered where possible. • Proper disposal of waste material. 	<ul style="list-style-type: none"> • Visual inspections • Monitoring Particulate Matter PM₁₀ 	<ul style="list-style-type: none"> • Daily monitoring • Fortnightly monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	USD \$ 500
--	---	--	---	---	---	------------

	<ul style="list-style-type: none"> Noise pollution 	<ul style="list-style-type: none"> Equipment with high noise levels will be fitted with noise reduction devices Regular inspection, maintenance and lubrication of the construction vehicle and equipment will be performed Use of PPEs such as ear plugs and ear muffs by the workers will be ensured Avoid night time activity Near religious areas and schools the contractor shall discuss with the school and religious area heads the agreed time for operating the noisy machines and completely avoid machine use near schools during examination times and near religious areas during religiously sensitive times. 	<ul style="list-style-type: none"> Monitoring compliance to NEQS for noise (SRO 72 (KE) / 2009) The sampling will be done twice on monthly basis at 7m from the source. The duration of sampling will be 24 hours @ 15 seconds interval over 15 minutes every hour (averaged) 	<ul style="list-style-type: none"> Fortnightly monitoring Quarterly Reporting 	<ul style="list-style-type: none"> Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	USD \$ 400
--	---	---	---	---	---	------------

	<ul style="list-style-type: none"> • Health and Safety issues 	<ul style="list-style-type: none"> • Fencing around excavations will be provided to reduce the risk of accidents. • Only trained staff will be allowed to operate machinery/ equipment • Avoid night time activity • Provide safety and warning signs 	<ul style="list-style-type: none"> • Monitor compliance by visual inspections 	<ul style="list-style-type: none"> • Daily monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring and reporting by AAA-TCI 	No budget is required for monitoring
	<ul style="list-style-type: none"> • Interruption of existing utility services 	<ul style="list-style-type: none"> • Approvals from concerned local authorities will be obtained before starting excavation activity. • Maps of existing utilities were consulted before finalizing new rising main to avoid damage to existing infrastructure. • Near religious areas and schools the contractor shall discuss with the school and religious area heads the agreed time for work and completely avoid works near schools during examination times and near religious areas during religiously sensitive times. 	<ul style="list-style-type: none"> • Visual inspections during laying work 	<ul style="list-style-type: none"> • Daily monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring

	<ul style="list-style-type: none"> • Traffic congestion due to excavation and stockpiling of excavated material 	<ul style="list-style-type: none"> • Scheduling for the construction activity will be done in consultation with local communities. • Proper demarcation of active site will be done during construction • Appropriate schedule will be developed for movement of vehicles in consultation with local people • Precautionary measures of construction will be communicated verbally and through signboards to local residence. • Submit temporary traffic management plan one month prior to start of works in any given sector. • Formulation and implementation of a construction related traffic management plan and assign traffic control personnel. 	<ul style="list-style-type: none"> • Monitor Compliance 	<ul style="list-style-type: none"> • Daily • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
--	--	--	--	--	---	--------------------------------------

<p>Laying of 0.675 km long 350 mm dia HDPE pipe from all six Overhead Water Tanks to distribution network.</p>	<ul style="list-style-type: none"> • Interruption of utility services • Severance of pedestrian and vehicle access 	<ul style="list-style-type: none"> • Approvals from concerned local authorities will be obtained before starting excavation activity. • Maps of existing utilities were consulted before finalizing new rising main to avoid damage to existing infrastructure. • Near religious areas and schools the contractor shall discuss with the school and religious area heads the agreed time for work and completely avoid works near schools during examination times and near religious areas during religiously sensitive times. 	<ul style="list-style-type: none"> • Visual inspections during laying work 	<ul style="list-style-type: none"> • Daily monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	<p>No budget is required for monitoring</p>
---	--	--	---	---	---	---

	<ul style="list-style-type: none"> • Traffic congestion 	<ul style="list-style-type: none"> • Scheduling for the construction activity will be done in consultation with local communities. • Proper demarcation of active site will be done during construction • Appropriate schedule will be developed for movement of vehicles in consultation with local people • Precautionary measures of construction will be communicated verbally and through signboards to local residence. • Submit temporary traffic management plan one month prior to start of works in any given sector. • Formulation and implementation of a construction related traffic management plan and assign traffic control personnel. 	<ul style="list-style-type: none"> • Monitor Compliance 	<ul style="list-style-type: none"> • Daily • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
--	--	--	--	--	---	--------------------------------------

<p>Laying of 350 mm to 75 mm dia HDPE pipe for distribution network for zone1, zone2, zone3, zone4, zone5, and zone6.</p>	<ul style="list-style-type: none"> • Interruption of utility services • Severance of pedestrian and vehicle access 	<ul style="list-style-type: none"> • Approvals from concerned local authorities will be obtained before starting excavation activity. • Maps of existing utilities were consulted before finalizing new rising main to avoid damage to existing infrastructure. • Near religious areas and schools the contractor shall discuss with the school and religious area heads the agreed time for work and completely avoid works near schools during examination times and near religious areas during religiously sensitive times. 	<ul style="list-style-type: none"> • Visual inspections during laying work 	<ul style="list-style-type: none"> • Daily monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	<p>No budget is required for monitoring</p>
---	--	--	---	---	---	---

	<ul style="list-style-type: none"> • Traffic congestion 	<ul style="list-style-type: none"> • Scheduling for the construction activity will be done in consultation with local communities. • Proper demarcation of active site will be done during construction • Appropriate schedule will be developed for movement of vehicles in consultation with local people • Precautionary measures of construction will be communicated verbally and through signboards to local residence. • Submit temporary traffic management plan one month prior to start of works in any given sector. • Formulation and implementation of a construction related traffic management plan and assign traffic control personnel. 	<ul style="list-style-type: none"> • Monitor Compliance 	<ul style="list-style-type: none"> • Daily • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
--	--	--	--	--	---	--------------------------------------

<p>Construction of 25 m high water tank of 1,364 m³ for zone1 and 682 m³ for zone2, and 20 m high water tank of 1,000 m³ for zone3, 568 m³ for zone4, 750 m³ for zone5 and 1,137 m³ for zone6.</p>	<ul style="list-style-type: none"> • Air pollution due to construction activities 	<ul style="list-style-type: none"> • Ensure sprinkling of water on excavated material and unpaved roads • Excavated material will be used for refilling the excavation sites. • Excavated or stockpiled soil and sand shall be slightly wetted before loading, particularly in windy conditions. • Vehicles transporting soil, sand and other construction materials shall be covered. Speeds of such vehicles shall be limited on unpaved areas. • Transporting materials through densely populated areas will be avoided. • Open areas of the sites and nearby roads (50m adjacent either side of the active works areas) shall be sprayed at least twice per day with water to suppress dust. 	<ul style="list-style-type: none"> • Visual inspection • Monitoring Particulate Matter PM₁₀ 	<ul style="list-style-type: none"> • Daily monitoring • Fortnightly monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • AAA-TCI & Construction Contractor 	<p>USD \$ 2,000</p>
---	--	--	--	---	---	---------------------

	<ul style="list-style-type: none"> Noise Pollution due to construction activities 	<ul style="list-style-type: none"> Equipment with high noise levels will be fitted with noise reduction devices Regular inspection, maintenance and lubrication of the construction vehicle and equipment will be performed Use of PPEs such as ear plugs and ear muffs by the workers will be ensured Avoid night time activity Near religious areas and schools the contractor shall discuss with the school and religious area heads the agreed time for operating the noisy machines and completely avoid machine use near schools during examination times and near religious areas during religiously sensitive times. 	<ul style="list-style-type: none"> Monitoring compliance to NEQS for noise (SRO 72 (KE) / 2009) The sampling will be done twice on monthly basis at 7m from the source. The duration of sampling will be 24 hours @ 15 seconds interval over 15 minutes every hour (averaged) 	<ul style="list-style-type: none"> Fortnightly monitoring Quarterly Reporting 	<ul style="list-style-type: none"> AAA-TCI & Construction Contractor 	USD \$ 1,200
--	--	---	---	---	---	--------------

	<ul style="list-style-type: none"> • Chances of accidents due to construction activities 	<ul style="list-style-type: none"> • Fencing around excavations will be provided to reduce the risk of accidents. • Only trained staff will be allowed to operate machinery/ equipment • Avoid night time activity • Provide safety and warning signs 	<ul style="list-style-type: none"> • Monitor compliance by visual inspections 	<ul style="list-style-type: none"> • Daily monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
	<ul style="list-style-type: none"> • Interruption of existing utility services 	<ul style="list-style-type: none"> • Approvals from concerned local authorities will be obtained before starting excavation activity. • Maps of existing utilities were consulted before finalizing new rising main to avoid damage to existing infrastructure. • Near religious areas and schools the contractor shall discuss with the school and religious area heads the agreed time for work and completely avoid works near schools during examination times and near religious areas during religiously sensitive times. 	<ul style="list-style-type: none"> • Visual inspections during laying work 	<ul style="list-style-type: none"> • Daily monitoring • Quarterly Reporting 	<ul style="list-style-type: none"> • Execution by construction contractor • Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring

	<ul style="list-style-type: none"> Traffic congestion 	<ul style="list-style-type: none"> Scheduling for the construction activity will be done in consultation with local communities. Proper demarcation of active site will be done during construction Appropriate schedule will be developed for movement of vehicles in consultation with local people Precautionary measures of construction will be communicated verbally and through signboards to local residence. Submit temporary traffic management plan one month prior to start of works in any given sector. Formulation and implementation of a construction related traffic management plan and assign traffic control personnel. 	<ul style="list-style-type: none"> Monitor Compliance 	<ul style="list-style-type: none"> Daily Quarterly Reporting 	<ul style="list-style-type: none"> Execution by construction contractor Monitoring by AAA Team and EMMP implementation reporting to USAID COR 	No budget is required for monitoring
C. Operation and Maintenance Phase						
Monitoring of water quantity supplied.	<ul style="list-style-type: none"> Shortage of water supply 	<ul style="list-style-type: none"> Ensure the water quantity supplied will be as per design 	<ul style="list-style-type: none"> Monitor discharge 	<ul style="list-style-type: none"> Daily monitoring 	<ul style="list-style-type: none"> NSUSC 	No budget is required for monitoring

Monitoring of water pollution at each water tank delivery and end users	<ul style="list-style-type: none"> • Health issues • Social Issues 	<ul style="list-style-type: none"> • Water quality will be tested as per WHO/ GOP standards to ensure the integrity of the water supply system. • Turbidity and free residual chlorine tests shall be regularly performed. • Consider to maintain residual chlorine in distribution water at 0.4 to 0.5 mg/l as to prevent growth of nuisance bacteria. • If the applicable standards are not met, adequate mitigation measures to ensure that the water supply is fit for drinking. 	<ul style="list-style-type: none"> • WHO/ GOP Drinking Water Standards 	<ul style="list-style-type: none"> • Reliability of water supply source • Daily monitoring of turbidity and free residual chlorine test • Analysis of water quality parameters on Weekly basis • Monthly analysis of water quality parameters from third party laboratory 	<ul style="list-style-type: none"> • NSUSC 	USD \$ 1,000
Illegal water connections	<ul style="list-style-type: none"> • Loss of pressure in distribution network • Impairment of distribution network • Social issues 	<ul style="list-style-type: none"> • Periodic surveillance & monitoring 	<ul style="list-style-type: none"> • Surveillance & Monitoring 	<ul style="list-style-type: none"> • Monthly monitoring 	<ul style="list-style-type: none"> • NSUSC 	No budget is required for monitoring
Contamination of sewage in water supply	<ul style="list-style-type: none"> • Health issues • Social issues 	<ul style="list-style-type: none"> • Periodic surveillance & monitoring • Water quality will be tested at end user as per WHO/ GOP standards to ensure the integrity of the water supply system. 	<ul style="list-style-type: none"> • Surveillance & Monitoring • WHO/ GOP Drinking Water Standards 	<ul style="list-style-type: none"> • Monthly monitoring 	<ul style="list-style-type: none"> • NSUSC 	USD \$ 800
Total						USD \$ 23,800

	Cost	Remarks
Resident Engineer (per month)	Rs. 457,600	One day per month input
Construction Inspector (per month)	Rs. 193,050	Two days per month input
Environmental Engineer (per month)	Rs. 343,200	Ten days per month input
Average Duration Cost Per Month	Rs. 164,450	
Average Duration of Site	12 Months	
Total Cost Required	Rs. 1,973,400	

Cost includes sum of labor, travel & transportation, fringe, overhead fee and G&A

ANNEXURE – I: Approval of Additional Quantity of water supply in Kirthar Canal from Irrigation Department



GOVERNMENT OF SINDH
IRRIGATION DEPARTMENT

SUMMARY FOR CHIEF MINISTER

**SUBJECT: -IMPROVEMENT OF WATER SUPPLY AND SEWAGE SYSTEM
IN JACOBABAD UNDER USAID-SINDH MSDP.**

Honourable Chief Minister, Sindh may kindly peruse letter No. MSDP/PD/JCB-Irrigation/2013/64 dated 21.02.2013 from Program Director, Municipal Services Delivery Program (MSDP), P&D Department Government of Sindh, Karachi copy placed at **Flag “A”**

2. The Program Director, MSDP has requested for supply of irrigation water from Khirthar Canal for improvement of drinking water system for the city of Jacobabad carrying out under USAID-MSDP Program.

3. The Chief Engineer, Sukkur Barrage, Right Bank Region, Larkana after examining the request has submitted the report of Superintending Engineer, Saifullah Magsi Branch Circle, Larkana stated therein that site has been inspected by the Assistant Executive Engineer, Saifullah Magsi Branch Sub-Division No. 1, Ghari Khairo, who has proposed for sanction of new pipe outlet from Khirthar Branch at R.D 82.00 with the discharge of 15.33 cusecs to fulfill the demand for improvement of water supply of Urban Water Supply Scheme, Jacobabad phase-IV (Filtration) for drinking water in the best interest of Public of Jacobabad City. He has submitted the case for further necessary action as per government policy. Copy of his report is placed at **Flag “B”**

4. The case has been examined in the department. It is observed that the separate pipe outlet at R.D. 82.00 Ex. Khirthar Branch is proposed for supply of canal water for non-irrigation purpose for drinking purpose to the urban water supply scheme, Jacobabad phase-iv (Filtration) which is being carried out government of sindh and USAID under Municipal Services Delivery Program. The discharge of 15.33 cusecs will be required for the proposed separate pipe outlet. However, the instant proposal is for

supply of water for non-irrigation purpose for drinking purpose through proposed outlet, hence, the required discharge can be made available from Khirthar Branch for which the water rate for non-irrigation purpose for drinking purpose for the required discharge of 15.33 cusecs will be paid by the beneficiaries at the rate prescribed by the Government of Sindh, from time to time.

5. There is ban imposed on sanction of separate outlet imposed vide this department's letter No. 2/687-SO(OP)/70-Vol: III dated 02.01.1999. Copy placed at Flag "C".

6. Keeping in view the above facts, the department recommended for sanction of a separate pipe outlet at R.D. 82.00 Ex. Khirthar Branch with the discharge of 15.33 cusecs for supply canal water for non-irrigation purpose for drinking purpose to the urban water supply scheme Jacobabad phase-iv (Filtration).

7. Honourable Chief Minister is requested to kindly approve recommendations of the department at para-6 above in relaxation of ban.

U.O.No.24/126-SO (OP)/2007/23

(BABAR HUSSAIN EFFENDI)
Secretary to Government of Sindh

Karachi dated the 03 /10 /2013

CHIEF SECRETARY SINDH

CHIEF MINISTER SINDH

OK
Approval received on 29/11/13 from CM Secretariat

ANNEXURE – II: Acknowledgement from NSUSC



NORTH SINDH URBAN SERVICES CORPORATION LIMITED

NSUSC/USAID-JCD/2012/4800

May 22, 2012

Program Director
Sindh Cities Improvement Program (SCIP)
Planning & Development Department
Government of Sindh
Karachi

Subject: Formalization of NSUSC's responsibility for O&M of municipal infrastructure in Jacobabad, required for Foreign Assistance Act (FAA) Section 611(e) Certification.

This is with reference to letter dated May 09, 2012 on the above mentioned subject; the requisite information is furnished as required.

Operation and maintenance (O&M) organizational structure

Director Operations and Services (DOS) supported by the Operational Team at Head Office Sukkur including Manager Water and Waste Water, Manager Solid waste and Manager Customer Care along with team of Engineer to support performance improvement and Bench Marking at Jacobabad through intensive site based support.

Staff Resources

At the City Level, an Operational Team will be placed as per Operational Model of Regional offices of NSUSC with the following technical staff: The proposed staff will be Graduate Engineer with atleast 5 to 7 years of experience (serial 1- 5) appointed by NSUSC through its senior Management in an open and transparent manner.

1. Deputy Manager Operations & Services (Overall In charge) –reporting to DOS
2. Water Production and Plant Engineer (Water production and Treatment Plant Operations)
3. Water Supply Network Engineer (Water supply distribution and network improvement and maintenance)
4. Sewer Network Engineer (Sewerage and Waste Water treatment and Disposal Stations operations)
5. HSE Officer (HSE and Environmental Compliance)
6. Customer Complaints Officer (Complaints and Billing)
7. Accountant

In addition, all staff currently employed by the Municipal Committee will also be transferred to NSUSC on Deputation as per SAMAs, thus maintaining the continuity of knowledge and experience.

NSUSC under Tranche –II funded by ADB and GoSindh is planning to fund Organizational Improvement Project being designed by SCIP-5 consultant for establishing operational equipment facilities such as



NORTH SINDH URBAN SERVICES CORPORATION LIMITED

vehicles, stores, control centers and garages for effective operation and maintenance of Assets being transferred and built by Jacobabad Municipal Committee and USAID fund respectively.

Financial Resources

The Operational Support Fund will be utilized to finance improved operations for which NSUSC's initial estimates based on existing data available are Rs. 184.482 million (\$ 2.049 M). Govt. of Sindh will finance the salaries and wages of deputed staff amounting to Rs.80.700 million (\$.896M). The operation shortfall will amount to Rs.103.782 million (1.153M). NSUSC start up cost will amount to Rs.2.863 million (\$0.0318M) (Refer Annex A).

Engr. Niaz Ali Shar,
Managing Director

C C

- Allan Kelly, ADB
- PD, MSDP
- PM, MSDP, USAID
- Dir O&S & CFO NSUSC
- PS to ACS, Dev P&D, GoSindh

Annex A

NORTH SIND URBAN SERVICES CORPORATION LTD.
Operating Plan 2012-13
Operating & Capital Cost Summary
Jacobabad

S.No	Particular	Water Supply	Waste Water	Solid Waste Management	Total PKR	USD
1	Salaries & Wages - TMA Salary/Wages	10,200,000	25,500,000	45,000,000	80,700,000	896,667
	20%- NSUSC Deputation Allow.	1,020,000	2,550,000	4,500,000	8,070,000	89,667
	Employee Incentive	1,020,000	2,550,000	4,500,000	8,070,000	89,667
2	Electricity/ Power Generation	29,046,067	16,419,375	-	45,465,442	505,172
3	Chemicals and Consumables	3,209,884	2,000,000	2,000,000	7,209,884	80,110
4	Travel & Conveyance				1,200,000	13,333
5	Vehicle Cost - SWM	-	-	7,800,000	7,800,000	86,667
6	Maintenance and Regular Repair	6,500,000	6,500,000		13,000,000	144,444
7	NSUSC Administrative Expenses				8,467,200	94,080
8	System Improvement Costs	-			3,000,000	33,333
9	Other Operating Expenses				1,500,000	16,667
	Total	50,995,951	55,519,375	63,800,000	184,482,526	2,049,806
	Less Other Income GOS Grants - Salary & Wages	(10,200,000)	(25,500,000)	(45,000,000)	(80,700,000)	(896,667)
	Operation Shortfall	40,795,951	30,019,375	18,800,000	103,782,526	1,153,139
	NSUSC startup cost				2,863,000	31,811
	Total Funds Requirement				106,645,526	1,184,950

USD @ Rs.90

ANNEXURE – III: NOC from GOS for Pipe Laying on Public Roads



OFFICE OF THE
DEPUTY COMMISSIONER /
ADMINISTRATOR MUNICIPAL COMMITTEE
JACOBABAD
No. DC(PS)/225/2013, Dated: 19/07/2013

Ph.# 0722-653999,652020
Fax# 0722-653711

Project Director,
MSDP,
Karachi.

1)

1)

SUBJECT: INSTALLATION OF URBAN WATER SUPPLY LINE BY PROGRAM MANAGEMENT UNIT, USAID SINDH MSDP FOR JACOBABAD TOWN.

1/13

With reference to the captioned subject, please find attached the letter of Assistant Engineer, Provincial Highways, Jacobabad Sub Division, for your information and further necessary action.

(FAYAZ AHMED JATOI)
DEPUTY COMMISSIONER
JACOBABAD



OFFICE OF THE ASSISTANT ENGINEER PROVINCIAL HIGHWAY SUB DIVISION JACOBABAD

No.SDC 490 /of 2013

Jacobabad Dated: 7 July, 13

To,

The Deputy Commissioner,
Jacobabad.

Subject: INSTALLATION OF URBAN WATER SUPPLY LINE BY
PROGRAM MANAGEMENT UNIT, USAID SINDH MSDP FOR
JACOBABAD. TOWN

Reference: Your honour directions conveyed in the meeting held on 17-07-2013.

It is submitted that right of way of following Roads for the subject scheme
is as under:-

- | | |
|---|----------|
| 1. Jacobabad- Dodapur-Garhi Khairo Road (Total Width) | 110 Feet |
| 2. Mouladad-Dargah Rehmat pur Road (Total Width) | 110 feet |
| 3. Mouladad-Nawra Road (Total Width) | 110 feet |


ASSISTANT ENGINEER
PROVINCIAL HIGHWAY SUB DIVISION
JACOBABAD

ANNEXURE – IV: Notes of Meetings



Meeting to Discuss Environmental Compliance and preparation of Environmental Documents for Jacobabad Municipal Infrastructure under Sindh MSP

Minutes of the Meeting

21 February 2013

Venue: Marriott Islamabad

Participants:

1. Andrei Barannik, Regional Environmental Advisor (Asia, OAPA and Middle East)
 2. Asim Aziz, Development Program Specialist (Environment) – USAID
 3. Shahid Mahmood, Senior Program Engineer – USAID
 4. Ghufuran Shafi, Engineering Specialist – USAID
 5. Dr. Mohammad Bashir Lakhani, Chief of Party – AAA, A/E Contractor
 6. Kashif Masood, Manager Environmental Engineering – AAA, A/E Contractor
 7. Ibad ur Rehman, Manager – AAA, A/E Contractor
- Meeting started with Introduction of the participants.
 - AAA gave a presentation on the proposed infrastructure construction works in Jacobabad. There are three broader components of the municipal infrastructure works namely watery supply, sanitary network and solid waste managements. It was agreed that three environmental documents shall be developed, one for each component.
- General
- AAA mentioned that they have been continuously consulting with the communities and carrying out FGD at different levels. The records of the meeting and consultation shall be used in forming baseline for the municipal works in Jacobabad.
 - AAA shall explain in the environmental documents how the public consultation and concerns were taken into account while developing the detailed designs for different infrastructure.
 - USAID intends to engage a specialized firm for community consultation. The environmental documents shall reference this mentioning that the engaged firm will assist in looking after the social aspects of the construction activities.
 - Government commitment to the project shall be highlighted. This shall include an introduction of NSUSC – the company who shall be responsible for O&M of the municipal infrastructure. Investments that GoS has made on their own for the project shall also be highlighted – this shall include the dedicated electricity feeders for pumping stations, land acquisition for stabilization ponds, landfill etc.
 - Much of the details regarding the proposed works are explained in the Inception Report. The design information need not be repeated in detail in the environmental documents rather the

environmental documents shall frequently reference to the relevant chapters of Inception Report. Other background documents shall similarly be referenced frequently in the footnotes.

- Health, hygiene and other social benefits that are anticipated by the end of the project shall specifically be highlighted.

(Post Meeting Note: MSI, engaged by USAID has developed a baseline for Jacobabad which provides information about the prevalence of water borne diseases. The baseline study has been shared with AAA. AAA shall make use of the baseline report in preparing the environmental documents).

Water Supply

- The baseline will clearly indicate the existing conditions of the Jacobabad town. Current Population and the design population shall be described and the limitations of the existing water supply system shall be presented. This will include existing water intake details at the Kirther Canal, quality of the canal water, conditions of the existing lagoons and their capacity, the working of the existing filtration plant, all the physio-chemical processes including the disinfections planned for the filtration plant.
- AAA shall mention that the design of the water system has been modified to incorporate the suggestions proposed by the Master Plan being prepared by the NSUSC consultants for Jacobabad.
- O&M issues in the post-construction stage shall be highlighted and the document shall mention how those issues will be addressed: dedicated feeder lines to overcome issue of severe electricity shortages, preparation of manuals to handle, store and use the disinfectant chemicals, and scope of NSUCS as operator of the Jacobabad municipal system will be explained.
- EMMP shall have information about post construction, operational phase. Cheap and easy tests shall be recommended for regular verification of WQ.

Sanitation

- AAA shall develop a baseline for the sanitary network which shall mention the issues with the GoS initiated sanitary works under the public sector development schemes.
- The proposed interventions shall include completion and rectification of GoS left over works through the funding provided by Government.
- The complete treatment of sewage in the oxidation ponds shall be elaborated and the expected WQ parameters of the final discharge mentioned. They must comply with relevant environmental laws.
- It shall be mentioned that the treated discharge is being used to irrigate the lands (this shall be described as a potential benefit of the project)
- EMMP for the post construction, operational phase shall be developed. The machinery/equipment provided for the operational phase like dredger, drying beds shall be mentioned.
- Design and status of the existing lagoons be explained (referenced to Inception Report). Expected design life of the oxidation lagoons need to be mentioned.

Solid Waste Management

- The environmental documents shall explain the design of the Solid Waste system. AAA explained that the existing NSUSC system at Sukkur has been followed and this needs to be documented.
- The public consultation, and the meetings held in this regard require specific mention in the environmental forms.
- AAA shall explain that the land was already procured by GoS for developing a landfill. AAA shall mention that they have independently reviewed the site and found it technically feasible for development as a landfill.
- It shall be explained that the hazardous waste from health facilities will be incinerated in the incinerator being provided at the USAID funded Jacobabad Institute of Medical Sciences (JIMS).

Electro Mechanical Equipment and Machinery

- Contactor can proceed with procurement of electro mechanical machinery as long as the procurement complies with federal procurement laws

Follow up Actions

- USAID shall submit the Notes of the Meeting to the Contractor by 27th February 2013.
- AAA will submit the environmental documentation for water supply taking into account the points discussed in the Meeting by 8th March 2013.

Minutes of DVC Meeting

DVC Meeting Agenda:

Discuss and explain comments from MEO and REA-Asia, Middle East & OAPA on:

1. EDF/EMMP for Water Supply System of MSP-Sindh (Jacobabad)
2. EDF/EMMP for Sewerage System of MSP-Sindh (Jacobabad)

Date: Thursday October 03, 2013

Time: 1530hrs (PST) to 1700hrs (PST)

Venue: USAID Islamabad – Nanga Parbat Meeting Room
USAID Karachi – Deputy Mission Director Karachi Office

PARTICIPANTS:

<u>S. No.</u>	<u>Name</u>	<u>Designation</u>	<u>Organization</u>
1.	Andrei Barannik	REA-Regional Environmental Advisor / Asia, Middle East & OAPA	USAID Islamabad
2.	Asim Aziz	Deputy Mission Environmental Officer	USAID Islamabad
3.	Syed Aslam Iqbal	Project Management Specialist (Engg.)	USAID Karachi
4.	Dr. Muhammad Bashir Lakhani	Chief of Party - AAA-TCI-EMS	USAID Contractor
5.	Huma Tariq	Design Engineer - AAA-TCI-EMS	USAID Contractor

INVITEES WHO WERE UNABLE TO ATTEND:

<u>S. No.</u>	<u>Name</u>	<u>Designation</u>	<u>Organization</u>
1.	Ross Hagan	Director – Office of Infrastructure & Engineering	USAID Islamabad
2.	Multiple	Engineers - Office of Infrastructure & Engineering	USAID Islamabad
3.	Kashif Masood	Principal Environment Engineer - AAA-TCI-EMS	USAID Contractor

Discussion/Agreement:

Brief summary of discussion is summarized below;

1. REA explained that in accordance with BEO-OAPA approved MSP-IEE (OAPA Tracking #: OAPA-13-SEP-PAK-0023), COR and MEO/DMEQ have been delegated the authority to approve EDFs/EMMPs at Mission level.
2. REA reviewed and provided comments on subject EDFs/EMMPs in addition to those provided by the MEO, which should be addressed in the first place.
3. REA showed his disappointment with the quality of both reports as he had already provided guidance in a face to face, together with DMEQ, with the Consultant meeting back in February 2013, with minutes of the meeting circulated on February 21, 2013
4. AAA team shared that after signing contract modification during last week they are now in better position and have clear understanding of assigned scope of work for waste- and drinking water systems. They accordingly expressed their comfort to address the comments from REA and MEO to improve EDFs/EMMPs under discussion
5. REA while referring to his latest review comments and review comments by MEO explained in detail that EDF/EMMP should document and explain very clearly and in sufficient detail (briefly with referencing to finalized project technical documents) at least but not limited to the following;

- a) Clarify reporting requirement, format of reporting and distribution of reports in EMMP including reporting to USAID-COR
- b) Thoroughly check documents to remove inaccuracies and inconsistencies
- c) Update scope of work to clearly and accurately include and explain all project activities by listing all the project components under repair / rehabilitations / renovation / expansion / improvement / new construction etc. to the funded by USAID the project background and project area of influence
- d) Reference to the conditions established in IEE for MSP (OAPA Tracking #: OAPA-13-SEP-PAK-0023)
- e) Establish legislative and regulatory framework for the proposed project activities with reference to Pakistan national environmental, health, safety, construction requirements, norms and standards, and applicable international obligation as well as US standards to be applied, if warranted
- f) Provide a brief engineering and environmental review (EER) of repair / rehabilitations / renovation / expansion / improvement / new construction activities to be undertaken
- g) Provide references to engineering design/specifications of electro-mechanical components, repair / rehabilitations / renovation / expansion / improvement / new construction etc., (if any), EHS, etc. norms and standards employed for the project components' planning and design
- h) Develop waste management plan that will include inventory of waste, handling & storage of waste, separation, re-use & re-cycling of waste, transportation and safe disposal of waste including those that may be hazardous and toxic like PCBs, asbestos (their transport routes and authorized disposal sites) etc. at the approved sites
- i) Document direct environmental and social benefits of the project
- j) It is wise to report the benchmark and current status of sewerage and water supply system
- k) The scope and nature of current environmental and social problems associated with non-operational sewage, waste-water and drinking water infrastructure and systems, including those related to original design flaws (including under the ADB program) should be briefly discussed
- l) Provide a commentary on the need of replacement and up-gradation in relation to the aging and original design of installed equipment
- m) Schedule of activities should be attached with discussion
- n) Design improvements like life of equipment, efficiency, new technology and latest engineering practices should be documented in improvements
- o) Project location maps, schemes etc., and area maps for easy understanding of the project its location and its surrounding for the reader sitting anywhere in the world and reviewing subject EDF.
- p) Since the designs have been already completed, more specific information should be provided on the scope and nature of activities to be funded by USAID.
- q) Include discussion of how, if any, industrial effluents or wastes are being handled
- r) Discuss how sewage and water supply relate to each other, and whether problems identified during public consultation, like sewage leaking into potable water supply, has been addressed into the design
- s) Site photographs of old outdated equipment, project site and its components captured from site while your team visited the site for gathering data and info for environmental documentation
- t) Report about the use of local labor
- u) Report about labor and machinery camps, transportation routes for material/machinery and include in EMMP

- v) Discuss and Report on the availability / permit & license from respective GoP authority on the requirement of un-interrupted quantity of water from canal as per current design of the system for the projected population
- w) Include discussion on the capability requirements during operational phase for the proposed upgraded systems
- x) Define and document recommended process for water quality monitoring throughout operational phase of project
- y) USAID contractor capability to mobilize at site for engineering and environmental audit and engineering quality control. Organogram showing detail team composition may be included as an attachment and with reference to EDF.
- z) Suggest scheduling and sequencing of project activities e.g. excavation in streets, to avoid discomfort to the locals, disruption in utility services and damages to the private property and damage to other public infrastructure
- aa) Available Records (pictures etc.,) of consultations with GoP staff and Public (including women, youth and elders etc.) are also required to be documented in EDF.
- bb) For procurement, use and safe disposal of equipment use following language that "The recipient will properly manage and dispose equipment (computers, electric generators, electro-mechanical equipment, machinery, laboratory equipment, etc.) when its useful life ends. All such equipment will be disposed in an environmentally safe manner by a certified company in accordance with Pakistani laws, and in their absence, in accordance with international best practices acceptable to USAID (alternatively, when procuring equipment from a licensed provider/dealer an agreement may be reached that such equipment will be returned to the dealer for its environmentally safe disposal). For procuring of electronic and miscellaneous equipment and furniture, the Implementers will adhere to USAID's general policies on commodity eligibility provided at <http://www.usaid.gov/policy/ads/300/31251m.pdf> and will not finance unsafe or ineffective products, such as certain pesticides, food products, or pharmaceuticals and other commodities not eligible for financing under this policy."
- cc) It is likely, that certain chemicals and disinfectants to be procured and consumed in project may contain chemicals that are regulated by USAID pesticides procedures. To promote pesticide safety, the USAID environmental regulations require that for any pesticide, or any chemical that can also be used as pesticide, a Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP) shall be prepared. USAID/Pakistan Mission has a BEO/OAPA-approved Programmatic PERSUAP and a PPERSUAP Update, which shall be used for any procurement, use and/or recommendation for use of pesticides. Referred USAID/Pakistan PPERSUAP, covers procurement, use or recommendation of use of pesticides in all sectors ongoing and planned programs and projects in the country for the forthcoming 3-5 years. The PPERSUAP will be amended by the USAID-accepted PERSUAP professional and approved by the BEO/OAPA to include any additional broadly defined pesticides, which may be needed and allowed for procurement and use under the MSP program. AAA team is advised to cross reference MSP recommended chemicals and disinfectants to the PPERSUAP and recommend the update in case it is required.
- dd) Annex these minutes of meeting to the EDF
- 6. List down all potential impacts in the EMMP for all three stages of i) planning & design, ii) implementation and iii) operation & maintenance, and provide mitigation, monitoring and reporting measures referring to the best industry practice as much as is possible and also documenting the code references for the installation of project components.
- 7. REA handed over a sample document (IEE for India's Capital Cities Development Investment Program) and hard copy printed subject EDF/EMMPs containing his hand written comments. Scanned copies of these documents are also transmitted along with these minutes.

8. To facilitate AAA team develop appropriate EDF/EMMP, REA-USAID Asia & OAPA provided links to some relevant environmental documents to AAA team which are as follows;

- i. <http://water.epa.gov/infrastructure/watersecurity/climate/upload/epa817k11003.pdf>
- ii. <http://www.waterraed.org/~media/Publications/social-accountability-tools-mechanisms-urban-water-services.pdf>
- iii. http://www.wsp.org/sites/wsp.org/files/publications/330200725049_afBetterWaterandSanitationForTheUrbanPoorGoodPracticeFromSSA.pdf
- iv. http://www.unicef.org/wash/files/Wat_e.pdf
- v. <http://www.eclac.org/publicaciones/xml/1/49891/Bestpracticesinregulating.pdf>
- vi. <http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTOPMANUAL/0,,menuPK:64701637~pagePK:51628525~piPK:64857279~theSitePK:502184,00.html>
- vii. http://www.adb.org/sites/default/files/pub/2006/gender_checklist_water.pdf
- viii. <http://www.adb.org/sites/default/files/projdocs/2012/44019-013-prc-eia-draft.pdf>
- ix. <http://www.adb.org/projects/45148-007/documents>
- x. <http://www.adb.org/sites/default/files/projdocs/2011/42489-043-uzb-iee-03.pdf>
- xi. <http://www.adb.org/sites/default/files/projdocs/2011/42489-043-uzb-ippf.pdf>

Targets:

AAA will submit draft EDF/RR and EMMP for both subject components of MSP-Sindh (Jacobabad) Project, in accordance with above discussion on October 24, 2013 for USAID review and mission approval.

Follow-up:

REA/Asia & OAPA recommended a follow-up DVC meeting should be held between AAA, USAID-KHI and USAID-ISB preferably during mid of October 2013

ANNEXURE – V: Chance Find Procedure

Project routing does not envisage any archeological site. However, in case of any chance find, the **Contractor** will immediately report through **Chief Resident Engineer** of Supervision Consultant to **Deputy Commissioner (DC) of Jacobabad City**, to take further suitable action to preserve those antiques or sensitive remains and contact the relative **Government Department (Archeological Department, Government of Pakistan)** for further action. Representative of the **Archeological Department, Government of Pakistan** will visit the site and observed the significance of the antique, artifact and Cultural (religious) properties and significance of the project. The report will be prepared by representative and will be given to the **concerned official** of the Archeological Department.

In case any artifact, antiques and sensitive remains are discovered, chance find procedures should be adopted by Contractors as follows;

- ❑ Stop the construction activities in the areas of chance find;
- ❑ Delineate the discovered site or area;
- ❑ Consult with the local community and Provincial Archeological Department
- ❑ The suggestion of the local communities and the concerned authorities will be suitable incorporated during taking the preventive measures to conserved the antique, artifact and Cultural (religious) properties
- ❑ Secure the site to prevent any damage or loss of removable objects. In case of removable antiquities or sensitive remain, a night guard shall be arranged until the responsible local authorities take over;
- ❑ After stopping work, the contractor must immediately report the discovery to the Supervision Engineer.
- ❑ Once authorization has been given by the responsible authorities (Archeological Department), the contractor will be informed when works can resume.

ANNEXURE – VI: Monitoring Sheets

Contractor

Consultant

Preliminary Approval Form of Campsite, Workshop, and Equipment Yard

- | | |
|---|---------------------------------------|
| 1. Land Type | <input type="checkbox"/> Yes |
| 2. Land Use | <input type="checkbox"/> No |
| | <input type="checkbox"/> Agricultural |
| | <input type="checkbox"/> Barren |
| 3. Area of Campsite (Acres) | |
| 4. Area of Workshop/Equipment Yard (Acres) | |
| 5. Minimum Distance of Campsite from Nearest Settlement (Meters) | Upwind----- |
| | Downwind----- |
| 6. Minimum Distance of Workshop/Equipment Yard from Nearest Settlement (Meters) | Upwind----- |
| | Downwind----- |
| 7. Location, Campsite, Workshop/Equipment Yard | <input type="checkbox"/> Yes |
| 8. Provisional Approval of Location Granted | <input type="checkbox"/> No |
| | <input type="checkbox"/> Yes |
| | <input type="checkbox"/> No |
| 9. Date of Submission | |
| 10. Date of Approval | |

 PROJECT MANAGER (CONTRACTOR)

 RESIDENT ENGINEER (SUPERVISION
CONSULTANT)

Contractor**Consultant****Final Approval Form of Campsite, Workshop, and Equipment Yard**

- | | |
|---------------------------------------|------------------------------------|
| 1. Type of Land Possession | <input type="checkbox"/> Rented |
| | <input type="checkbox"/> Purchased |
| | <input type="checkbox"/> Leased |
| 2. Agreement of Possession Attached | <input type="checkbox"/> Yes |
| | <input type="checkbox"/> No |
| 3. Preliminary Approval Form Attached | <input type="checkbox"/> Yes |
| | <input type="checkbox"/> No |
| 4. Final Approval of Location Granted | <input type="checkbox"/> Yes |
| | <input type="checkbox"/> No |
| 5. Date of Submission | |
| 6. Date of Approval | |

PROJECT MANAGER (CONTRACTOR)

**RESIDENT ENGINEER (SUPERVISION
CONSULTANT)**

Daily Dust Monitoring Form (Construction Site)

Date: _____

Contractor**Consultant**

Practice	Yes	No	In Case of Non - Conformance	
			Duration (hrs)	Remarks/Reasons
Speed of vehicles/equipment within the limits (less than 20 km/hr)				
Spraying of water done twice on unpaved tracks				
Haul trucks carrying sand or aggregate covered with tarpaulin				
Cover silos openings during operation				
Monitored by:			<hr/> SITE ENGINEER	

Request for Removal of Shrubs and Trees (If Required)

Contractor

Consultant

- | | |
|---|------------------------------|
| 1. Need Reported to Project Manager by: | Name & Designation: |
| 2. Reported to Project Manager on | Date: |
| 3. Location of Vegetation to be Removed | |
| 4. Reported by Project Manager to Resident Engineer | Date: |
| 5. Approval Granted by Resident Engineer | <input type="checkbox"/> Yes |
| | <input type="checkbox"/> No |
| 6. Date of Submission | |
| 7. Date of Approval | |

PROJECT MANAGER (CONTRACTOR)

RESIDENT ENGINEER (SUPERVISION
CONSULTANT)

Form for Recording of Air Quality

#	Location	Parameter	Date	Results	Test Report Number
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
<hr/> PROJECT MANAGER (CONTRACTOR)			<hr/> RESIDENT ENGINEER (SUPERVISION CONSULTANT)		

Form for Recording of Air Quality @ Stack Machinery/Equipment

#	Location	Parameter	Date	Results	Test Report Number
1					
2					
3					
4					
5					
6					
7					
8					
<hr/> PROJECT MANAGER (CONTRACTOR)			<hr/> RESIDENT ENGINEER (SUPERVISION CONSULTANT)		

Form for Recording of Water Quality on WHO/GOP Standards

#	Location	Parameter	Date	Results	Test Report Number
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
<hr/> PROJECT MANAGER (CONTRACTOR)			<hr/> RESIDENT ENGINEER (SUPERVISION CONSULTANT)		

Form for Recording Noise at Construction Site

#	Location	Date	Results	Test Report Number
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
<hr/> PROJECT MANAGER (CONTRACTOR)		<hr/> RESIDENT ENGINEER (SUPERVISION CONSULTANT)		