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SUE "DEPARTMENT OF OPERATION OF INTERREGIONAL WATER MAIN "TUYAMUYUN-
URGENCH"
EUROPEAN BANK FOR RECONSTRUCTION AND DEVELOPMENT

NAMANGAN AND HOREZM OBLASTS WATER AND WASTEWATER MODERNIZATION PROJECT

FEASIBILITY STUDY

NON-TECHNICAL SUMMARY
HOREZM OBLAST

ADDRESS CECT Consulting LLC
3-5, bld.1, Gazetny Lane
125993 Moscow
Russian Federation

TEL +7 495 629 93 92

FAX +7 495 629 88 84

WWW cect.eu

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ABBREVIATIONS

Company, Client, Enterprise	State Unitary Enterprise “Department of Operation of Interregional Water Main “Tuyamuyun-Urgench” (Horezm Oblast Water & Wastewater Company)
EBRD, Bank	European Bank for Reconstruction and Development
E&S	Environmental and Social
EHS	Environment, Health and Safety
ESAP	Environmental and Social Action Plan
LTIP	Long-Term Investment Program
NTS	Non-Technical Summary
O&M	Operation and Maintenance
OHS	Occupational Health and Safety
PIP	Priority Investment Program
PR	EBRD Performance Requirements
SEP	Stakeholder Engagement Plan
SPZ	Sanitary-Protection Zone
WS	Water Supply
WTP	Water Treatment Plant
WW	Wastewater
WWPS	Wastewater Pumping Station
WWTP	Wastewater Treatment Plant

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1 Introduction

State Unitary Enterprise “Department of Operation of Interregional Water Main “Tuyamuyun-Urgench” (hereinafter referred as “Company” or “Enterprise”) provides water and wastewater services in Horezm oblast including 3 cities, 16 urban-type settlements and about 600 rural settlements. Government of Uzbekistan, on behalf of the “Department of Operation of Interregional Water Main “Tuyamuyun-Urgench” has approached the European Bank for Reconstruction and Development (the “EBRD” or the “Bank”) with the request to finance a priority investment program (“PIP”) for rehabilitation of water and wastewater infrastructure (the “Project”) operated by the Company. The total population of the Horezm Oblast is approx. 1,777,000 people.

State Unitary Enterprise “Department of Operation of Interregional Water Main “Tuyamuyun-Urgench” is 100% owned by Horezm oblast administration. The Company provides municipal services including water and wastewater services to residential customers, industries and organisations. The Company’s responsibilities cover provision of services to the consumers in Urgench, Khiva and Pitnak. The major operations of the Company, as a provider of water supply and wastewater services, include the following:

- › Abstraction of surface water from the river Amudarya and irrigation canal Shavat using two major water intakes;
- › Surface water treatment at two major water treatment plant located in the city of Pitnak and city of Urgench;
- › Transmission and distribution of potable water;
- › Collection, transportation and treatment of wastewater;
- › Connection of customers to water and sewerage networks.

The total population living within the Company’s service area is about 1.777 mln people. The service area is 6300 km². The centralized water supply services are provided only to approx. Currently 52 per cent of the Horezm oblast’s population is provided with centralised water supply system, mostly only for 8-10 hours a day. About 65% of private houses connected to the water supply system have water meters at the inlets. Almost 100% of commercial and budgetary consumers are also provided with water meters. Almost all consumers in apartment buildings (about 130,000 people) have no water meters.

Water is abstracted from two surface water intakes. Only 8 per cent of the region’s population is connected to the centralized sewage system. Both systems in the Horezm oblast are old and in an extremely poor condition, which results in: low service reliability, water losses, non-existent waste water treatment process due to the deteriorated conditions of the three WWTPs, deteriorating working conditions for pumping station employees, an increasing accident rate.

The centralized wastewater collection systems only exist in three towns of Horezm oblast: Urgench, Khiva, Pitnak. The population of other settlements uses freestanding pit toilets and septic tanks. Household and industrial wastewater is discharged in the sewage network while rain water is collected

and transported via open storm drains. Only about 8% of the region's population is connected to centralized sewage system (22,786 customers or 143,100 inhabitants).

To ensure the required degree of treatment the project provides for multi-stage, mechanical and biological treatment of incoming wastewater. The Project also assumes dehydration, post-treatment and maturing of the sludge. Tertiary treatment for nutrient removal is not required in line with the EU Urban Waste Water Treatment Directive, based on the capacities of the WWTPs and absence of sensitive receptors. ESDD has concluded that through connection of new customers to the wastewater system, accounting for and controlling the quality of wastewater entering the system, improvement of the wastewater treatment process (currently non-existent), the Project will reduce sanitary and epidemiological risks and adverse impacts on the environment and on water bodies. Reconstruction of the existing WTP will result in decreased H&S and environmental risks related to use of liquid chlorine, while allowing for connection of at least 150,000 people and increased reliability.

1.1 Why the project in the water sector of Uzbekistan is needed?

This Project is based on technical, financial and institutional assessment of the water supply and wastewater treatment system of the area serviced by SUE "Department of Operation of Interregional Water Main "Tuyamuyun-Urgench". It incorporates the technically and financially sound investments aimed at achieving a safe and reliable water supply and wastewater treatment to households residing in the project area in an environmentally and economically sustainable fashion.

The objectives of the project are:

- > improvement of Company's operational efficiency;
- > reduction of operational costs;
- > reduction of water losses;
- > improvement of services' quality (reliability and quality of water supply and wastewater removal & treatment) and connection of new customers to WS and WW systems;
- > minimisation of negative environmental impacts.

Implementation of PIP projects will allow reaching significant effect in social environment due to increasing of total operating reliability and sustainability of water supply. PIP implementation will also allow reaching better wastewater treatment.

The activities included into PIP were defined as priority because they:

- > Improve the reliability of the service;
- > Ensure due quality of the supplied water;
- > Create new connections;
- > Improve the compliance with the national regulations and EBRD PRs;
- > Improve the quality of wastewater treatment;
- > Improve of the operational efficiency, the safety of the employees and the quality of the work;
- > Are financially feasible.

The project will have the following outcomes:

- > Reduction of environmental impacts in respect to land, water and groundwater contamination;
- > Reduction of community health risks related to the secondary contamination
- > Improved natural resources management through operation of low-energy equipment;
- > Improvement of reliability of water and wastewater services as well as the quality of life in the communities as a result of better Company's asset management;

- › Operating in compliance with national legislative requirements.

1.2 Who will pay for the improvements?

EBRD is considering a senior loan Government of Uzbekistan to finance priority investments in rehabilitation and modernisation of the water intake facilities as well as water distribution networks and reconstruction of the wastewater treatment plant for Company. The Project is expected to allow connection of the new customers, improve quality and reliability of services, reduce water losses, as well as enhance the operational and financial efficiency of the Company.

A loan from the Bank will be the source of the financing of the Project. The loan is expected to be repaid from cost savings and increased revenue generation.

Project Categorised as “B” in accordance with the EBRD's Environmental and Social Policy 2014. The Environmental and Social Due Diligence (ESDD) for the proposed Priority Investment Programme (PIP) for the Project was carried out as part of the Feasibility Study by independent consultants engaged under the IPPF. It included a review of current practices, an assessment of the Project's potential E&S impacts and a review of the Company's E&S provisions and management capacities.

The Company has assigned environmental, H&S and HR personnel with a good understanding of environmental and social national legal responsibilities related to its operations. The Company is operating in compliance with national legislation and related permits (where issued) with some non-compliances addressed with corrective measures in the ESAP.

Project Environmental and Social Due Diligence (ESDD) was carried out within the scope of the Feasibility Study so as to identify risks, impacts and benefits and to structure the Project to comply with the EBRD Environmental and Social Policy (ESP) (2014) and Performance Requirements (PRs). The works undertaken within the scope of ESDD included, among others:

- › Identifying existing and Project-related environmental and social impacts and risks (including implications in terms of gender and for vulnerable groups);
- › Describing and characterising relevant environmental and social baseline commensurate with the risks posed by the current site operations and the Project;
- › Addressing gender issues in the ESDD and through the PRs related to the Project, including employment opportunities for women and tailored stakeholder engagement provisions;
- › Reviewing the Project Company existing environmental and social management systems, policies and practices, including human resources and employment, occupational health and safety, and pollution prevention measures available at the facilities.
- › Carrying out an Environmental and Social Assessment and developing a draft Environmental and Social Assessment Report in accordance with the Bank's requirements as defined in the ESP, including a Summary table on Compliance with the Bank's PRs.

2 Description of the new system

Priority investments program (PIP) proposed to implement activities on integrated reconstruction and modernisation of water supply and wastewater facilities of Horezm Oblast. Long-term investment program for the modernization of the wastewater treatment and water supply systems involves much more extensive list of projects, including projects for water supply and wastewater treatment modernisation. All projects are developed using modern technologies and standards and meet national requirements and the requirements of the EU.

PIP includes the following components:

1. *Development of GIS and hydraulic model of the water supply and wastewater systems of Horezm Oblast;*
2. *Introduction of the Supervisory Control and Data Acquisition system (SCADA);*
3. *Procurement of special machinery and equipment for the organization of scheduled and emergency repair works at the water supply and wastewater facilities;*
4. *Procurement of vehicles;*
5. *Construction of underground water intake in the towns of Urgench, Bagat, Shavat, Gurlensk and Khankin district;*
6. *Reconstruction of water supply pumping stations;*
7. *Supply and installation of control valves at the water mains and water supply distribution networks;*
8. *Supply and installation of water meters and process flow meters;*
9. *Reconstruction of WTP in the towns of Urgench and Pitnak;*
10. *Reconstruction and Modernisation of WWTPs in Urgench, Khiva and Pitnak.*

2.1 Reconstruction of WTP in the towns of Urgench and Pitnak

The only source of water supply in the region is the Amu Darya River. The Shavat irrigation canal receives water from the Amudarya river. The water from the source is cleaned at two wastewater treatment plants (WTP), located in Pitnak and in Urgench. WTP of the town of Pitnak includes two operating lines with a capacity of 100 thousand m³/day each and an incomplete line of 100 thousand m³/day. WTP was put into operation in 1997. WTP of the town of Urgench was built in 2010 and has a design capacity of 100 thousand m³/day.

When turbidity in the source is more than 40 mg/l WTP of the town of Pitnak is not able to provide a total capacity of two lines of more than 120 thousand m³/day. The required decrease in the turbidity in water content is not ensured due to the poor condition of primary and secondary clarifiers. The volume of treatment water is almost halved compared to the design indicators. A further decrease in productivity will be noted with higher turbidity.

One of the issues for both the Urgench and Pitnak WTPs is the use of liquefied chlorine for the disinfection of water. Facilities are located in the city. Transportation, storage and use of free chlorine pose a high environmental risk of accidental chlorine leaks, especially taking into account the deterioration of gas cylinders and equipment. The use of chlorine gas also increases the risk of the formation of carcinogenic organochlorine compounds in drinking water.

The project can be divided into two tasks.

1. Reconstruction of the WTP of the town of Pitnak with the purpose of restoration of design productivity of facilities (200 thousand m³/day);
2. Reconstruction of the disinfection system on the WTPs of Pitnak and Urgench with termination of liquid chlorine use and transfer to the use of sodium hypochlorite solution, which will be produced from sodium chloride by means of electrolysis.

As a result of the reconstruction, the design capacity of WTP of the town of Pitnak will be 200,000 m³/day, the capacity of the WTP of the town of Urgench will not change.

All works will be carried out in the water protection zone of the Amudarya River and the Shavat irrigation canal, therefore, their planning should provide for measures to prevent pollution of water bodies.

Expected environmental and social benefits include:

The implementation of this component will:

- > Provide additional connection to the water supply system for at least 150 thousand people;
- > Ensure round-the-clock water supply in Urgench, Khiva and Pitnak and associated settlements;
- > Secure projected growth in consumption for the next 15 years, including industrial and commercial needs;
- > Increase the reliability of service.

2.2 Reconstruction and Modernisation of WWTPs in Urgench, Khiva and Pitnak

This project includes the reconstruction or construction of new wastewater treatment facilities for three cities in the Horezm Oblast (Urgench, Khiva, Pitnak), establishing of a central sewage laboratory as part of the Urgench WWTP, construction of discharge stations for receiving wastewater from

sewage trucks in Urgench and Khiva, and the construction of a pressure WW collector from the main WW pumping station No.2 to the WWTP in Pitnak.

There are no official sewage discharge stations in the region, so the sewage trucks drain the sewage into the wells of the WWPS or directly onto the terrain. The accounting and control of wastewater is absent.

The project provides for the construction of new facilities or modernisation of existing wastewater treatment facilities in the towns Urgench, Khiva and Pitnak. The designed capacity of Urgench WWTP is 30 thousand m³/day, and the capacities of WWTPs in the towns of Khiva and Pitnak are 5 thousand m³/day each. All designed facilities will be located within the existing industrial sites of the Company.

The scope of work includes supply and installation of equipment, general construction works, dismantling works, construction of internal and external engineering communications, construction of technological pipelines, full automation of technological processes, landscaping of the territory of WWTP.

Expected environmental and social benefits include:

- › Wastewater treatment instead of untreated wastewater discharge;
- › Improving of sanitary condition of settlement and the environment;
- › Eliminating the risk of imposing environmental fines on the enterprise;
- › Increasing of services reliability;
- › Reduction of the contamination in the river Amudarya and lake Sarykamysh;
- › Ensuring the possibility of developing a wastewater system and the construction of new houses with their connection to the sewerage system;
- › Ensuring the control over discharge of wastewater from sewage trucks, the possibility of additional income;
- › Ensure the quality control of sewage discharged into the urban sewerage systems;
- › Compliance with national and EU requirements on wastewater treatment.

2.3 Construction of underground water intake in the towns of Urgench, Bagat, Shavat, Gurlensk and Khankin district

Currently, the water supply of all settlements of the Horezm Oblast is supplied from 2 major water supply facilities: WTP in the town of Pitnak and WTP in the town of Urgench. Design capacity of the Pitnak WTP is 200 thousand m³/day, the actual capacity is not more than 100 thousand m³/day. Design capacity of the Urgench WTP is 100 thousand m³/day, the water supply (after deducting water used for own needs) is about 90 thousand m³/day.

The project involves the restoration of five existing underground infiltration water intakes in Gurlen, Bagat, Shavat, Urgench and Khankin districts.

New water intakes will be located on the sites of the previously existing water intakes. These sites are located near the central regional stations. Previously, water was supplied to CWRs from the wells, at present water is supplied from water mains.

At this stage, it is assumed that each new water intake will include:

- › construction of 12 new wells with a depth of 50 m;
- › construction of prefabricated pipelines;
- › construction of facility for preparation and dosing of hypochlorite solution;

- › construction of access roads, external power supply lines, fences along the perimeter of sanitary protection zones and other auxiliary production facilities;
- › reconstruction (if necessary) of existing tanks, pumping station (within a separate project), on-site networks.

The average capacity of each water intake is about 12 thousand m³/day.

The project implementation will not change the population of the project implementation areas. There is no need for people relocation and alteration of living conditions. Project implementation will provide to the reliable water supply.

Expected environmental and social benefits include:

- › Provision of additional connection to the water supply system for at least 150 thousand people;
- › Improved water-supply schedule for 150 thousand people;
- › Increased reliability of service;
- › Increased water sales.

2.4 Reconstruction of water supply pumping stations

At present, the Company's balance sheet includes 156 pumping stations of the third and fourth elevation. WPSs are located throughout the territory of the Horezm Oblast. In fact, only 51 stations provide water supply. On most of the facilities pumping units are dismantled or require repair, and there is also no electrical equipment.

Most of the pumps and mechanical equipment on the WPSs (which have not been reconstructed) have been in operation for more than 15 years and require replacement. Part of the pumps installed during the reconstruction also failed and require repair.

There is no automation. Many pumps, by their characteristics, do not correspond to the pressure characteristics of pipelines and to the demand of the water supply systems.

The lack of protection against power surges, poor quality of power supply, frequent power outages lead to breakdown of electrical equipment and makes it difficult to introduce new automation and control equipment.

The project includes the reconstruction of 25 water pumping stations of the Company, including the junction WPSs of Urgench, Gurlensky, Khankinsky, Shavat and Bagatsky districts, connected to the major WTPs.

Project implementation will provide to the reliable water supply as well as higher resource efficiency.

Expected environmental and social benefits include:

- › Reduce operation costs because of energy efficiency, staff reduction, and savings by minimizing the routine repairs;
- › Improve the water supply schedule;
- › Improve the reliability of service;
- › Reduce accidents on water supply networks, reduce water losses.

2.5 Supply and installation of control valves at the water mains and water supply distribution networks

At present the Company has about 3500 valves on the networks. At least 60% of the valve gates and air valves are inoperative. Water is supplied to settlements and to local water-supply systems from

different water lines. Due to the poor condition of the valves it is often impossible to regulate the distribution of water between customers.

A similar situation is with air valves. At least 50% of the valves are broken and require replacement.

The project includes the purchase of new valves, air valves and their installation on the distribution networks instead of emergency ones. In total, it is planned to purchase and install about 50 air valves with diameter of 100 mm and 800 valves with diameter from 100 to 400 mm. The exact number and location of the pressure regulators and gate valves will be determined after the development of GIS and performing hydraulic modelling. Part of the valves will be used for the needs of branches.

It is assumed that pressure regulators will be installed in new manholes. New valves will be installed in existing manholes. A temporary shutdown of water-supply services to the customers will be required during construction and installation activities.

A positive long-term effect of the installation of regulatory valves relates to the decrease of the leakages and accidents and corresponding repairs and, hence, increase of service reliability and quality. This improvement will affect a significant group of customers of the Company.

Expected environmental and social benefits include:

- > Reduce the time required to eliminate accidents and, consequently, reduce the service shutdown periods;
- > Improve the schedule of water supply to the settlements;
- > Reduce water losses;
- > Reduce the cost of emergency recovery work.

2.6 Supply and installation of water meters and process flow meters

Currently there are no devices for water flow metering at the water supply system in Horezm Oblast. Evaluation of actual water balance is impossible. About 72% of the population and 100% of legal entities pay for services in accordance with readings of installed water meters.

There are no production water meters for monitoring water flows in the system. According to the Consultant's estimate, water losses in the Company are at least 60%, official reporting indicates a loss of 30%. In most settlements water supply is carried out according to the schedule, due to lack of production capacity. In absence of the real accounting of the volumes of supplied and sold water it is impossible to assess the real water balance and ensure effective work to reduce losses.

The project involves the installation of water meters on the water mains that provide water to principal water mains and in the network of individual settlements of Horezm Oblast.

The total number of water-metering units to be installed within this project is 450 pcs.

All process flowmeters will be equipped with a remote data transmission system. The data will be archived in the central dispatch service implemented during introduction of the SCADA system. This will allow the Company in the future to provide water balance control, both for the system as a whole and for all local systems.

No additional environmental impact is anticipated at the implementation stage of the project. However, additional information campaign is recommended to explain to the population why water meters will be installed and what benefits are expected.

Benefits from the implementation of this PIP component are the following:

- > Ensuring a minimum level of water loss in new systems;
- > Reducing unsustainable water consumption;

- › Ensuring the payment collection in accordance with the actual water consumption;
- › Enhanced efficiency of water supply management and Company's performance.

2.7 Development of GIS and hydraulic model; Introduction of the Supervisory Control and Data Acquisition system (SCADA)

Currently, the Company does not have a single map of water supply and wastewater networks that fully reflect the location of all linear and areal facilities. Separate maps are based on data from the 1980s.

The Company does not have a hydraulic model. The management of WS distribution network and the operation of the wastewater network is carried out mainly on the basis of the empirical experience of the personnel. This approach leads to a reduction in both the overall management effectiveness of daily production processes and long-term planning.

The company also does not have any means of monitoring the technological parameters of the main water supply system. Practically there is no information about the consumption of water, water pressure in the network, state of pumping units (on/off) and other devices. There is no centralized control and accounting of the work of facilities in the branches. All data is transmitted to the dispatching office by phone upon dispatcher requests. This situation leads to a low efficiency of the operating modes of the system.

The GIS/hydraulic modelling component assumes the development of an electronic model of the water supply in the city of Urgench, as well as systems of all water mains including all pumping stations and reservoirs. The maps will be developed on the basis of a geographic information system (GIS). The hydraulic model will be used to analyse actual regimes and simulate options for the future development of water supply and wastewater systems.

The SCADA includes the installation of monitoring, transmission and data processing units. This is required to monitor the flow rates, pressures, water levels in the tanks, and other technological parameters. The data are further transferred to the central dispatch service and to the on-duty personnel of technological facilities. The transmitted data will serve as the basis for the adjustment of the operational modes of the facilities (existing and projected water intakes, pumping stations, treatment facilities).

The project implementation will allow increased reliability of water supply and wastewater services to the customers because of the enhanced operational efficiency of the pumps and other equipment.

Benefits from the implementation of this PIP component are the following:

Installation of common water meters and process flowmeters will result in the following environmental and social benefits:

- › Reduce water losses;
- › Reduce energy consumption;
- › Optimize water supply mode in individual settlements;
- › Provide a round-the-clock water supply for 90% of customers;
- › Improve the efficiency of asset management and system development planning.

2.8 Procurement of vehicles, special machinery and equipment

Currently the Company's vehicle fleet includes 102 units of machinery, only 35% of them are operational. Most of the equipment have a service life of more than 15 years and require capital repairs for operation or are completely unsuitable for recovery.

The company is also experiencing a shortage of equipment for maintenance and repair of engineering networks and structures. This reduces the efficiency of emergency recovery operations, increases the time for scheduled repairs, and reduces the overall operational efficiency of the Company.

The project includes the procurement of special vehicles, machinery and equipment, including the following types: excavator loader, sewage sludge machines, vehicles for emergency recovery works, vehicles for sewer clean-up, power generators, welding equipment for PE pipes, motor pump's, electric welding machines, devices for cleaning sewage networks and devices for inserting pipes under pressure.

No additional negative environmental impacts will arise at the operation stage.

Benefits from the implementation of this PIP component are the following:

- > Better quality of the performed works;
- > Better working conditions;
- > Improvement of the operational safety;
- > Reducing the time for the emergency repairs;
- > Reducing water losses due to physical leaks;
- > Improvement of the efficiency of Company management.

3 Summary of E&S Report

3.1 What will be the Project impacts?

The Environmental assessment process involves an assessment and comparison of potential major impacts which may occur during some of the Project phases and the identification of adequate measures for mitigation of negative impacts, as well as for enhancement of possible positive impacts.

3.2 Environmental and Social impacts and benefits

The main immediate positive effect from the Project implementation will be connection of new customers in Horezm Oblast to the reliable water supply. This will significantly improve the sanitary conditions and minimise the risk of morbidity by water-borne infectious diseases. Project implementation will also allow reaching 24-hour supply of better quality water for the existing customers in the Horezm Oblast. About 200000 people in total are expected to benefit from the project.

PIP is also related to the water supply system renovation. It will result in the improvement of the water supply sustainability, connection of the new customers, increase of the water supply periods in the areas which do not receive the 24-hours water supply, improvement of the water quality, reducing water losses through the system. Completion of the PIP, including the rehabilitation of water intakes and disinfection facilities, will improve the quality of drinking water supplied to households. Quality is expected to meet both national and EU drinking water standards. In addition, installation of the additional water meters will contribute to the better monitoring of the water losses for further improvement of the system.

The Project will provide input to the program of water demand management actions with installation of water metering equipment for adequate billing and collection management, which will contribute to the strengthening of the Company's financial position for implementation of future investment projects.

The Environmental and Social due diligence concluded that SUE Tuyamuyun-Urgench's current operations comply with the requirements in the company's E&S obligations, as stipulated by operational permits issued by the regional and national environmental authorities. However, these operational permits may not always correspond to the requirements of national legislation, and are often adjusted to reflect the dilapidated infrastructure's actual performance. In Urgench, Khiva and Pitnak, the existing wastewater collection and treatment facilities are incapable of achieving current national wastewater standards, which are aligned with and in some cases more stringent than EU standards. The poor condition of infrastructure leads to discharge of untreated or insufficiently treated wastewater and leakages of untreated wastewater from the sewage networks. This will be addressed

through the PIP, which is designed to bring the wastewater facilities into compliance with national drinking water and wastewater standards, the EU Drinking Water Directive and Urban Waste Water Treatment Directive and the EBRD PRs.

The PIP is an essential step in the upgrade of the water supply and wastewater system serving Urgench, Khiva, Pitnak and nearby settlements.

The Project implementation will allow improvement of the wastewater treatment. Reconstruction of the WWTPs in the towns of Urgench, Khiva and Pitnak will eliminate discharge of the untreated wastewaters to the river Amudarya, artificial lake Sarykamysh and drainage canals. This will contribute to the improvement of the sanitary condition of the area, better water quality in the river and elimination of potential environmental penalties to the Company.

To ensure the required degree of water treatment the Project will provide for multi-stage treatment of incoming wastewater at the WWTPs in the towns of Urgench, Khiva and Pitnak (mechanical and biological). Tertiary treatment for nutrient removal is considered beyond requirements in line with Urban Waste Water Treatment Directive, based on the capacities of the WWTPs and absence of sensitive receptors. The Project also assumes dehydration, post-treatment and maturing of sludge.

ESDD has concluded that the overall PIP implementation have mostly a positive social character, and relating to the provision of better services to population, i.e. improvement of water-supply and wastewater services, creation possibilities for new connections to the water-supply and sewerage systems, improvement of drinking water quality to meet national and the EU standards, reduction of sanitary and epidemiological risks. In terms of environmental benefits mitigation of soil pollution risks, tangible reduction of water losses, improvements of occupational safety and working conditions for the Company personnel. All PIP components will be subject to local permitting procedures and EIA law (OVOS - Assessment of Environmental Impacts/EIA) in the future.

Site visits and desk analysis showed that the Project will improve the performance of SUE Tuyamuyun-Urgench, reduce water losses and enhance the efficiency of the sewage system, thus having high social and environmental benefits for the participating communities.

The negative impacts have, mostly, a short-term nature and relate to the construction stage. They are almost always localised within construction sites except for the projects related to modernization of water mains and distribution networks, which imply the works implementation outside the Company's existing operation sites. These impacts include noise generated by equipment, local short-term increase of traffic intensity and corresponding air emissions, soil and landscape disturbances during excavation works. These impacts can be mitigated by proper works organization, in particular, by implementation of measures recommended by the Consultant in the Environmental and Social Action Plan.

In order to reduce the key impacts associated with reconstruction/construction types of PIP projects, a selected main contractor (or main contractors if different for various projects) has to develop a Construction Environmental Management and Monitoring Plan (the "CEMMP") in the framework of PIP implementation. The CEMMP shall be prepared with due consideration of the identified risks and impacts as well as mitigation measures proposed for the construction phase in the ESDD Report and described in the ESAP. Therefore, it is expected that the PIP implementation can potentially cause moderate impacts which can be reduced to minor through appropriate management of the construction works.

The Company will be required to provide a regular performance monitoring of the contractors and/or subcontractors in respect to CEMMP compliance.

The long-term effects of the overall PIP implementation have mostly a positive social character and relate to the provision of better services to population, i.e. improvement of water-supply and wastewater services, creation possibilities for new connections to the water-supply and sewerage systems. One group of customers expected to benefit from PIP implementation is women given their roles and responsibilities in managing household needs such as cooking, laundry, family hygiene. Improved access to clean water and sanitation is expected to reduce the time burden women bear on basic household chores and promote healthier living standards.

In terms of environmental benefits, one can expect mitigation of the risks of soil pollution, improvement of the drinking water quality to the levels provided by the national legislation and EU standards, tangible reduction of water losses, improvements of occupational safety and working conditions for the Company personnel. In general, more reliable functioning of the WS and WW systems is expected.

The PIP is an essential step in the complex upgrade of the water supply and wastewater system of the whole Horezm Oblast. It covers some of the major social and environmental problems; however, some of the investments from the long list were out of the PIP and will be implemented later. Some suggestions for the EHS system modernisation for the Company are also provided in the ESAP.

The analysis of the PIP components shows that short-term adverse environmental and social impacts are possible during the implementation of construction works. The projects implementation will indeed contribute to a tangible enhancement of the Company's environmental and operational performance and will reduce its impact on the environment. The expected effects of the PIP implementation are outlined below.

Environmental effects

Negative impacts are mostly of a short-term nature and relate to the construction stage. These impacts include noise generated by equipment, local short-term increases in traffic intensity and corresponding air pollution, and soil and landscape disturbances during excavation works. These impacts can be mitigated by proper organization of works.

Wastewater treatment improvement

Currently near untreated wastewaters are discharged into the river Amudarya, artificial lake Sarykamysh and drainage canals. Reconstruction of WWTPs in the towns of Urgench, Khiva and Pitnak will eliminate this discharge from major towns of Horezm Oblast. Upon completion of all these projects the discharge of untreated wastewater from various sources in Horezm Oblast will be completely stopped. It will have a pronounced positive effect to the conditions of surface water bodies as well as groundwater and soil.

Energy saving

During the PIP projects implementation outdated electrical installations will be replaced, and adequate conditions will be created for the selection of the most efficient operational mode of the overall system. The expected energy savings because of implementation of WS components are 4 134 MWh/year. The increase of volume of supplied water (mainly because of the construction of 5 underground water intakes and connection of at least 150 000 inhabitants, as well as expansion of capacities of major WTPs (Pitnak and Urgench)) will, however, result in the increase of electricity consumption by 7 840 MWh per year. Besides, the operation of modernised WWTPs in the towns of Urgench, Khiva and Pitnak will add another 2 409 MWh/year of power consumption. Thus, the resulting increase of electricity consumption after PIP implementation is estimated as 6 115 MWh per year.

Water resources saving

Implementation of the water metering project, combined with the technical upgrade of the respective facilities will help to significantly reduce water losses in the water supply network and enhance water saving.

Greenhouse gases emission reduction

There will be moderate indirect increase of greenhouse gases emissions because of raised electricity consumption. The total increase of GHG emissions (under Scope 2) is expected at the level of 3 260 tons of CO₂ equivalent per year. This estimate is based on the most recently published national electricity grid factor for Uzbekistan (0.533 t CO₂ equiv. per MWh).

Social effects

Elimination of the liquid chlorine use

Construction of the new disinfection units at the major WTPs (Pitnak and Urgench) utilizing the electrolysis technique facilities will allow elimination of the use of the liquid chlorine. It will contribute to the safer operation of facilities. The risk of chlorine involving accidents will also be totally prevented which will have a positive effect on the health and safety of general public.

Improvement of water supply reliability

A set of the projects on networks development planning, on rehabilitation of WTPs and water intakes, and on adjustment of operational modes will allow improvement of the operational reliability of the system, as well as reduction of the total failure rate and, correspondingly, the frequency of repairs and emergency disconnections of the consumers. Affordability of tariff reforms is analysed in the section 2.3 of the Main Report.

Connection of the new residential areas

Implementation of the project will lead to the development of the water supply and wastewater system of the region, and, thus, will create possibilities for new connections to the WS and WW systems throughout the Horezm Oblast.

Improvement of drinking water quality supplied to consumers

Upon the implementation of a number of PIP projects such as the construction/rehabilitation of water intakes and disinfection facilities, the quality of drinking water supplied to households will be improved owing to the lower secondary contamination associated with the pipe obsolescence and guaranteed disinfection of bacterial contaminants.

Labour costs and Employment

Implementation of PIP will allow reducing labour costs of the Company by decreasing 50 staff positions mainly at Pitnak WTP and water supply pumping stations. These changes are related to the automation of the processes at WS facilities. It should be also noted that the eliminated job positions are currently occupied by the low-paid employees doing non-qualified manual work. At the same time, it is expected that such PIP components as new WW laboratory, construction of underground water intakes and modernisation of three WWTPs will allow creating 67 job positions, which will be occupied by qualified staff and positions will be mainly proposed for company employees where it is possible. Ex-employees which will not satisfy to the new positions requirements, will be fully compensated under current legislation and open positions will be offered through city employment centre. The resulting increase of employment is, therefore, 17 new job positions. Future increase of services will also lead to the creating of new job positions. Therefore, the effect of PIP on the employment can be regarded as moderately positive.

Gender related issues

No additional negative impact on women is expected from the project implementation if all mitigation measures (construction workplace arrangement at the first place) will be fully met. There is also a limited gender-related impact as stability of the water supply and sanitation will benefit both gender, however, it benefits housewives slightly more.

Mitigation

Project mitigation measures aligned with the ESAP will include steps aimed to eliminate and minimize project impacts:

Legal compliance – development of the separate EIAs (OVOS), Design for Maximum Permissible Discharges (MPD) under the national legislation and obtaining approvals and permits prior to start of any activities based on the development of legal compliance checklist. Including standardized clauses

specifying that contractors shall comply with the Environmental, Social, Labour, and Health and Safety requirements as described in the requirements of the Uzbek legislation, best international practices and constant control (monitoring) will allow to minimize the risks of non-compliance.

Competence – company and governmental authorities will hire suitable qualified EHS (Environmental and H&S), Manager and Social (Labour & stakeholder engagement) Manager and environmental specialist (or Environmental Engineer) to oversee implementation of legal and EBRD E&S requirements.

Environmental – development of EHS procedures and instructions based on the best international practices that can be applied in the frame of RUz legislation. Specific procedures/plans outlining correct practice and management for significant environmental / H&S / Labour aspects/risks to be developed during the project implementation. The environmental indicators and benchmarks implementation will allow to constantly monitor progress towards project aims and goals. Planning the works for the water intakes reconstruction will be outside of the spawning period.

Labour and Social – development of the “feedback” procedures and internal grievance mechanism under formalized HR policy will enable employees and non-employee workers including construction workers and other relevant workers to present their proposals on working conditions improvement as well as to submit their complaints. Screening procedure for any physical or economic displacement and further development of an appropriate compensation and/or resettlement and/or livelihood restoration action plan if required upon screening will minimize the social risks. Construction and other activities especially on agricultural areas will be started after consultation with potentially affected people, and plans will be corrected in order to minimize the impact on local people incomes. additional information campaign on the water meters’ installation before the project Component implementation

Safety mitigation measures will include both administrative and physical actions, Health and Safety Plan of the Contractor (including Trench Safety procedures and Confined Space Working procedures), program to reduce cases of the secondary bacterial contamination of water, water and wastewater monitoring program, training program, Community Health and Safety Management Plan, development of emergency preparedness and response plan, as well as ensuring proper fencing and guarding of construction sites, preventing spreading of asbestos containing dust, proper training on EHS subjects will positively minimize the safety associated risks.

3.3 Land Acquisition, Involuntary Resettlement and Economic Displacement

The proposed PIP may cause minor temporary economic displacement of industrial enterprises or farmers. This is due to the need to reconstruct water mains and water supply networks within the industrial and/or agricultural lands.

In order to avoid or minimise impacts on people, at the design stage the PIU and the Company will develop a screening procedure to identify all the land users, and determine the impacts on such users as a result of PIP implementation. If economic displacement will be identified during the screening, a further action plan will be developed in accord with EBRD requirements to minimise impacts by devising appropriate mitigation measures and assuring compensation where needed. All the land users will be consulted with. It is expected that most of the affected land users and their families will benefit from the replacement of water supply networks.

3.4 Tariff Affordability

An affordability analysis was carried out within the framework of feasibility study for water and wastewater systems modernization project in the Horezm oblast.

The EBRD affordability methodology has been applied, which defines affordability as “share of monthly household income/expenditure spent on utility bills”. The EBRD methodology applies different threshold levels for different utility services. For water and wastewater utility services threshold level of 5.0% is used, implying that tariffs resulting in household payments of more than 5.0% of household income/expenditure are considered unaffordable and, potentially, leading to decreased collection and increased water utility accounts receivables.

Based on the analysis for this project, it is expected that tariffs will not pose affordability constraints on households, as the expenditure for average income household is below 0.83% during the highest year and substantially lower than the 5% threshold. It will be important that information about the tariffs will be distributed to the households in a timely manner and that there will be a clear link between the tariffs and the delivery of improved services.

4 Summary of ESAP

According to the Environmental and Social Policy of the EBRD, an Environmental and Social Action Plan (ESAP) should be developed for and implemented during the Project in order to ensure implementation of the project according to the EBRD Performance Requirements (PRs).

The ESAP prepared for the propose Project is related to the modernization of the water supply and wastewater system and includes the programs and systems to address the environmental and social impacts with allocated timeframes, responsibilities and resources required.

Main measures included in the ESAP are measures to enhance environmental and health and safety management systems and interaction with contractors, measures to ensure better quality of environmental monitoring and water quality monitoring, measures to ensure safe operation of the facilities and others.

The ESAP requires the Company to implement a number of improvements designed to meet the EBRD's PRs. The key ESAP actions are related to:

- Horezm WSWW Priority Investment Programme require preparation of separate EIAs, Design for Maximum Permissible Discharges (MPD) under the national legislation. The Company will complete that and obtain the necessary construction and environmental approvals and permits (including water abstraction permit after the hydrogeological survey) prior to start of any activities. EHSSM Plan will include preparation of a checklist of permits for ensuring legal compliance to be used during inspections and audits.
- Company and PIU will employ suitable qualified EHS (Environmental and H&S) Manager, Environmental Specialist (or Environmental Engineer) and Social (Labour & stakeholder engagement) Manager to oversee implementation of legal and EBRD E&S requirements and implementation of this ESAP at planning, tendering and construction stage
- Company will develop EHS procedures and instructions based on the notes and recommendations of the best international practices that can be applied in the frame of RUz legislation and circulate it through the Company.
- Company will need to assign relevant budget for tasks related to environmental issues in a separate block in annual planning.
- standardized clauses specifying that all contractors shall comply with the Environmental, Social, Labour, and Health and Safety requirements (including development of “Construction Environmental Management and Monitoring Programme” (CEMMP)) as described in the requirements of the Uzbek legislation, best international practices and ESAP will be developed and integrated into the tender documents and new contracts.

- > contractors monitoring programme will be developed and implemented which will include briefing Contractors on the Project EHSS and labour requirements, and regular checks on their performance to ensure compliance with the E&S requirements.
- > formalised HR policy and procedures/supporting documentation including “feedback” procedures and internal grievance mechanism in order to enable employees and non-employee workers including construction workers and other relevant workers to present their proposals on working conditions improvement as well as to submit their complaints will be developed as part of ESAP.
- > including H&S clauses about briefing/training Contractors on the Project EHSS and labour requirements, and regular checks through inspections and audits on their performance to ensure compliance with the E&S requirements.
- > ESAP implementation will include “feedback” procedures and internal grievance mechanism in order to enable employees and non-employee workers including construction workers and other relevant workers to present their proposals on working conditions improvement as well as to submit their complaints.
- > program aimed to reduce cases of the secondary bacterial contamination of water even in remote areas, including residual chlorine concentration monitoring on the network, additional chlorination after the planned and emergency works will be part of ESAP.
- > actions aimed to prevent spreading of asbestos containing dust, especially during demolition of structures and excavation of old pipes, development of procedure for the handling of asbestos wastes will be the part of H&S actions.
- > development of tariff structure that would provide for the guaranteed subsidies to contain the tariff growth to the acceptable levels and implement a monitoring system to ensure affordability to low-income and vulnerable groups.

The ESAP includes the environmental and social management systems and measures to be implemented:

- > by the Project Implementation Unit (PIU) during the design phase (preparation of documentation, procurement of works, and procurement of equipment from suppliers);
- > by the PIU and contractors during construction works;
- > by the Company during operation of the water supply and wastewater treatment system.

5 Proposed engagement of stakeholders

5.1 Who are the stakeholders?

The stakeholders are the organisations, institutes and individuals who are responsible for, interested in or affected by the proposed Project. The employees of the Company are the internal stakeholders of the Project. Other parties are the external stakeholders.

5.2 How and when are the stakeholders engaged?

The Project Implementation Unit (PIU) will be established within the Project Implementation Agency (Ministry of Housing and Communal Services) during project planning and construction phase. The PIU will make sure that the Uzbek governmental agencies, local community organisations, the mass media and the general public including men and women and vulnerable people are informed about the Project and can participate in the process of identifying and communicating issues of concern, and in an analysis of the Project. The Project related information and consultation activities will be also carried out during all other phases of the Project preparation and implementation, so that concerns of people potentially affected by the Project could be known and addressed.

The information provided about the Project should be sufficient at least for describing what changes will be caused by the Project, where and when these changes are expected.

A lot of information about the Project preparation was provided to stakeholders during the Feasibility Study and the Environmental and Social Due Diligence. Draft Stakeholder Engagement Plan (SEP) was prepared and will be disclosed. The PIU will update the SEP and use it as an instrument for planning and recording of the public information and consultation activities. The updated versions will be disclosed.

Claims of persons and companies are to be submitted at:

15 Al-Beruni street, Urgench city, Horezm region, Uzbekistan, tel: +998 (62) 2263026, 2268080;

1 Niyozbek Yuli street, Tashkent City, 100035, Uzbekistan, tel: +99871 234-07-28; +99871 234-06-08

email: info@mjko.uz web-site: <http://mjko.uz> attention to: Mr. Sevar Astanov;

5.3 Grievance mechanisms for stakeholders

At the stage of construction and operation of the Project facilities the comments, questions and possible complaints will be addressed within the grievance mechanism. The Project Stakeholder

Engagement Plan includes special mechanism for receiving and addressing the grievances from the external stakeholders during the Project implementation. This grievance mechanism will be based on written forms, which can be filled in by any affected person or organisation and submitted to the SUE “Department of Operation of Interregional Water Main “Tuyamuyun-Urgench” of Horezm oblast or the Project Implementation Unit in Urgench city, who will take action, if required, and inform the author of grievance on the action taken in response to the submitted grievance within 30 days.