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BUKHARA WATER SUPPLY AND SEWERAGE PROJECT PHASE 1

COMPONENT 2: SEWERAGE

[BWSP/QCBS-S/02]



Environmental and Social Impact Assessment: Sewerage System Project in Ramitan District Centre

August 2025

DEVELOPMENT AND MODERNIZATION OF THE SEWERAGE SYSTEM IN GIJDUVAN, RAMITAN, KARAKUL, ALAT AND KARAULBAZAR DISTRICT CENTRES OF BUKHARA REGION (1ST PRIORITY).

COMPONENT 2: SEWERAGE

BWSP/QCBS-S/02

DRAFT

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT:

SEWERAGE SYSTEM PROJECT IN RAMITAN DISTRICT CENTRE

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August 2025

PROJECT NO. 20914					
Revision	**Reason for Revision**	**Prepared by**	**Reviewed by**	**Approved by**	**Issue Date**
-	First Draft	RMcI	DG, KF	MA	18.02.2025
A	Second Draft – Addressing Su-Yapi (AIIB) Comments	RMcI	DG, KF	MA	18.06.2025
B	Final Draft – Addressing AIIB Comments	RMcI	DG, KF	MA	06.08.2025
C					
D					

EXECUTIVE SUMMARY

Introduction

This Environmental and Social Impact Assessment (ESIA) has been prepared in relation to a planned strategic investment in wastewater infrastructure within the Bukhara Region of the Republic of Uzbekistan, a land-locked country located in Central Asia. The wastewater infrastructure investment will enhance overall urban and climate resilience, in accordance with the National Development Strategy 2022-2026.

In addition, the wastewater infrastructure investment project supports the monitoring and delivery of the UN Sustainable Development Goals (UN SDGs) - SDG5 Gender Equality, SDG13 Climate Action and, in particular, SDG6 Clean Water and Sanitation.

At present, the majority of residents in the Bukhara Region rely on basic sanitation systems, such as cesspools and septic tanks. In addition, due to the lack of a centralised sewerage system, commercial and industrial water users dispose of their wastewater locally, which creates potential environmental, social and economic risks, including risks to human health and economic growth and development.

Nicholas O'Dwyer (referred to hereafter as 'NOD') was appointed in May 2022 to further develop the findings of the Feasibility Study, and to undertake the detailed design for Component 2 of the overall Project (Investment in Sewerage Infrastructure). Component 2 is summarised in Box ES.1 below, N.B. there are three components planned in total.

Box ES.1: Overview of Component 2 Wastewater Infrastructure

***Component 2* - Investment in sewerage infrastructure: Implementation of a centralised sewerage system in district centres, consisting of connections to houses, collectors, pumping stations and mechanical and biological treatment facilities, as well as discharge facilities, in the district centres of Alat, Gijduvan, Karakul, Karaulbazar and Ramitan districts of Bukhara Region.**

The scope of work for this ESIA is the Ramitan District, which includes 113.61 km of sewerage networks in total length, 94.566 km of gravity pipelines and 19.336 km of pressure sewers. The detailed design provides for the construction of 11 SPSs and one wastewater treatment plant (WWTP). The length of house connections to the sewer mains is 34,150 m and the number of house connection manholes is 3,328 in total.

Under the Environmental laws of Uzbekistan, a Draft Environmental Impact Statement (EIS) or ZVOS (see *Annex 1*) is required to be submitted to the State Ecological Committee (hereafter referred to as the Ministry of Ecology, Environmental Protection and Climate Change) and the State Ecological Expertise (hereafter referred to as the Centre for State Ecological Expertise), with the latter agency reviewing and providing "positive or negative conclusion" on the EIS.

A positive conclusion, if issued for the Project, is valid for a maximum period of three years, within which the construction must commence. As with the case of the Ramitan Project, and the other four Sanitation Project towns, the Proponent of the Project needed to update and re-submit the EIS for review and positive conclusion decision again, since there was no commencement of construction within the previous 3-year period.

The latest EIS was officially submitted to environmental authorities and "The Positive Conclusion of the State Ecological Expertise" (in Bukhara region) was obtained on the 17th October 2023 (refer to *Annex 2*) and is valid until 16th October 2026.

Overall Approach and Methodology

The robust assessment process used to assess the environmental and social risks of the project included the following: baseline data collection; risk identification; impact assessment; identifying appropriate mitigation measures; and developing a tabulated ESMP and ESMoP to ensure mitigation

measures are implemented and monitored, as required. The model for the overall approach is illustrated in Figure ES.1 below.

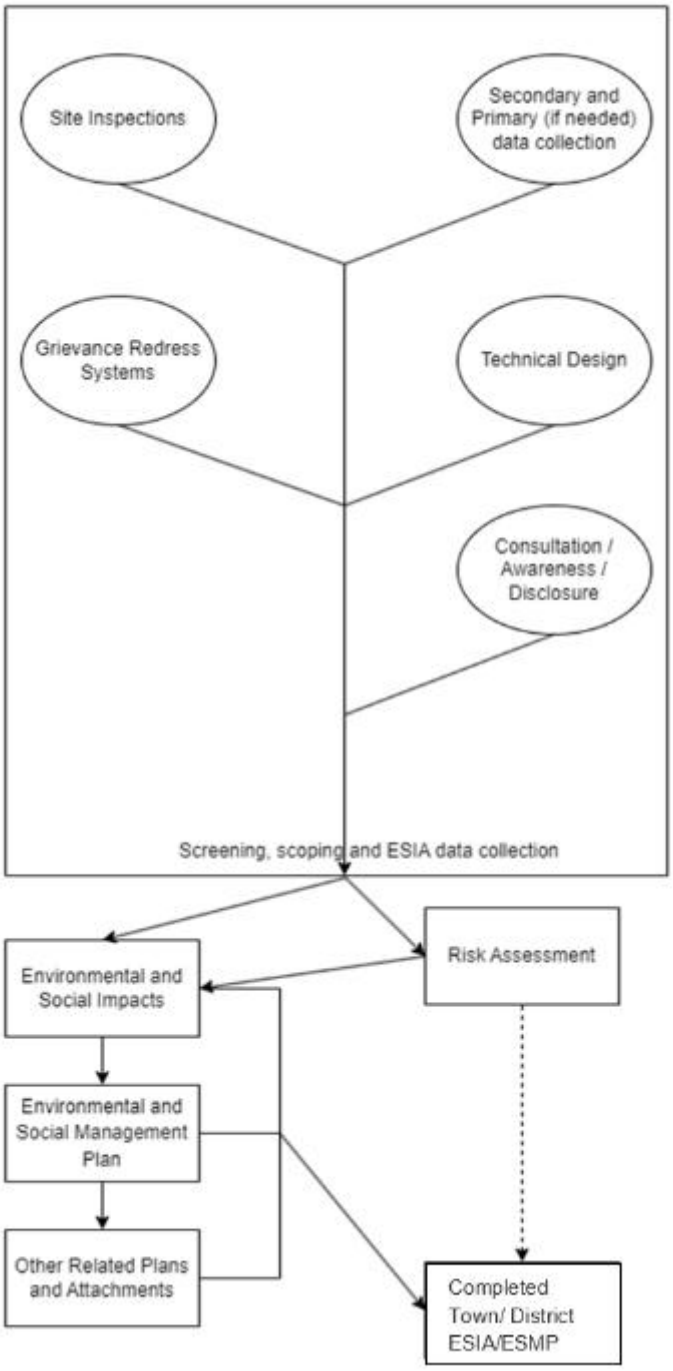


Figure ES.1. Model of Overall Approach to ESIA and ESMP Preparation

In conducting the ESIA, risks that could lead to potential impacts were identified and assessed (as outlined in Section 2 of the ESIA). Where potential significant impacts were identified, including those specific to the Ramitan project, mitigation measures were proposed and significance of residual impacts identified.

Four significance categories (Neutral, Minor, Moderate or Major) have been used to assess each potential environmental and social impact.

Table ES.2. Impact Significance Criteria Matrix

Magnitude / Severity of Likely Impact	Sensitivity of Receptors			
	Negligible	Low	Medium	High
Negligible	Neutral	Neutral	Neutral	Minor
Low	Neutral	Minor	Minor to Moderate	Moderate
Medium	Neutral	Minor to Moderate	Moderate	Major
High	Minor	Moderate	Major	Major

Assessment of Residual Impacts

Following the identification of mitigation measures to address significant adverse effects, an assessment of the significance of any residual effects (i.e. those remaining after mitigation) was completed. Where significant residual impacts remain, consideration has been given to offsetting or compensating for residual impacts.

Assessment of Cumulative Impacts

Cumulative impacts are those effects that may result from the combination of past, present or future actions of existing or planned activities. While a single activity may itself result in an insignificant impact, it may, when combined with other impacts (significant or insignificant) in the same geographical area and occurring at the same time, result in a cumulative impact that is significant.

Project Options & Alternatives Considered

Sewage Pipeline Network and Pumping Stations

Overall, five criteria were applied in the design of the sewage pipeline network and pumping station requirements for Ramitan:

a) Changes in the location of the pipeline and depths based on gravity and pumping stations taking effluent to the WWTP.
b) Reducing land acquisition and resettlement and allowing for the use of easements.
c) Reducing other environmental and social impacts by keeping pipeline alignments as far as practicable on public land, avoiding existing trees/tree plantations and biodiversity, but remaining within the community road alignments.
d) Uzbekistan legal requirements including distance, depth and “angle of crossing” restrictions in cases of existing water supply pipes and other underground, and above ground, utility services Ministry of Construction approval.
e) Uzbekistan’s national legal requirement to obtain Ministry of Construction approval.
f) Under the Ramitan Project, 11 SPSs and one WWTP are planned, based on forecasted numbers of households covered by the pipeline network during the expected sanitation network lifetime, pipeline designs, sewage gravity flows, and the overall need for pressure flows.

Wastewater Treatment Plant (WWTP)

A ‘Multi-Criteria Analysis’ approach (MCA) was undertaken to determine the selected WWTP design.

The MCA was focused on secondary treatment processes only, as it was considered that the preliminary treatment, tertiary treatment and sludge treatment would be similar across all technology options. The secondary treatment processes considered as part of the MCA are listed below:

- Conventional activated sludge (CAS)
- Sequencing batch reactors (SBRs)

- Membrane Bioreactor (MBR)
- Moving Bed Biofilm Reactor (MBBR)
- Bio-works Technology

Based on the MCA (highest overall score being the most preferable option), the Conventional activated sludge (CAS) process was determined to be the most suitable treatment technology for the WWTP.

Recommended Design Selection

The recommended option scenario, on which the technical design was finalized and approved, is to construct a CAS treatment system with tertiary treatment systems, in order to achieve a high standard of treated effluent and to fulfil the requirement on effluent water quality at the collector canal, as required.

Project Description

As mentioned above, NOD was appointed in May 2022 and tasked to further develop the findings of the Feasibility Study and, more specifically, to undertake the detailed design for Component 2 of the Project (Investment in Sewerage Infrastructure). This appointment comprises the detailed design of centralised sewerage systems in each of the five district centres (Alat, Gijduvan, Karakul, Karaulbazar and **Ramitan**), including detailed technical design and five respective Environmental and Social Impact Assessments (ESIAs). NOD will support JSC "UzSuvta'minot", the Project Implementation Entity (PIE), through the Project Coordination Unit (PCU), in the preparation of detailed design documentation for the required strategic wastewater infrastructure.

The proposed centralized sewerage systems to serve these population centres will consist of wastewater collection networks, including sewerage pumping stations, pipelines and house connections, as well as wastewater treatment facilities for each district centre. The treatment facilities will consist of mechanical and biological treatment facilities for wastewater, along with the necessary discharge arrangements and additional processing facilities, as required, to allow the reuse of effluent and/or sludge.

According to the Feasibility Study, Component 2 will involve the construction of five wastewater treatment plants (WWTP), for each of the five district centres mentioned above. Overall, Component 2 will involve 66 new sewage pumping stations (SPS) and the upgrade of 1 existing sewage pumping station (SPS), 613 km of sewer network, and approximately 974 km of household sewer connections. The extent of planned wastewater infrastructure is reflected in the Terms of Reference (ToR), which define the overall scope of consultancy services for this Contract.

The scope of work for this ESIA is the Ramitan District, which includes 113.61 km of sewerage networks in total length, 94.46 km of gravity pipelines and 19.15 km of pressure sewers. The detailed design provides for the construction of 11 SPSs and one WWTP. The length of house connections to the sewer mains is 34,254 m, and the number of house connection manholes is 3,336 in total.

Project Location

The Bukhara Region is located in the southwestern part of Uzbekistan, bordering Turkmenistan, Navoi Region, Kashkadarya Region, a small part of the Khorezm Region, and the Karakalpakstan Republic. The area of the Bukhara Region is 39,400 km^2 with a population of 1.9 million people. This Project incorporates five district centres in the Bukhara Region: Alat, Gijduvan, Karakul, Karaulbazar and **Ramitan**.

The geographical locations of the five district centres, and their proximity to Bukhara city (capital of the Bukhara Region), are illustrated below in Figure ES.2. Figure ES.3 shows the Project in a local context.

Wastewater collected from the territory of Ramitan will be transferred to the new WWTP, which will be built south-west of Ramitan d.c. (site coordinates: North West Corner: 39°53'28.98"N 64°20'11.11"E; North West Corner: 39°53'25.27"N 64°20'19.12"E; South West Corner: 39°53'22.10"N 64°20'5.36"E; South East Corner: 39°53'19.13"N 64°20'11.27"E) on existing ground. The Central Bukhara collector (Zarafshon river) is located to the south-east of the proposed WWTP site. Figure ES.4 displays the planned location of Ramitan WWTP and outfall.

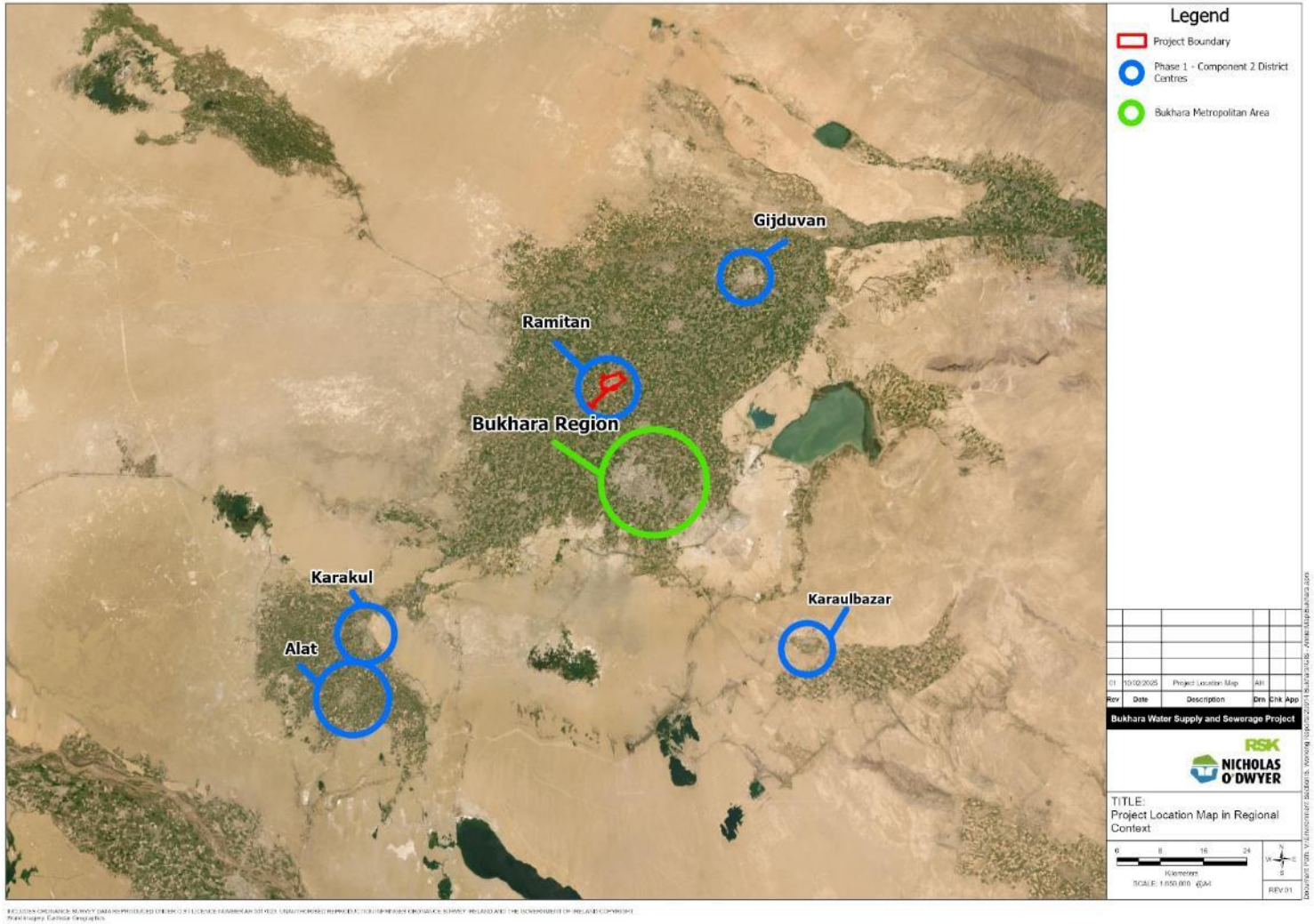


Figure ES.2. Geographical Location of the five project area districts, Bukhara Region

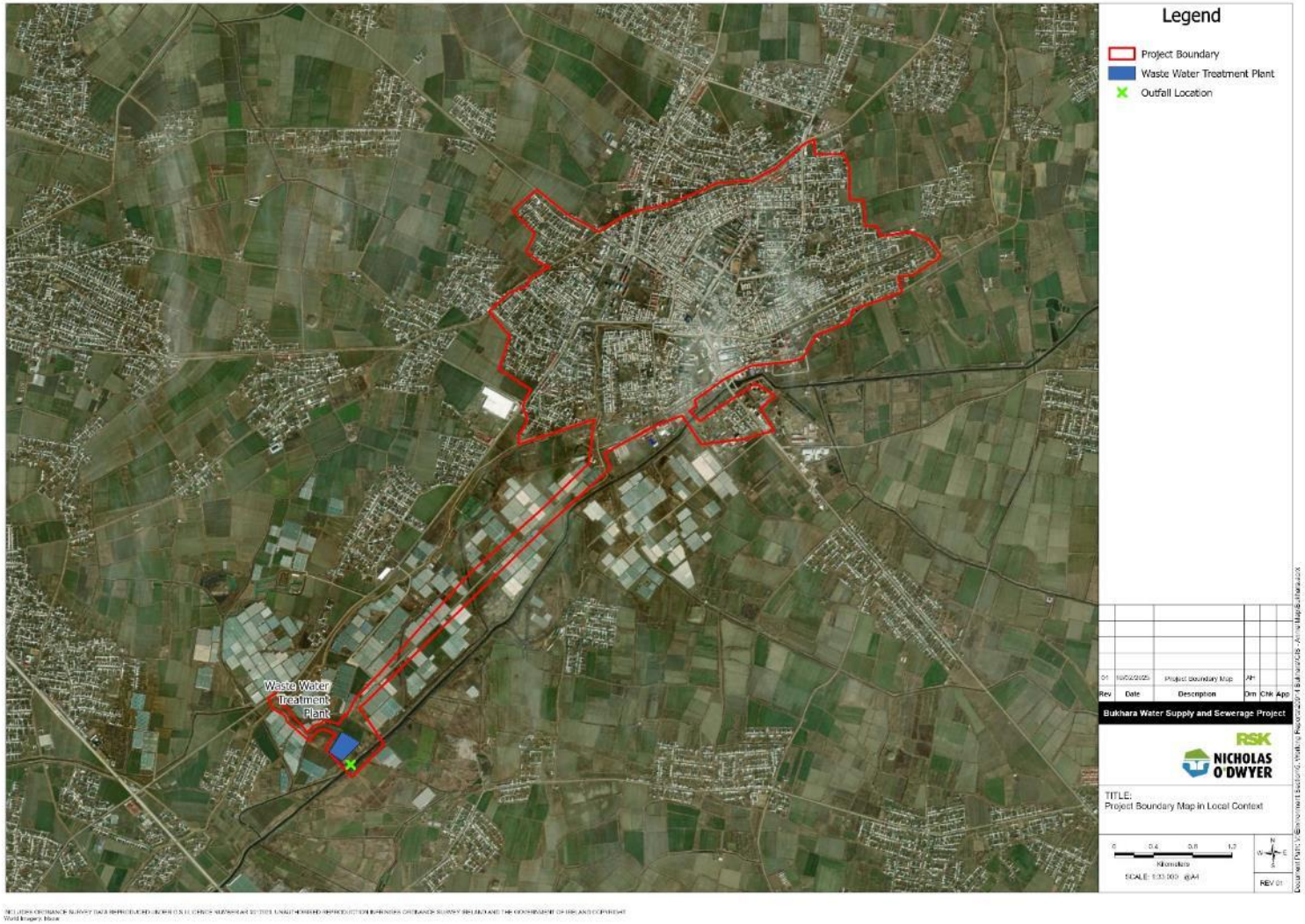


Figure ES.3. Ramitan Project boundary in a local context



Figure ES.4. Location of Ramitan WWTP & Outfall

Policy, Legislative and Institutional Framework

This section of the ESIA outlines key laws, policies, legal standards, and institutions that are essential to Environmental and Social safeguards/protection for the planned Project (Component 2). Relevant AIIB policies, the Uzbekistan legal framework and a set of principles recommended for project implementation are also reviewed in this section.

The environmental impact of the proposed Project is regulated by a number of environmental legislative acts and standards of the Republic of Uzbekistan (RUz). The legal framework of Uzbekistan consists of three levels, related to this Project. The first is the Constitution of Uzbekistan (2023), from which all laws and Acts are developed. Second - Laws, Acts, and Presidential Decrees are issued, e.g. PP-436 validation the Program on the Transition to a Green Economy and Ensuring Green Growth in the Republic of Uzbekistan until 2030. Laws/Acts/Decrees are then implemented as legal standards, the third level of the legal framework. This third level is particularly relevant as the framework is regularly reviewed and updated based on the relevant laws.

Uzbekistan's overall policy framework was significantly updated in 2024 and the ESIA reflects the widening and deepening of national policy in relation to environmental, land use/land management (including public consultation), as well as employment and labor law in line with international conventions, e.g. UN Sustainable Development Goals (SDGs) and the CEDAW: Convention of the Elimination of All Forms of Discrimination against Women (1995).

Should the Project be successful in obtaining a Loan for the development of the Bukhara Region Water Supply and Sewerage Project (Components 1, 2 and 3 (BWSSP)) from the AIIB, the Uzbekistan Government is legally bound to comply with AIIB Environmental and Social Framework, which includes environmental and social assessment and management measures in relation to risks and impacts of the Project including Environmental Social Standards 1 and 2 (ESS1 & ESS2). ESS3 (Indigenous Peoples) is not applicable to the Project. To ensure full compliance, this section presents a 'Gap Analysis' between the AIIB Environmental and Social Framework policy and Uzbekistan's policy, legal and institutional framework.

This section therefore establishes the policy context and legal framework for the baseline, grievance and community consultation sections, as well as the environmental and social assessment that is set out in this ESIA.

Environmental Baseline

This section of the ESIA provides a robust baseline of ten environmental factors for the Project area including Climate & Climate Change, Desertification, Land Use and Land Cover, Soil and Geology, Hydrology, Air Quality, Waste Management, and Biodiversity.

Baseline data presented includes an assessment of emerging trends and patterns in relation to the environment of the Bukhara Region, where applicable, e.g. increased drought and heatwaves. This environmental baseline information is valuable to inform the ESIA's mitigation measures for engineering design and build (D&B) when considering issues like construction dust and machine emissions, etc.

According to the environmental baseline, there are no UNESCO World Heritage Sites (WHSs) within 10 km of the Project boundary. A feature of the Silk Roads: Zarafshan-Karakum Corridor (Chor Bakh Necropolis) and the Historic Centre of Bukhara, are located within 20 km of the Project boundary, *ca*. 12.5 km south and *ca*. 13 km south, respectively. One national archaeological monument (Tepa-5, Kharaton village, Ramitan district) has been identified within the Project boundary which is located 4km from the WWTP and 230m from the nearest pumping station.

In relation to Biodiversity, there are no protected areas within the Project area itself. There are a number of protected areas within the wider surrounding area. The nearest protected area is approximately 12.7 km to the northeast (Paykent Natural Monument) and Dengizkul State Wildlife Sanctuary (State) Kumsultan State Wildlife Sanctuary is located approximately 28.5 km to the east of the Project Boundary.

Social Baseline

This section of the ESIA presents preliminary socio-economic and demographic baseline data and a summary review based on available secondary information, site inspections and consultations with stakeholders, and identifies areas of impact, e.g. population, pattern of built environment, gender and age structure, employment levels (by age and gender), protection from gender-based violence, structure of households, etc. In 2022, a sample of household surveys revealed that approximately 61.1% of households consisted of 5 persons and more.

Public health is examined and assessed along with an overview of migration, living standards, e.g. income per capita, GDP growth and composition of the gross territorial product, etc. An overview of the labor market is also provided, which shows a heavy reliance on agriculture, forestry and fisheries. This is particularly important as the environmental baseline in the previous section highlights a growing desertification in the Bukhara Region.

An overview of social infrastructure is also provided including education provision (pre-primary and general) and healthcare centres including the number of hospital facilities operating in the project area of Ramitan.

Water supply in urban and rural areas is also examined as Uzbekistan has been pursuing a policy of providing the population with safe drinking water services for several years. This is reflected in the data which shows that in 2022, 99.2% of households in rural and urban areas used safe drinking water services. In relation to wastewater, it was a very different pattern where it was found that there is no centralised sewerage system in the city of Ramitan, apart from a recent scheme for 4-storey residential buildings in the centre of Ramitan district.

Ramitan is one of the most developed districts of the five project districts in 2024. Manufacturing industries within Ramitan include significant furniture and textile production, and there is also significant industrial activity in the manufacture of motor vehicles, trailers and semi-trailers.

In Uzbekistan, the commissioning of housing and social facilities, through new construction and reconstruction, has been very rapid in recent years. Ramitan has shown the highest rate among the five project districts in volume of construction (1,080.2 billion soums in 2023, an increase from 292.6 billion soums in 2018).

However, while retail trade turnover in the Bukhara Region has been increasing in recent years, Ramitan was third (after Gijduvan and Karakul) in terms of the volume of retail turnover of the five project districts in 2023 at 1,221.9 billion soums. While for foreign trade turnover the import and export amounts have been increasing the trade balance remains at a negative. Market services provided in the republic in January-December 2022 have increased when compared to the preceding year, this is mainly due to the increase in financial services, trade services, communication and information services, education services, accommodation and food services, and real estate services. The inflation rate in the consumer sector of the republic in 2022 was 12.3%. One of the key inflationary factors in 2022 was the rise in food prices. Food and non-alcoholic beverages became more expensive by 15.4%.

Transport services available in the Bukhara Region have been rapidly rising in recent years, which has led to a rise in passenger transportation and passenger turnover. Agriculture in the Bukhara Region has shown an increase in the production of agricultural products with Ramitan producing a total of 3,951.4 billion soums in 2023, an increase from 3,550.7 billion soums in agricultural products in 2022, and 1,554.8 billion soums in 2018.

Grievance Redress Mechanism

Timely and effective redress of stakeholder grievances will bring sustainability in a project's operations. In particular, it will help advocate forming and strengthening relationships between project management and the stakeholder community groups, and bridge gaps to create a common understanding, helping the overall project management operate efficiently and effectively in the area. In order register and

resolve the community's grievances in this process, a Grievance Redress Mechanism (GRM) will be established. The proposed mechanism will be based on two-tier grievance redress committees – at the settlement and project levels. The proposed GRM will help achieve sustainability objectives by dealing with the environmental and social issues of the project on time.

UzSuvta'minot JSC approved a GRM titled "Operational Grievance Management Procedures" for the Bukhara Region Water Supply and Sewerage Project (BRWSSP), which will be used within the Project "Development and modernization of the sewerage system in Gijduvan, **Ramitan**, Karakul, Alat and Karaulbazar district centres of Bukhara region (1st priority)".

The GRM process is summarised as follows:

- Acceptance of grievance
- Registration of grievance
- Screening and acknowledgement
- Statement of complaint/issue
- Data collection and analysis.
- Documentation process.
- Consideration of grievance and identification of solution options.
- Development and selection of resolution options.
- Obtaining confirmation from the plaintiff.
- Development and implementation of an action plan with timeframes.
- Grievance closure and reporting.

Details on the GRM implementation for both the public and employees are discussed in detail in Section 8 of this ESIA.

Community Consultation and Disclosure

The Constitution of the Republic of Uzbekistan guarantees the right of people to information: "All government agencies, public associations and officials of the Republic of Uzbekistan are obliged to provide individuals with the opportunity to familiarize themselves with documents, decisions and other materials affecting their rights and interests". Uzbekistan has also taken significant steps towards joining the UNECE Aarhus Convention.

The AIIB Environmental and Social Framework includes a requirement to make available environmental and social information about the environmental and social risks and impacts in the Project area during preparation and implementation. This should be done in a timely, accessible, gender sensitive and inclusive and culturally appropriate manner, and in a form and language(s) understandable to the project-affected people, other relevant stakeholders who may have specific needs (related to disability, literacy and/or language).

The Project has utilised various communication and public involvement mechanisms, such as consultations in the format of public consultations/hearings, stakeholder meetings, community gatherings/meetings at the mahalla level, focus group discussions with residents and personal meetings with residents (also refer to separate SDDR document).

Consultations were held with relevant officials and employees of the Ramitan District, representatives of district government bodies - cadastre, architecture, ecology and nature conservation, sanitary-epidemiological service, educational institutions, Chairpersons and activists of Mahalla areas, relevant personnel of Bukhoro Suv Ta'minoti JSC and residents of the sub-project area.

Section 9 of this ESIA presents a summary of consultations that have taken place and the requirements for information disclosure. *Annex 3* contains the minutes of consultation meetings, which took place during 2023 and 2024, e.g., in relation to the Tepa-5 national archaeological monument.

Environmental and Social Impact Assessment

Environmental Impact Assessment

Table ES.3 Environmental Risks and Impact Assessment Summary

Potential Impact	Construction/ Operation	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
Climate										
GHG emissions	Construction	Adverse	Local	Short term	Direct & Indirect	Temporary	Irreversible	Moderate	CEMP	Minor
Integrated water resources management	Operation	Beneficial	Regional	Long-term	Direct	Permanent	Irreversible	Major	N/A	Major (beneficial)
Reduction of GHG emissions	Operation	Beneficial	Local	Long term	Direct	Permanent	Irreversible	Major	N/A	Major (beneficial)
GHG emissions	Operation	Adverse	Local	Long-term	Indirect (Scope 2 emissions)	Permanent	Irreversible	Minor	Design measures (embedded mitigation)	Minor
Increased awareness/capacity -building in climate resilience	Operation	Beneficial	Local, Regional, National	Long term	Indirect	Permanent	Irreversible	Major	Communication with key stakeholders on key data sets	Major (beneficial) + SDG13
Soil and Geology										
Loss of soil	Construction	Adverse	Site	Short Term	Direct	Temporary	Reversible	Neutral	N/A	Neutral
Soil sealing	Operation	Adverse	Local	Long Term	Direct	Permanent	Irreversible	Minor to Neutral	None	Minor to Neutral
Soil erosion and Siltation	Construction	Adverse	Local	Short-term	Direct	Temporary	Reversible	Minor	Schedule construction during the period when the	Neutral

Potential Impact	Construction/ Operation	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
									drainage collector is at its lowest volume. During the drainage collector civil works, silt fencing mechanisms, including physical cofferdams will be implemented, as required.	
Water										
Potential surface water contamination	Construction	Adverse	Local	Short-term	Direct	Temporary	Reversible	Moderate	Storage of hazardous liquids/materials in bunded areas Refuelling of plant and vehicles, off site. Spill kits and hydrocarbon adsorbent packs. Training of personnel in the use of this equipment. Risk assessment prior to wet concreting. Wash down and wash out of	Neutral

Potential Impact	Construction/ Operation	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
									concrete transporting vehicles will take place at an appropriate facility off site. Emergency response procedures to be detailed in the CEMP and all personnel working on site will be appropriately trained.	
Potential contamination from improperly managed wastewater produced from the worker accommodation camp and facilities	Construction	Adverse	Local	Short-term	Direct	Temporary	Reversible	Moderate	Temporary wastewater collection systems will be established in camp areas and construction sites and waste will be collected in impermeable septic tanks. The collected wastewater will be extracted by vacuum trucks and transported offsite by a licenced contractor for treatment at the	Neutral

Potential Impact	Construction/ Operation	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
									nearest Wastewater Treatment Plant.	
Potential contamination of surface/groundwater from leaking pipes transporting raw sewage.	Operation	Adverse	Local	Short-term	Direct	Temporary	Reversible	Moderate	Use of PE pipes.	Neutral
Termination of operation of individualised systems and therefore risk of regular spillage/leakage events throughout the town.	Operation	Beneficial	Local	Long term	Direct	Permanent	Irreversible	Major	Not applicable	Major (Beneficial)
Impact on water quality from discharge effluent from the WWTP	Operation	Adverse	Local	Long term	Direct	Permanent	Reversible	Minor	Mitigation embedded in design	Minor
Surface water runoff from the WWTP	Operation	Neutral	Local	Long term	Direct	Permanent	Irreversible	Neutral	Petrol interceptors and silt removal if there is a risk of pollution from fuel spillages or silt discharges	Neutral
Impacts on groundwater	Operation	Beneficial	Regional	Long term	Direct	Permanent	Reversible	Major	Use of PVC pipelines; WWTP including tertiary treatment	Beneficial

Potential Impact	Construction/ Operation	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
Air Quality										
Construction dust emissions	Construction	Adverse	Local	Short Term	Direct	Temporary	Reversible	Medium to High Risk	CEMP / ESMP	Minor to no significant effect (neutral)
Traffic emissions from construction vehicles	Construction	Adverse	Local	Short Term	Direct	Temporary	Reversible	Minor to Moderate	CEMP	Minor to no significant effect (neutral)
Dust Nuisance	Operation	Adverse	Local	Long Term	Direct	Temporary	Reversible	Low Risk	Standard, best practice measures	No significant effect
Traffic emissions from maintenance vehicles	Operation	Adverse	Local	Long Term	Direct	Temporary	Reversible	Low Risk	Standard, best practice measures	No significant effect
Odour	Operation	Neutral	Local	Long term	Direct	Permanent	Reversible	Neutral	Embedded measures	Neutral
Noise										
Construction noise & vibration	Construction	Adverse	Local	Short Term	Direct	Temporary	Reversible	Moderate to Major	ESMP	Minor to moderate
WWTP Equipment Noise (e.g., blowers, progressive, cavity pumps, centrifuge decanter)	Operation	Adverse	Local	Long Term	Direct	Permanent	Irreversible	Minor	Compliance with the Noise Standard limit in the Schedule of Performance Standards Engineering design abatement measures for noisy equipment items	Minor
Archaeology and Cultural Heritage										
Damage to heritage assets	Construction	Adverse	Local	Long Term	Direct	Permanent	Irreversible	Minor to Moderate	Manual trenching in areas where there are narrow streets	No significant impact

Potential Impact	Construction/ Operation	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
									to avoid damage as far as practicable Conclusion of the Uzbekistan Archaeological authorities of Uzbekistan require that an "Archaeological Supervision Report" be prepared and approved prior to construction commencement, in order to avoid and mitigate any potential adverse impacts. It is recommended that this be prepared by the PMC, to ensure consistent protection and supervision measures are handled directly between PMC/Employer and Construction Contractor.	
Direct effects on sub-surface archaeological	Construction and	Adverse	Site	Long Term	Direct	Permanent	Irreversible	Neutral to High	Implementation under the	Neutral to Major

Potential Impact	Construction/ Operation	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
remains and above ground unregistered historic structures of architectural and historic interest	maintenance operations where applicable								supervision of archaeology experts Chance Find Procedures are in place as part of ESMP	
Biodiversity										
Loss of habitat & trees	Construction	Adverse	Site	Long Term	Direct	Permanent	Reversible	Major (if loss of trees cannot be avoided)	Compensatory Planting Translocation to an alternative site may be possible through approval of District Environmental Department. Similar approvals for trimming of trees to be obtained. Uzbekistan' legal moratorium on tree cutting shall be followed.	Moderate to Major
Loss/disturbance to species & sites of conservation interest	Construction	Neutral	Site	Long Term	Direct	Permanent	Irreversible	Neutral	N/A	Neutral
Changes to the aquatic environment	Operation	Adverse	Local	Long Term	Direct	Permanent	Reversible	Minor	N/A	Major (Beneficial)
Waste Management										

Potential Impact	Construction/ Operation	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
Risk of Waste Generation and Improper Disposal	Construction	Adverse	Local	Short Term	Direct	Temporary	Reversible	Moderate	Waste Management Plan	Neutral
Waste Generation and Disposal Risks	Operation	Adverse	Local	Long Term	Direct	Permanent	Irreversible	Moderate	Waste Management Plant	Neutral
Waste Reuse and Sustainability	Construction & Operation	Neutral	Local	Long Term	Direct	Permanent	Reversible	Minor	Waste Management Plan following the 3-R's to be implemented before	Neutral
Traffic and Transportation										
Increased traffic to WWTP Site	Construction	Adverse	Local	Short Term	Direct	Temporary	Reversible	Minor	CEMP District authorities have selected roads to be used by all Contractor vehicles entering/exiting sites	Minor
Site Operation and Maintenance Traffic	Operation	Adverse	Local	Short Term	Direct	Permanent	Irreversible	Neutral	N/A	Neutral

Social Impact Assessment

Table ES.4 Social Risks and Impact Assessment Summary

Potential Impact	Construction/ Operation/ Decommissioning	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
Human/Public Health										
Lack of engagement of local population in water sanitation & management	Pre-construction & construction	Adverse	Local Regional	LT	Direct	Permanent	Reversible	Moderate to Major (Adverse)	Strengthen participation through ongoing consultation & monitoring.	Moderate to Major (Beneficial) + SDG6
Removal of health risk from raw sewage entering water bodies	Operation	Beneficial	Local	LT	Direct	Permanent	Reversible	Moderate to Major	N/A	Moderate to Major (Beneficial) + SDG6
Land Acquisition and Site Clearance										
Impact on community/land downers due to pipeline construction	Pre-construction/ Construction	Adverse	Local	ST	Direct	Temporary	Reversible	Minor to Moderate (Adverse)	Preparation of Stakeholder Engagement Plan	Minor (Adverse)
Delay to permits and Impact on community	Pre-construction/ Construction	Adverse	Local	ST	Indirect	Temporary	Reversible	Minor to Moderate (Adverse	Preparation of Regulations and Permits	Minor (Beneficial)

Potential Impact	Construction/ Operation/ Decommissioning	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
									Plan as part of ESIA/ESMP	
Property and business access										
Obstruction of access to businesses	Construction	Adverse	Local	ST	Direct	Temporary	Reversible	Minor to Moderate	Access will be provided during construction phase for local trade.	Minor
Obstruction of access to mosques, clinics, and other social services, etc	Construction	Adverse	Local	ST	Direct	Temporary	Reversible	Moderate to Major	Access will be provided during construction phase for sensitive receptors. Mitigations provide for works to occur outside of regular and special events occurring in these areas	Minor
Public safety										

Potential Impact	Construction/ Operation/ Decommissioning	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
Injury to the public and residents in the local area	Construction	Adverse	Local	ST	Direct	Temporary	Reversible	Minor to Moderate	Erection and maintenance of barricades and fencing to legal standards. ESMP plus Emergency Preparedness and Response Plan plus Occupational H&S Plan.	Minor
Potential leaks re. Water quality, Air and/or Noise pollution from Project/WWTP	Operation	Adverse	Local	ST	Direct	Temporary	Reversible	Minor to Moderate (Adverse	Advanced monitoring systems for water quality, air, noise including SCADA system.	Neutral to Minor
Damage to existing structures										
Threat to structures and buildings in the project area	Construction	Adverse	Local	ST	Direct	Permanent	Reversible (depending on survey results)	Moderate	*Adherence to Sanitary Protection Zones, "[Building] Crack*	Minor

Potential Impact	Construction/ Operation/ Decommissioning	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
									Surveys" and Third Party Insurance cover by Contractor.	
Income and Employment										
Employment of local labor	Construction / Operation	Beneficial	Local	ST /LT	Direct	Temporary	Reversible	Minor	Transparent recruitment policy plans, ESMP, etc.	Minor – (beneficial)
Loss of employment for local workers and households / Breach of human rights	Construction using underage labor or persons that are victims of human trafficking. At construction completion – there may be reduced labor demand, leading to local and non-local construction labor moving out of the District to other	Adverse	Local	ST	Direct	Temporary	Reversible	Major	Transparent recruitment policy and plans, Training of worker in managing OHS and Human Trafficking risks, ESMP etc.	Neutral

Potential Impact	Construction/ Operation/ Decommissioning	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
	promising work opportunities – Situation opens up to potential Human Trafficking recruitment.									
Loss of employment in the local farming sector	Construction	Adverse	Local	ST	Direct	Temporary	Reversible	Moderate (adverse)	Planned Phased construction in consultation with local farming sector.	Moderate (beneficial)
Gender Equality										
Gender Bias and gender-based violence (GBV)	Construction	Beneficial	Local	ST	Direct	Temporary	Reversible	Moderate to Major	*Target: 15% Female Employment throughout the Project.* GBV measures follow the policy definitions of AIIB & the World Bank. A well-resourced	Moderate to Major – (Beneficial) + SDG5

Potential Impact	Construction/ Operation/ Decommissioning	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
									Gender Action Plan (GAP) will be designed & implemented. ESMP to contain a specific set of GBV-related mitigations and monitoring of Contractor staff on "core labor issues" that relates to Gender. No Child Labor[1] to be employed on the project (i.e. less than 16 yrs).	
Gender – greater equality & economic	Construction	Beneficial	Local/Regional	LT	Direct & Indirect	Permanent	Reversible	Moderate to Major	Target: 15% Female Employment throughout the Project.	Moderate to Major – (Beneficial) + SDG5

Potential Impact	Construction/ Operation/ Decommissioning	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
integration of women									Management bodies of JSC "Bukhoro Suv Ta'minoti" should adopt a gender-positive policy.	
Occupational Health & Safety										
Risk to labor due to water logging during excavation	Construction	Adverse	Site	ST	Direct	Temporary	Reversible	Minor to Moderate	Excavation to take place during drier seasons, H&S training & instruction, etc.	Minor
Labor and Working conditions	Construction	Neutral-Adverse	Local	ST	Direct	Temporary	Reversible	Moderate to Major	Compliance with National Labor Code, GIIP. Preparation of ESMP including a Labor Management Plan and training on community awareness and accountability.	Minor to moderate (Beneficial)

Potential Impact	Construction/ Operation/ Decommissioning	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
Labour Influx and Mangement										
Influx of labor and workers in camps	Construction	Adverse	Local	ST	Direct	Temporary	Reversible	Moderate to Major	Labour and Community H&S Plan covering worker and community health and safety shall also be prepared separately to the ESMP requirement.	Minor to Moderate
Influx of workers operating the WWTP	Operation	Adverse	Local	MT	Direct	Permanent	Reversible	Moderate	Health and Safety Plan, which is a part of the Community and Worker Health and Safety Plan.	Minor to Moderate
HIV/AIDS and Human Trafficking										
Increased Incidences of HIV/AIDS/Human Trafficking	Construction	Adverse	Local	ST	Indirect	Temporary	Irreversible	Moderate	ESMP and regular training of workers.	Minor

Environmental and Social Management Plan (ESMP)

An Environmental and Social Management Plan (ESMP) has been developed using an approach, based on an assumed engineering requirement in construction and operation requirements. The ESMP presents the following information for action during each of the pre-construction, construction and operational phases:

- Identify key impact areas.
- Propose mitigation measures minimizing the magnitude of impact generation due to project implementation.
- Recommend measures which will reduce each environmental and social impact considered to be significant enough to require a degree of control.
- Comply with all the environmental laws and regulations of the GUz and AIIB safeguards policy requirements, inclusive of international standards.
- Develop a monitoring plan which will:
- Establish baseline conditions for comparison purposes.
- Monitor the performance of the Project and effectiveness of mitigation measures.
- Determine compliance with regulatory framework.
- Provide for remedial actions in cases where monitoring identifies a shortfall in targets for which corrective action is possible.
- Achieve sustainable and environmentally and socially acceptable development interventions for the Project.
- Inform GUz, PCU, and AIIB, the implementation detailed design and supervision consultants and the construction contractors on environmental, social and health and safety management strategies.

To achieve the above objectives, the following have been considered during the formulation of the ESMP:

- Outlining measures to be adopted in project planning and design to avoid or minimize adverse impacts on the environment and affected communities.
- Formulating specific mitigation measures to avoid or minimize the adverse impacts of pre-construction, construction, and post-construction phases of the Project.
- Preparing a plan to monitor the implementation of the mitigation measures and their effectiveness in combating the adverse impacts.
- Establishing an institutional mechanism for ESMP implementation, monitoring, and reporting.

Environmental and Social Monitoring Plan (ESMoP)

An Environmental and Social Monitoring Plan (ESMoP) has been, designed to follow on from the ESMP in Section 11. The ESMoP includes a set of Key Performance Indicators (KPIs) that the Construction Contractors shall aim to achieve throughout the contract period and provide updates on same as part of the HSE sections of the Contractor's Monthly Progress Reporting. These may be adjusted by the Employer, contractor, supervision engineer, PCU and external monitor at the time of the construction contracts being awarded. However, it is assumed that regular measurement for the Project Performance will need to occur on a weekly, monthly, annually, and cumulative basis.

Institutional Arrangements

JSC “UzSuvta’minot”, as the PIE, is responsible for all aspects of the project implementation and ultimately answerable to the Ministry of Investment of the Republic of Uzbekistan and the AIIB, with the Project Coordination Unit (PCU) tasked with day-to-day management of the project, including regular liaison with the AIIB and monitoring of contact with consultants and contractors.

A Construction Supervision Consultant has been appointed by the PIE and works in close cooperation with PCU. Part of their role is to ensure the ESIA and ESMP requirements are fully implemented on site, in addition to technical aspects of the construction contracts.

Environmental and Social Training

The final chapter of the ESIA details that a training and capacity building assessment will be carried out to ensure that all stakeholder groups, including Government officers, NGO workers and construction management and supervision consultants, have the relevant competence with respect to environmental, social and health and safety aspects (ESHS) of the Project.

To this end, a Training Needs Assessment (TNA) will be carried out as a first step.

This will allow training in E&S safeguards implementation to be conducted from the necessary levels compatible with the stakeholders. The recommended training approach is an in-person, lecture-style approach.

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LIST OF ABBREVIATIONS

AIIB	Asian Infrastructure Investment Bank
AoI	Area of Influence
BIM	Building Information Modelling
BoQ	Bill of Quantities
CAS	Conventional Activated Sludge
CCRA	Climate Change Risk Assessment
CEMP	Construction Environmental Management Plan (*Live* doc)
CET	Cavitation and Enzyme Treatment
EMP	Emergency Management Plan
EPA	Environmental Protection Authority
ERP	Emergency Response Plan
ESF	Environmental and Social Framework
ESHS	Environmental, Social and Health and Safety
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMoP	Environmental and Social Monitoring Plan
ESMPF	Environment and Social Management Planning Framework
ESMMP	Environmental, Social Management and Monitoring Plan
FIDIC	Fédération Internationale des Ingénieurs-Conseils (International Federation of Consulting Engineers[2])
FS	Feasibility Study
FSR	Feasibility Study Report
GAP	Gender Action Plan
GBV	Gender-based Violence
GHG	Greenhouse Gases
GRM	Grievance Redress Mechanism
IAQM	Institute of Air Quality Management
IFC	International Finance Corporation
l/c/d	Litres per capita per day
MCA	Multi-Criteria Analysis
MSG	Mahalla Citizens Gatherings
NGO	Non-Governmental Organisation
O&M	Operation and Maintenance
OSEC	On-site Electro-Chlorination
PAP	Project Affected Person
PCU	Project Coordination Unit
PIE	Project Implementation Entity

[2] FIDIC | International Federation of Consulting Engineers | The Global Voice of Consulting Engineers

PIM	Project Information Management System
PIU	Project Implementation Unit
PS	Pump Station
PSDP	Project Supervisor Design Process
RAP	Resettlement Action Plan
RP	Resettlement Plan
RCM	Resolution of Cabinet of Ministers
RPF	Resettlement Planning Framework
RUz	Republic of Uzbekistan
SBR	Sequencing Batch Reactor
SCADA	Supervisory Control and Data Acquisition
SDDR	Social Due Diligence Report
SDG/SDGs	Sustainable Development Goal/Sustainable Development Goals
SEE	Statement of Environmental Effects
SMP	Standards Methods and Procedures
SPS	Sewage Pumping Station
SQE	Safety, Quality and Environmental Systems
SRT	Standard Retention Time
STP	Sludge Treatment Plant
SUE	State Unitary Enterprises
THM	Trihalomethanes
TNA	Training Needs Assessment
ToR	Terms of Reference
UDDS	Unified Design Documentation System
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UVT	Ultra-violet Transmittance
UWSSP	Urban Water Supply and Sanitation Project
UWWD	Urban Waste Water Directive
WB/WBG	World Bank/World Bank Group
WHS	UNESCO World Heritage Site
WWTP	Wastewater Treatment Plant
ZEP	Final Environmental Impact Assessment
ZVOS	Draft Environmental Impact Statement/EIS

1 INTRODUCTION

1.1 Background

The Republic of Uzbekistan (RUz) is a landlocked country located in Central Asia, bordering Kazakhstan to the north, Kyrgyzstan to the northeast, Tajikistan to the southeast, Afghanistan to the south and Turkmenistan to the southwest. With 36 million people, Uzbekistan is already Central Asia's most populous country and is expected to grow to more than 50 million people by 2050[3]. The planned investment in wastewater infrastructure will enhance overall urban and climate resilience, in accordance with the National Development Strategy 2022-2026 and the UN Sustainable Development Goals, e.g. SDG5 Gender Equality, SDG13 Climate Action and, in particular, SDG6 Clean Water and Sanitation.

The distribution of Population Density in Uzbekistan (projected to 2030) is illustrated in Figure 1.1 below.

The Bukhara Region has a population of 169,919 people, from which the Ramitan District has a population of 29,057 inhabitants. Bukhara Region has a population density of 49.97 per km^2 from which Ramitan has 55 persons per km^2.

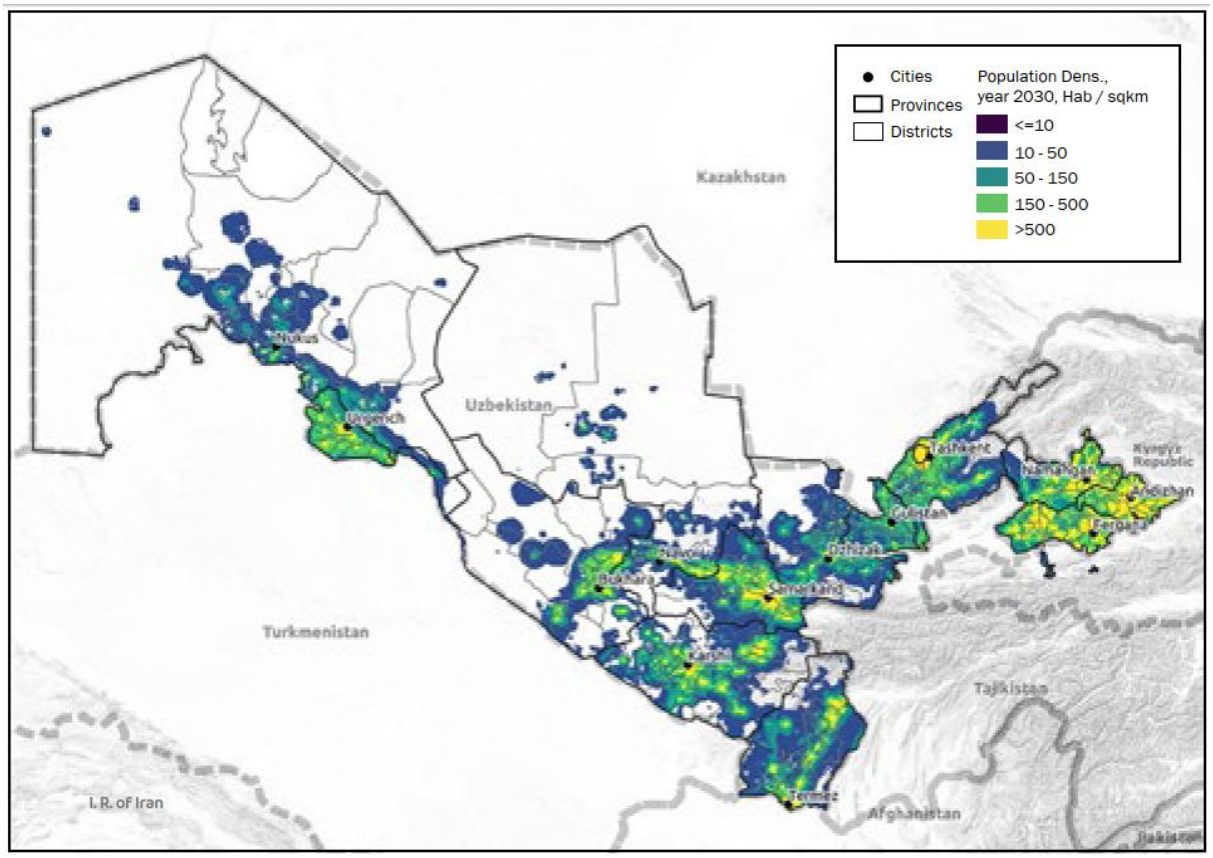


Figure 1.1. Population Density of Uzbekistan (Projected 2030)

The country covers an area of 448,978 km^2, with an average water usage of 51-53 km^3/year, supplied by a combination of surface water (50.9 km^3/year), extraction of groundwater (0.5 km^3/year), and the reuse of collector and drainage water (1.6 km^3/year) (V. Dukhovniy, 2020).

[3] World Bank Group, *Uzbekistan Country Climate and Development Report*, November 2023.

The condition of sanitation infrastructure in rural areas and district town centres is not well documented and has largely been implemented locally on a household or community basis, with little to no centralised wastewater systems in these district centres. As there are no centralised sewage systems, the majority of residents rely on basic sanitation systems, such as cesspools and septic tanks. The state of sanitation infrastructure is equally unsatisfactory for both commercial and institutional premises. Due to the lack of centralised sewerage systems, commercial and industrial water users also dispose of their wastewater locally, which creates potential environmental, social and economic risks, including risks to human health and economic growth and development.

The Government of Uzbekistan intends to increase the population's access in the selected district centres of the Bukhara region, to water supply (currently 54%) and sewerage services (currently 34%) to 100%. In pursuing this goal, the RUz has attracted financing from the Asian Infrastructure Investment Bank (AIIB), which was approved by Resolution of the Cabinet of Ministers (RCM) No. 482 dated August 12, 2020. The agreement was made as a result of Water and Sanitation Feasibility Studies (FS) conducted in 2019. Phase 1 of this goal consists of three component parts:

1) ***Component 1*** - Investment in water infrastructure: Construction and reconstruction of main water pipelines, manholes and water intakes, power lines, water treatment plants, pumping stations, reservoirs, distribution networks, including connection to the house with water meters and equipment in Kagan, Karaulbazar, Ramitan, Peshku, Bukhara, Jandar districts and cities of Bukhara and Kagan, Bukhara region.
2) ***Component 2 -*** Investment in sewerage infrastructure: Implementation of a centralised sewerage system in district centres, consisting of connections to houses, collectors, pumping stations and mechanical and biological treatment facilities, as well as discharge facilities, in the district centres of Gijduvan, Ramitan, Karakul, Alat and Karaulbazar districts of Bukhara Region.
3) ***Component 3*** - Capacity Building, Project Implementation and Management Support.

Under the Bukhara Region Water Supply and Sewerage Project, Phase 1 – Component 2, Investment in Sewerage Infrastructure, the feasibility study (FS) for Component 2, “Development and Modernization of the Sewerage System in Gijduvan, **Ramitan**, Karakul, Alat and Karaulbazar District Centres of Bukhara region (1st Priority)” was developed.

The local operating organisation Bukhoro Suv Ta’minoti JSC (referred hereafter as UzSuvta’minot) is responsible for providing, operating and maintaining the centralised wastewater disposal services from private and commercial customers, within the Bukhara region, including the Ramitan infrastructure and will be participating in the monitoring of project implementation and management support.

Nicholas O’Dwyer (referred to hereafter as NOD) was appointed in May 2022 and tasked to further develop the findings of the FS and, more specifically, to undertake the detailed design for Component 2 of the Project (Investment in Sewerage Infrastructure). This appointment comprises the detailed design of centralised sewerage systems in each of the five district centres, including detailed technical design and five respective Environmental and Social Impact Assessments. NOD will support UzSuvta’minot, the Project Implementation Entity (PIE), through the Project Coordination Unit (PCU), in the preparation of detailed design documentation for the required wastewater infrastructure.

The proposed centralised sewerage systems will consist of wastewater collection networks, including sewerage pumping stations, pipelines and house connections, as well as wastewater treatment facilities for each district centre. The treatment facilities will consist of mechanical and biological treatment facilities for wastewater, along with the necessary discharge arrangements and additional processing facilities as required to allow the reuse of effluent and/or sludge.

According to the FS, Component 2 of the Project (Investment in Sewerage Infrastructure) will involve the construction of 5 wastewater treatment plants (WWTP), for each district centre mentioned above. Overall, Component 2 will involve 66 new sewage pumping stations (SPS) and the upgrade of 1 existing

sewage pumping station (SPS), 613 km of sewer network and approximately 974 km of household sewer connections. The extent of wastewater infrastructure is also reflected in the Terms of Reference (ToR) which define the scope of consultancy services for this Contract.

This investment will ensure better management of increasingly scarce water resources and enhance climate resilience in the Bukhara Region.

1.2 Scope of this ESIA

The scope of work for this ESIA is the Ramitan District[4], which includes 113.61 km of sewerage networks in total length, 94.46 km of gravity pipelines and 19.15 km of pressure sewers. The detailed design provides for the construction of 11 SPSs. The length of house connections to the sewer mains is 34,254 m, and the number of house connection manholes is 3,336 in total.

1.3 Project Location

The Bukhara region is located in the southwestern part of Uzbekistan, bordering Turkmenistan, Navoiy Region, Kashkadarya Region, a small part of the Khorezm Region, and the Karakalpakstan Republic. The area of the Bukhara region is 39,400 km^2 with a population of 1.9 million people. This Project incorporates five district centres in the Bukhara Region: Karaulbazar, Alat**,** Karakul, **Ramitan** and Gijduvan.

The geographical locations of the five district centres associated with ***Component 2***, and their proximity to Bukhara district centre (capital of the Bukhara Region), are illustrated below in Figure 1.2. The project area from January 2018 has 29,057 inhabitants in the **Ramitan** district centre (town). The Project boundary is shown in a local context in Figure 1.3 below and Figure 1.4 Ramitan WWTP and pumping station locations with project boundary

Detailed design for the sewerage pipe network and Sewerage Pumping Stations (SPS) and house connections has been developed in accordance with conditions of the International Federation of Consulting Engineers (FIDIC) Red Book, whereby detailed designs have already been provided for construction. The design concept for the wastewater treatment plant is different and is based on the terms of the FIDIC Yellow Book, whereby the WWTP indicative design is provided, and is then subject to confirmation in Detailed Design by the selected Contractor.

[4] This will be referred to hereafter as the “Project”.

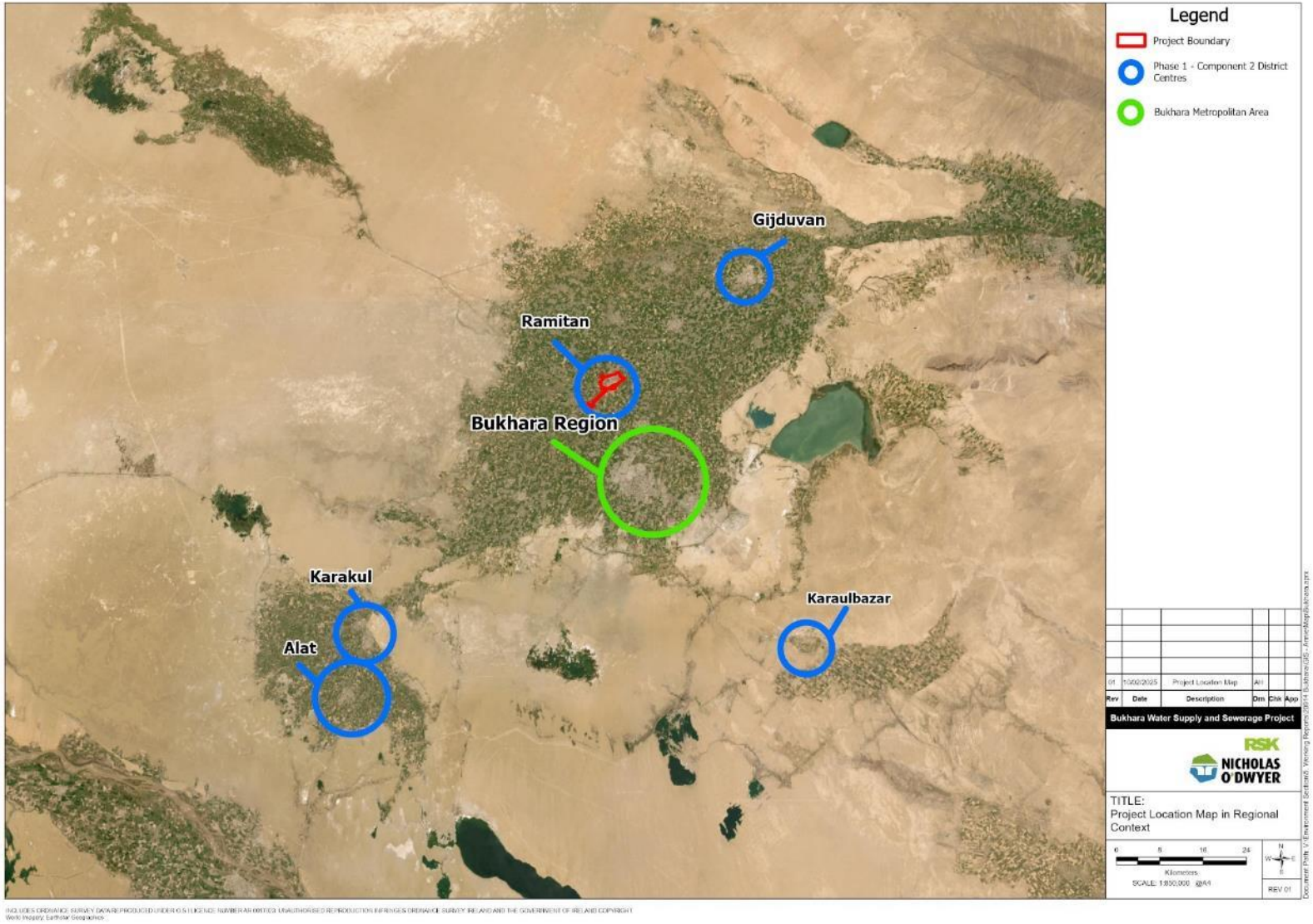


Figure 1.2. Geographical location of the five Project Area Districts, Bukhara Region

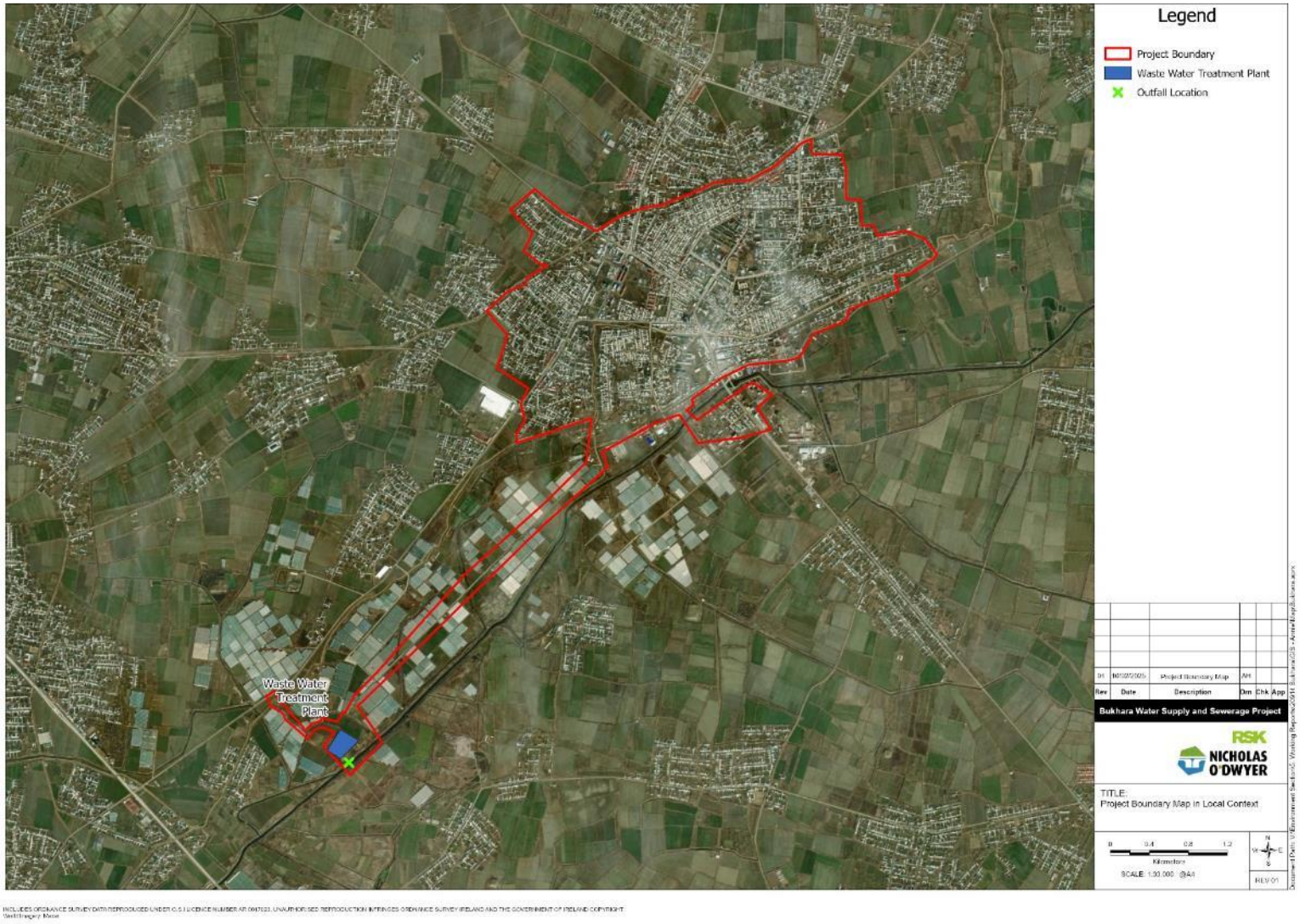


Figure 1.3. Ramitan Project boundary in a Local Context

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1.4 Purpose of the ESIA

The scope of work for this ESIA is required to be at district level, but more specifically focusses on the Ramitan Sanitation Project located in Ramitan city, which is also the administrative centre of the Ramitan district. This document presents the findings of the ESIA of the sanitation sewage pipeline network, pumping stations and wastewater treatment plant proposed for the Ramitan district centre, under AIIB loan financing.

As identified in the Bukhara Region Water Supply and Sewerage Project – Environmental and Social Management Planning Framework (BRWSSP-ESMPF) AIIB Project Document (2022), the Project is classified as a Category A project:

> *The Project is assigned Category A, in accordance with the ESP due to large-scale construction activities spread over a vast geographical area that may have substantial environmental and social impacts.*

During project screening and scoping (carried out in July 2024) it was identified that the Ramitan Sanitation Project is likely to have significant adverse environmental and social impacts during the construction phase due to the extent of the area of intervention. Therefore, in accordance with the Asian Infrastructure Investment Bank's (AIIB's) Environmental and Social Framework (approved 2016, last amended 2024), and the BRWSSP-ESMPF, the Ramitan Project is also classified as a Category A project. Thus, AIIB requires an environmental and social impact assessment (ESIA) and an environmental and social management plan (ESMP) to be included in the ESIA report for the project.

On a local level, in Uzbekistan Environmental legislation, Paragraph 15, RCM of the Republic of Uzbekistan No. 541 dated 07.09.2020, the Ramitan Project is classified as a "Category III" of 4 Categories. As a next step, before Commissioning, the Project Proponent shall develop a Final statement of environmental effects (SEE). All Projects must conduct an EIS (EIS), but all Category I, II and III Projects shall also need a "Final EIS" (ZEP) directly prior to Commissioning.

In accordance with AIIB's ESF, this ESIA report examines the Project's potential environmental and social risks and impacts, both positive and adverse, considers alternatives as appropriate, includes mitigation measures and presents residual impacts once mitigation measures are in place.

1.5 Ramitan EIS and Positive Conclusion of the State Ecological Expertise

Under the Environmental laws of Uzbekistan, it is required that a Draft Environmental Impact Statement (EIS) (refer to *Annex 1*) be submitted to the State Ecological Committee and the State Ecological Expertise, with the latter agency reviewing and providing "positive or negative conclusion" on the EIS.

A positive conclusion, if issued for the Project, is valid for a maximum period of three years, within which the construction must commence. As with the case of the Ramitan Project, and the other four Sanitation Project towns, the Proponent of the Project needed to update and re-submit the EIS for review and positive conclusion decision again, since there was no commencement of construction within the previous 3-year period.

The latest EIS (locally known as ZVOS), was officially submitted to environmental authorities and "The Positive Conclusion of the State Ecological Expertise" for Ramitan was obtained in October 2023. It should be noted that "The Positive Conclusion of the State Ecological Expertise" (*Annex 2*) provides the Uzbekistan legal requirements including:

a) A number of legal standards for the designed infrastructure to operate.

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b) Instruction on how the project is to be monitored on the Ecological Expertise behalf (*i.e.,* The District Ecological Officers of Ramitan).
c) If the environmental impact levels are deemed to be as such, a “Final EIA” (ZEP) will be stipulated and will need to be prepared at the end of construction and a “Positive Conclusion to the ZEP” will need to be obtained before commissioning of the Ramitan Sanitation project.

Note that operations that do not meet Uzbekistan standards may be subject to “polluter pays” fines determined as per Uzbekistan laws.

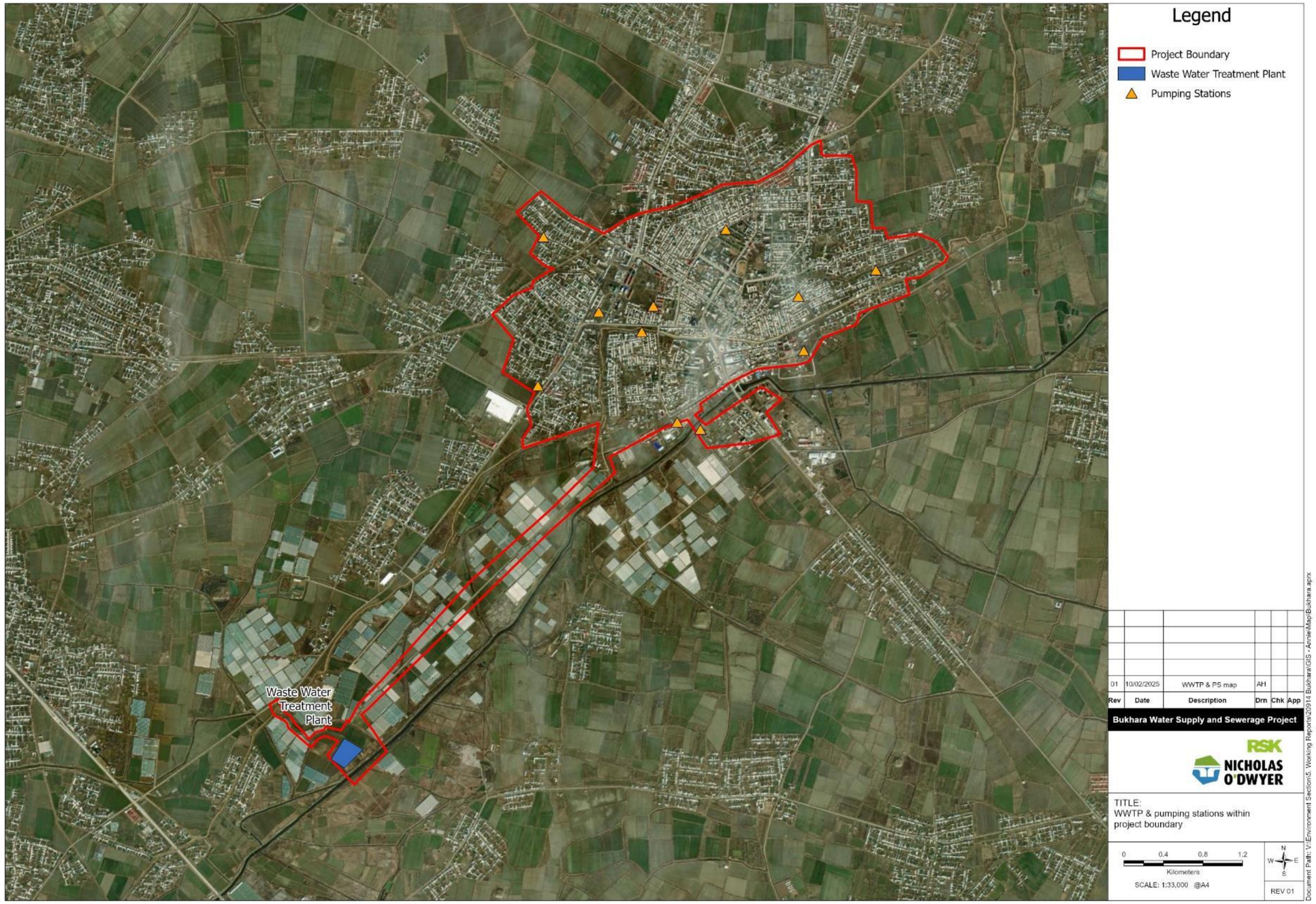


Figure 1.4. Ramitan WWTP and pumping station locations with project boundary

1.6 Structure of the ESIA Report

This Report comprises the following sections, as outlined in Table 1.1.

Table 1.1. ESIA Report Structure

Chapter	Contents
Chapter 1 - Introduction (this Chapter)	An overview of the Project, scope of the ESIA, and structure of this report.
Chapter 2 – Overall approach and Methodology	Describes data gathering methodology and impact assessment methodology.
Chapter 3 – Project Options and Alternatives Considered	Assesses the "Do-Nothing scenario", site location alternatives and design alternatives.
Chapter 4 – Project Description	Description of the proposed facilities and structures, construction methods, and other key aspects of the Project.
Chapter 5 – Policy, Legislative and Institutional Framework	Outlines the relevant legal framework and guidance applicable to the environmental and social aspects of the Project.
Chapter 6 – Environmental Baseline	Description of environmental baseline (pre-Project) conditions.
Chapter 7 – Social Baseline	Description of social baseline (pre-Project) conditions.
Chapter 8 – Grievance Redress Mechanism	Describes the mechanism in place to allow stakeholders to lodge any grievances relating to the project.
Chapter 9 – Community Consultation and Information Disclosure	Describes the extent of stakeholder engagement carried out including list of consultees, dates and type of events. Feedback obtained is included here as well as how it was addressed, as relevant, in the project design.
Chapter 10 – Environmental and Social Risk and Impact Assessment	Presents the findings of the risk assessment and impact assessment carried out to identify potential impacts associated with the project.
Chapter 11 – Environmental and Social Management Plan	Presents the environmental and social management plan (ESMP).
Chapter 12 – Environmental and Social Monitoring Plan	Summary of monitoring requirements for construction and operation (ESMoP).
Chapter 13 – Institutional Arrangements	General recommendation on construction contractor staffing to enable effective implementation of the Ramitan WWTP, SPS and pipeline network.
Chapter 14 – Training	This section outlines the approach to ensure all relevant stakeholder groups have the level of training required to work together on the Project.

2 OVERALL APPROACH AND METHODOLOGY

2.1 General

This section presents a summary of the approach used towards assessing environmental and social risks. The assessment process was based on the following:

- Baseline data collection through:
  - Secondary data collection and analysis (including relevant findings from the Feasibility Study and the EIS)
  - Site inspection
  - Consultations and awareness.
- Risk identification i.e., scoping of potential significant impacts.
- Impact assessment.
- Identification of appropriate mitigation approaches that will minimise potential impacts.
- Development of tabulated ESMP and ESMoP to ensure mitigation is implemented, as required, during construction and operation.

2.2 Data Collection and Analysis

2.2.1 Desktop study

Data for the project area was collected, processed, and analysed. The data collected included:

(i) Meteorological and hydrological including climate risk.
(ii) Other environmental data, including historical and land cover.
(iii) Socio-economic data and reports within the project scope.

Most environmental and social data was collected through technical studies; and existing available secondary data that were held by District and Regional Governments, as well as reports published by the Asian Infrastructure Investment Bank (AIIB) and the World Bank Group.

2.2.2 Field surveys

Several site inspections and surveys were conducted to determine the status of:

- The project area(s), including proposed pumping stations, wastewater treatment plant and pipe network technical engineering designed areas.
- Understanding the types of changes in social and environmental situations, as they appeared on the project site, including the approximate pipeline alignments
- Identify actual areas and sensitive receptors of environmental and/or social impact concern.

2.3 Consultations and Awareness

There were several site consultations and public awareness meetings conducted on-site. This included discussion (formal and informal) with national stakeholders and consultations with regional, district/Hokimiyat, and Mahalla authorities, and local members of the project communities at the project site to collect necessary information for the preparation of the ESIA report of the project. These consultations highlighted the benefits of the Project to the stakeholders as well as any possible negative effects of the Project on the environment and their lives. Feedback received from stakeholders during consultations was captured for inclusion into the project design and the ESIA report.

In addition, several direct exchanges and interviews was conducted with local officials and people about the socio-economic development situation of the locality (refer to separate Social Due Diligence Report (SDDR) and ESIA Chapter 7 Social Baseline below).

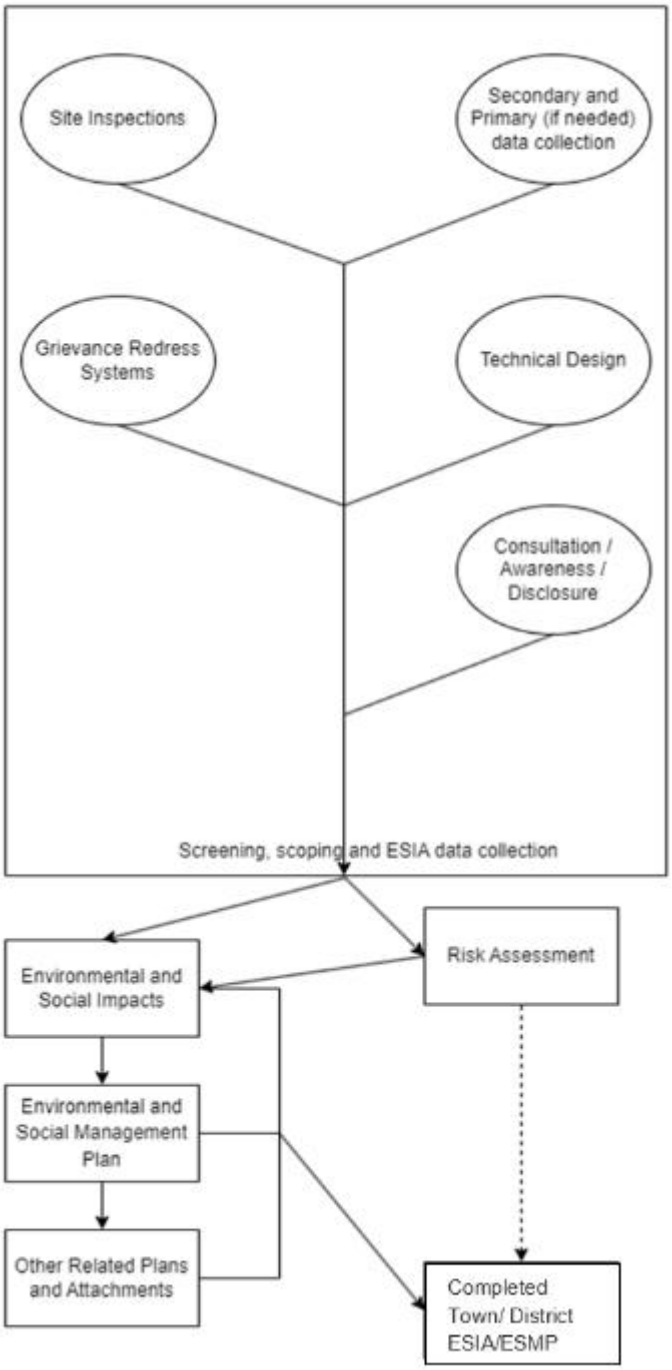


Figure 2.1. Model of Overall Approach to ESIA and ESMP Preparation

2.4 Assessment Methodology

In conducting the ESIA, risks that could lead to potential impacts are identified. The ESIA assigns significance of potential impacts taking into account the likely magnitude (degree of change) and sensitivity of receptor in accordance with the methodology presented in Section 2.4.1.

When considering risk, the following levels of risk are described:

- Negligible – Not susceptible to impact.
- Low Risk – Potential for adverse impacts is minimal or negligible.
- Medium Risk – Potential significant impacts that require mitigation.

- High Risk – A project is likely to generate a wide range of significant adverse impacts on sensitive receptors as a result of its large scale, hazardous nature or the sensitivity of its location.

As mentioned, potential impacts (risk that an impact would occur), were identified and the significance of potential impacts was assessed in accordance with the methodology described in Section 2.4.1 (i.e., consideration of level of severity or magnitude and sensitivity of receptor). The likelihood of occurrence of identified impacts is also considered. Those impacts that are considered likely and potentially significant are assessed (in accordance with the methodology outlined in Section 2.4.1).

The impact assessment provides recommendations in relation to mitigation and/or monitoring required to reduce significance and assesses residual impacts (i.e., those impacts remaining after mitigation is in place). The measures are to be incorporated in the ESIA/ESMP documentation, as well as additional plans and procedures that will need to be prepared at the time of construction commencement or at project operation stage.

N.B. Primary mitigation measures are included as part of the technical design, which are considered during the initial assessment. Secondary mitigation measures are proposed where the assessment has identified the potential for significant effects.

2.4.1 Impact Assessment Methodology

Evaluation of value/sensitivity/vulnerability of resource or receptor

The sensitivity of a receptor is characterised by the receptor's ability to tolerate, adapt to and recover from changes in the environment. Consideration is also given to its value, for example, protected status.

Generic criteria for determining sensitivity of receptors are outlined in Table 2.1.

Table 2.1. Criteria for determining receptor sensitivity

	Bio-physical environment receptor	Social / human environment receptor
Negligible	Not susceptible to impact	Not susceptible to impact
Low	Susceptible to impact A commonly found natural resource; no protection status	Susceptible to impact (e.g., clearly noticeable change to daily life/ habituation reduces disruption over time) A common good / socio-economic resource
Medium	Susceptible to impact that may be reversable, with mitigation. Uncommonly found natural resource; special heritage value; protection status	Susceptible to impact – may be reversable, with mitigation. (e.g., major change to daily life) A rare good / socio-economic resource
High	Susceptible to impact that has serious irreversible consequences. Uncommonly found natural resource; special heritage value; protection status	Susceptible to impact that has serious irreversible consequences (e.g. major change to daily life) A rare good / socio-economic resource

Assessing the level of severity/magnitude of the impact

Level of severity/magnitude is defined as the degree of change to the baseline or receptor as a result of the impact. The magnitude of potential impacts has been categorised as Negligible, Low, Medium or High, see Table 2.2.

Table 2.2: General criteria for determining impact magnitude/severity

Magnitude	Description
Negligible	No perceptible change to the specific natural and social environment condition assessed. Amount of resource or population affected is unnoticeable or immeasurably small.
Low	Small amount of the resource or population is affected; low level of change that is likely within the range of normal variation of background conditions. Detectable but small change to the specific natural and social environment condition assessed.
Medium	Medium amount of the resource or population is affected; generally measurable and observable. Detectable change to the specific natural and social environment conditions assessed.
High	Large amount of the resource or population is affected; easily observable and measurable. Large change to the specific conditions assessed.

Determining Impact Significance

The assessment of significance of impacts should describe whether the impacts are:

- positive, negative or neutral
- direct or indirect
- local, national or transboundary
- short, medium or long-term
- reversible or irreversible
- temporary or permanent
- cumulative in nature

Short-term impacts, in the context of this type of development, relate typically to the construction and decommissioning periods. Impacts lasting less than the lifetime of the Project are considered to be medium-term whilst those exceeding the life of the Project are considered long-term impacts.

The impact identification and assessment process considered (i) baseline conditions and sensitivity (value) of resources/receptors, and (ii) the Project activities as a source of impacts and the degree of change these activities have on the baseline. The criteria for determining impact significance is specific for each environmental and social aspect but generally for each impact, the magnitude of change on the receptor and the sensitivity/value of the receptor is also defined.

Likely impacts have been evaluated considering the interaction between the magnitude of impact and resource/receptor sensitivity criteria as presented in the impact significance matrix in Table 2.3. Four significance categories (Neutral, Minor, Moderate or Major) have been used to assess each environmental and social impact.

Table 2.3: Impact Significance Criteria Matrix

Magnitude / Severity of Likely Impact	Sensitivity of Receptors			
	Negligible	Low	Medium	High
Negligible	Neutral	Neutral	Neutral	Minor
Low	Neutral	Minor	Minor to Moderate	Moderate

Magnitude / Severity of Likely Impact	Sensitivity of Receptors			
	Negligible	Low	Medium	High
Medium	Neutral	Minor to Moderate	Moderate	Major
High	Minor	Moderate	Major	Major

2.4.2 Assessment of Residual Impacts

Following the identification of mitigation measures to address significant adverse effects, an assessment of the significance of any residual effects (i.e. those remaining after mitigation) was completed. Where significant residual impacts remain, consideration has been given to offsetting or compensating for residual impacts.

2.4.3 Assessment of Cumulative Impacts

Cumulative impacts are those effects that may result from the combination of past, present or future actions of existing or planned activities. While a single activity may itself result in an insignificant impact, it may, when combined with other impacts (significant or insignificant) in the same geographical area and occurring at the same time, result in a cumulative impact that is significant.

2.5 Challenges

In preparing this ESIA, some key challenges were encountered. Issues have been addressed as best possible for the Ramitan specific situation and are discussed below.

2.5.1 Technical Design Constraints Identified

As mentioned above, an analysis of constraints, or risks, was conducted. Mitigation measures have been assessed and recommendations provided in Chapters 10 and 11.

2.5.2 Technical Design and ESIA Timing

Notwithstanding Section 2.5.1 above, at this stage of the Project, Screening, Scoping and Risk Assessment processes initiate environmental and social considerations to be included in key technical design features. However, the ESIA and ESMP/ESMoP must be prepared against the technical design and then updated and adjusted against the most accurate, recent and approved technical detailed design, to ensure that mitigation measures are included in construction budgets, as far as is practicable. Any adjustments and late approval requirements to the technical design affects timing for data collection and documentation.

2.5.3 Limits to District Data for Ramitan

A list of environmental and social data required for collection was developed and finalised. The district of Ramitan has limited data available. Certain information could only be obtained through official letters to a higher authorised Ministry level and at a fee to the Proponent.

Social data was captured through consultations, selected social surveys with households and Government officers and through the district “passports”. District passports mostly contain up-to-date social data. General demographic data was most recently updated and is documented in the Ramitan Social Due Diligence Report (SDDR).

Environmental data was collected from various sources, as available, but it should be noted that there were major constraints due to the limited data available. Datasets collected were mainly based on secondary sources, including use of data from the Environment and Social Management Planning Framework (ESMPF).

2.5.4 Payment for Data

Some Provincial and District Government Agencies required payment for data. Given the expense of this district-level data, this ESIA makes use of other available reliable sources. In particular, those environmental datasets that would need to be measured directly before (as a baseline) and during the construction period were obtained from existing data. Climatic and collector canal data were purchased, respectively, from the District Agromet Department and an independent laboratory.

3 PROJECT OPTIONS & ALTERNATIVES CONSIDERED

3.1 General

This section of the ESIA presents the criteria used for selecting the optimum design of the sewage pipeline/pumping stations and WWTP in Ramitan.

3.2 Sewage Pipeline Network and Pumping Stations

The sewage pipeline network design for Ramitan considered several criteria in achieving a design that was deemed appropriate, based on the consultant's professional experience. The following criteria were used in designing the sewage pipeline network and pumping station requirements for Ramitan:

- Changes in the location of the pipeline and depths based on gravity and pumping stations taking effluent to the WWTP.
- Reducing land acquisition and resettlement and allowing for the use of easements.
- Reducing other environmental and social impacts by keeping pipeline alignments as far as practicable on public land, avoiding existing trees/tree plantations and biodiversity, but remaining within the community road alignments.
- Uzbekistan legal requirements including a distance, depth and "angle of crossing" restrictions in cases of existing water supply pipes and other underground, and above ground, utility services Ministry of Construction approval.
- Uzbekistan legal requirement to obtain Ministry of Construction approval.

Under the Project,11 SPSs are now planned, based on forecasted numbers of households covered by the pipeline network during the expected sanitation network lifetime, pipeline designs, sewage gravity flows.

3.3 Wastewater Treatment Plant

This section provides a summary of findings of the alternative technologies considered for the Ramitan WWTP, using a "Multi-Criteria Analysis" (MCA) approach. The selected WWTP design is presented in Section 4 below.

3.3.1 Multi-Criteria Analysis

In January 2023, a wastewater treatment options analysis was completed, in the terms of the Inception Report, to identify the most technically and economically viable solution considering the limited number of wastewater treatment processes capable of meeting the strict discharge criteria in Uzbekistan. Each treatment technology was assessed and assigned a score under capital expenditure (CAPEX), operating expenditure (OPEX), availability of specialists familiar with certain treatment technology on the local labor market, ease of operation and maintenance, environmental and social impact, technical feasibility, examples of similar treatment plants built in the region, and area requirement. It should be noted that the MCA was focused on secondary treatment processes only as it was considered that the preliminary treatment, tertiary treatment and sludge treatment would be similar across all technology options. The secondary treatment processes considered as part of the MCA are listed below:

- Conventional activated sludge (CAS)
- Sequencing batch reactors (SBRs)
- Membrane Bioreactor (MBR)
- Moving Bed Biofilm Reactor (MBBR)
- Bio-works Technology

The options analysis, and subsequent MCA, included undertaking the following steps (Refer to the "Options Analysis Report", 2023, for details of the MCA):

- WWTP technology analysis. A Multi-Criteria Analysis (MCA) was carried out to establish the most suitable treatment process for the proposed WWTPs
- Preliminary budget estimates were prepared under the following three scenarios;
    - Scenario 1: CAPEX and OPEX to achieve discharge standards in line with Urban Wastewater Treatment Regulations;
    - Scenario 2: CAPEX and OPEX to achieve higher quality effluent by utilising tertiary treatment as a polishing step;
    - Scenario 3: CAPEX and OPEX to achieve the standards set out in the FS.

Each of the treatment technologies assessed under MCA and the findings are summarised in Table 3.1.

Table 3.1 Final Weighted Score of Each Process

Criteria	Conventional Activated Sludge	Sequencing Batch Reactors	Membrane Bioreactor	Moving Bed Biofilm Reactor	Bio-works Technology
CAPEX	4.00%	8.00%	2.00%	6.00%	4.00%
OPEX	5.45%	9.09%	1.82%	3.64%	7.27%
Ease of operation and maintenance	8.00%	4.00%	2.00%	6.00%	8.00%
Environmental Impact	5.45%	1.82%	9.09%	3.64%	7.27%
Area requirement	1.00%	2.00%	4.00%	3.00%	1.00%
Technical Feasibility	5.00%	2.00%	1.00%	2.00%	1.00%
Final Score	**28.91%**	26.91%	19.91%	24.27%	**28.55%**

(Source: "Options Analysis Report", 2023)

Based on the MCA (highest overall score being the most preferable option), the Conventional Activated Sludge process was determined to be the most suitable treatment technology. This was based on a balance between CAPEX, OPEX, availability of qualified labor resources, availability of treatment plants with the same treatment technology, complexity of operation and necessity for expensive repair technicians, followed by Bio-works Technology, SBR, MBBR and MBR.

While CAS does not emerge as the most economically feasible option due to its large area requirements and numerous mechanical equipment and instruments, it remains the most common treatment process on the market. The widespread availability of required skills and expertise simplifies the construction, commissioning, and operation of such systems. Additionally, CAS systems are relatively low complexity in terms of operation, meaning that this technology is a reliable and suitable solution for a region where the operations team is in the early stages of development, CAS has also demonstrated its reliability in achieving stringent effluent limits without causing adverse environmental impacts, compared to some of the less established technologies under assessment. The combination of these factors makes CAS the most suitable technology in the specific context of this project.

Bioworks offers features similar to CAS, with the key difference being that it is a patented technology, which limits contractors' willingness to compete and contravenes the fair, competitive bidding process. The design of such technologies is licensed to a limited number of specialists, which contractors have to engage with, limiting their flexibility in procurement and consequently affecting project cost.

Additionally, since it is not a very common process in wastewater treatment, there is a limited number of suitable experts in the market for the operation of this treatment technology. This presents a higher risk of operational underperformance, and consequent adverse environmental impacts, compared to the CAS technology.

SBR is one of the more complex processes in biological treatment. As the name implies, it is a batch process where all the biological activity and settling occur within the same reactor following the fill-react-discharge sequence. It can achieve similar effluent quality to CAS in a smaller footprint; however, the arrangement and sequence of processes require a high level of control, monitoring, and automation systems that demand specialized skills and expertise. Without proper operation and sufficient expertise, the process is prone to failures and can lead to adverse environmental impacts.

MBR and MBBR processes utilize attached growth systems, which require media for bacteria to attach and grow. This arrangement allows for a higher concentration of bacteria within the reactor compared to typical biological processes, leading to greater biological removal. Consequently, they can deliver higher quality effluent in a much smaller footprint. However, these systems come with complex operational requirements and require continuous maintenance of the media or replacement, increasing the overall costs, especially for MBR systems. Poor maintenance of these systems can lead to reduced performance due to biofilm overgrowth and media clogging, potentially resulting in higher concentrations of pollutants in the effluent. In severe cases, it can cause complete system failure, halting the treatment process and resulting in the discharge of inadequately treated wastewater, posing significant environmental and public health risks. making them unsuitable for this project. These technologies would therefore be considered higher risk in the context of a wastewater operations team at an early stage of development.

Recommended Design Selection

The recommended option scenario, on which the technical design was finalised and approved, is to construct a CAS treatment system with tertiary treatment systems in order to achieve a high standard of treated effluent, as per the “Positive Conclusion of the Ecological Expertise” and ZVOS. This option aims to fulfil the requirement on effluent water quality at the collector canal as required in the “Positive Conclusion of the Ecological Expertise” issued in response to the ZVOS (refer to *Annex 2*) and the Melioration Department of the Ministry of Irrigation.

As agreed with the representatives of the PCU (Inception Report and Feasibility Study Review dated 31.01.2023), the effluent standards proposed in the Feasibility Study Report were found too stringent compared to international standards, and it was agreed to use the Uzbekistan legal Fish pond standards instead. These Fishpond standards are similar to, and in some instances even more stringent than, the proposed standards, with more feasible limits on certain pollutants such as suspended solids and nitrates, which are more suitable for the context of the project.

4 PROJECT DESCRIPTION

4.1 Introduction to Existing Condition

The city of Ramitan currently has no centralised sewerage system.

The state of the wastewater sector in Ramitan the city is mainly applied by individual private households or localized systems covering apartment buildings with virtually no centralised sewage disposal or treatment systems in the district centre. Since there is no centralised sewage system, most residents rely on basic sanitation systems such as pit latrines with cesspools and accumulating septic tanks, which incur a cost for sewage collection or relocation and excavation of latrine facilities. The state of sanitation infrastructure is equally unsatisfactory for both commercial and institutional enterprises. Due to the lack of a centralised sewage system, commercial and industrial water users similarly must use localised systems for disposal of sewage and wastewater which also incurs a cost.

An Options Analysis was conducted by NOD (discussed in Section 3 above). The recommended option scenario, on which the technical design was finalised and approved, is the construction of a CAS treatment system with an additional tertiary treatment system in order to achieve an optimised standard of treated effluent. This scenario option was recommended for Ramitan, apart from the “no project” option, because all other options and scenarios were rejected on the grounds of technical, economic, non-trademarked[5] and/or environmental, health and safety, and also considering the “Positive Conclusion of the Ecological Expertise” (*Annex 2*) and advice of the Ministry of Irrigation and Water Resources, Melioration Department, with regards to the collector canal, into which the treated wastewater would flow. This section outlines the chosen option on which this ESIA is focused.

According to the FS, the Detailed Design has been developed for 100% coverage of residential customers with a centralised sewerage system. Based on the “Options Analysis” (January 2023), which included an MCA, the design option chosen assumes that connected customers will discharge, to the centralised sewerage system, 100% of the water consumed (volume of water supply). The volume of water supply (the volume of water supplied to consumers) is adopted as 140 litres per capita per day (l/c/d). The municipal sewerage system will receive wastewater from the population, from public and municipal institutions, household and industrial wastewater from other customers, provided that their composition is similar to household wastewater. The average value of the daily volume of wastewater - 140 l/c/d is adopted in accordance with KMK 2.04.02-97 “Sewerage. External networks and structures" as amended (RUz Architecture and Construction Committee, Order No. 4 of January 25, 2011 on amendments to KMK. 2.04.02-97).

The proposed centralised sewerage system of Ramitan will consist of collection networks including sewerage pump stations, pipelines and house connections. The design has been prepared to provide the level of detail needed for the Ramitan sewage pipe network and pump stations to be tendered in accordance with the FIDIC Red Book, where the design is already prepared and issued as part of the construction contract. A separate design concept has been prepared for the Ramitan wastewater treatment plant in accordance with the FIDIC Yellow Book, which will involve a contractor to design-build the WWTP.

The following project description is based on technical specifications and required performance characteristics, as set by the technical designer and consultant engineers. It has been split into four parts that make up the project physical infrastructure proposed for development, under AIIB financing:

1. Sewer Network
2. Pumping Stations
3. Wastewater Treatment Plant

[5] Trademarked items can reduce the competitiveness of construction contractor bidders, which goes against the FIDIC Contracts systems.

4. Associated facilities - other Infrastructure considerations such as roads, water and electricity utilities, etc.

4.2 The Sewage Pipe Network Design

4.2.1 General

As mentioned above, the length of the sewage pipeline is approximately 113.61 km. The designed sewerage system provides for a scheme of sewer collectors, networks and pumping stations for the disposal of domestic wastewater, from sewage objects to the sewage treatment plant. Figure 4.1 below shows the 11-zone sewer pipe network layout design. The sewerage scheme is designed in consideration of a growing population such as to cover the new city boundary, relief conditions, the order of development, as well as previously completed feasibility studies. Topographically, the project area is mostly flat, with a slight incline, in some areas, of up to a maximum of 1 or 2 meters. It is planned that, apart from gravity sewage, 11 SPSs shall be installed or replaced to work at depths of 5.1 - 8.4 m. The main pumping station will lift the wastewater to the WWTP located on a natural elevated hilltop to the north-east.

Route and calculation of the sewer network was carried out taking into account the carrying capacity of sewer collectors, terrain, distribution of the population and industrial enterprises on the territory of the city. The sewer gravity network is provided by pipes with a diameter of 200-500 mm, relying on pipe diameter changes and minimum gradient to provide the appropriate pressure optimum movement of sewage. The pressure network is provided by pipes with a diameter of 110-400 mm, depending on the pumping stations capacities (refer to Section 4.3 below).

The designed sewer networks include non-metallic sewer pipes, that are not subject to corrosion and therefore shall not contaminate the soil. They also have a long service life (up to 50-years). Along the pipe network route, manholes for inspection and cleaning are to be installed, made of precast or mono-cast reinforced concrete. The pipe will be laid at depths, depending on gravity and pumping station capacity, ranging from 1.1 - 6.0 m.

Sewer lines will be laid within road corridors, preferably at the road shoulder if adequate construction workspace is available, to avoid destruction of pavement and reduction of traffic disruption. The pipes will be laid using an open method. Its main shortcomings are the destruction of road pavements, the disturbance of the landscape with the subsequent need for their restoration, and the disruption of the activities of objects in the construction zone and traffic on highways.

Pipes will be laid on an artificial base (sand) and screened sandy excavated material covering of the pipe, as per engineering technical specification (refer to Bill of Quantities/BoQ). This will be followed by reinstatement of excavated material up to 200 mm below surface compacted in 150 - 200 mm layers, 150 mm of road base material that meets engineering specifications, KMK and GOST standards, also compacted in layers (compaction testing for top layer of reinstated excavated material and road base level to meet engineering standards) and up to 50 mm of Asphalt (Hotmix) to existing road pavement level (after compaction). This approach is regardless of whether the roadway is newly reconstructed or is planned for resurface by the local authorities.

The width of the trench without formwork will be [Pipe diameter + 600mm (but not less than 800mm)] and with formwork will be [Pipe diameter + 1800 mm] not accounting for deep trench health and safety measures and widths of digging machinery and trucks (2.7 - 3.5 meters width per machine). When excavating the trench, another 2.0 - 2.5 meters of territory will be temporarily occupied for moving equipment. Width of the excavation, at surface level, will also be determined based on safety factors, where depth of trenches are more than 1.5 meters, such as sloping or benching and/or shoring, with ladders at regular intervals of approximately 10 to 15 meters (emergency escape ladders within 8 meters) along the deep trench areas.

After completion of the main earthworks, the pipeline laying will be laid including the following actions:

- levelling the trench bottom;

- filling of a pillow for a pipeline made of sand;
- pipe laying;
- trench filling;
- reinstatement of road and landscaping.

Manholes for various purposes are arranged on the sewer network. The minimum manhole depth, up to the tray, is 1.5 m. Inspection manholes are installed at all points of change in the direction of the network (turning), points of pipe connection to each other (nodal), on straight sections after 50 m with a pipe diameter from 160 mm for house connections and from 200 to 500 mm for the network, as well as at all sections of change in slopes and pipe diameters. They are installed from precast reinforced concrete elements. Open trays are arranged inside the manhole at its base. The drop manholes are arranged on alignment with large slopes to ensure an unacceptable velocity of wastewater motion in the pipes.

4.2.2 Sewer Basins

According to the Detailed Design, Ramitan is conditionally divided into 11 sewer basins. The project provides for the construction of a new sewerage system with 11 PS and their service areas (refer to Table 4.2). The SPSs are located at a distance of at least 20 - 30 m from residential and public houses or buildings. Their locations were selected depending on the sanitary, hydrometeorological and topographic conditions of the area and the expected inlet and outlet requirements of the designed sewer pipeline network.

Table 4.1 Locations of the sewer basins of each pumping station on the proposed network

Sewer Basin PS No.	Location Description
Pumping Station No.1	Within in the territory of the Navoi MFY in the western part of the city of Ramitan, between the sewer basins of PS №3 and PS №8 to the north and PS №6 to the east
Pumping Station No.2	Within the territory of the Ramitan MFY in the western part of the city of Ramitan, adjacent to the sewer basin of PS №1 to the east and PS №8 to the north
Pumping Station No.3	Within the territory of the Navoi MFY in the central part of the city of Ramitan, situated between the sewer basins of PS №1 to the south, PS №6 to the east, and PS №4 to the north.
Pumping Station No.4	Within the territory of the Bobur MFY in the central part of the city of Ramitan, adjacent to the sewer basin of PS №5 to the east, PS №10 to the north, PS №1 and PS №3 to the south, and PS №8 to the west
Pumping Station No.5	Within the territory of the Guliston MFY in the central part of the city of Ramitan, adjacent to the sewer basin of PS №11 to the east, PS №10 to the north, PS №6 to the south, and PS №4 to the west.
Pumping Station No.6	Within the territory of the Afrosiab MFY in the southern part of Ramitan city, adjacent to the sewer basin of PS №11 to the east, PS №5 to the north, and PS №1 to the west
Pumping Station No.7	Within the territory of the Navoi MFY in the southern part of Ramitan city, adjacent to the sewer basin of PS №6 to the east and PS №1 to the northwest
Pumping Station No.8	Within the territory of the Bobur MFY in the northwestern part of Ramitan city, adjacent to the sewer basin of PS №4 to the east, PS №10 to the north, PS №2 to the south, and PS №9 to the west
Pumping Station No.9	Within the territory of the Bobur MFY in the northwestern part of Ramitan city, adjacent to the sewer basin of PS №8 to the southeast

Pumping Station No.10	Within the territories of Zaravshan MFY and Ibn Sino MFY in the central part of Ramitan city, adjacent to the sewer basin of PS №5 to the east and PS Nos. 4 and 8 to the southwest
Pumping Station No.11	Within the territory of the Tarnaut MFY in the eastern part of Ramitan city, adjacent to the sewer basin of PS №5 to the north and northwest and PS №6 to the south

4.2.3 Sewer Design Approach

The sewer network consists of pipelines of four categories by function and arrangement:

1. Trunk (main) sewer collects wastewater from the system of submain and street sewers and transports the flow to the wastewater treatment and sludge disposal facilities;
2. Street or “primary” sewer routed along the streets and driveways collects wastewater from the yard and submain sewers to the trunk sewer;
3. Submain or “secondary” sewer at the street block level is intended to serve smaller areas and transport wastewater to the street networks or trunk sewer;
4. Yard or “tertiary” sewer is a section of sewer network that connects internal house networks of specific property with a manhole on a street or submain sewer.

It should be noted that networks design (dimensioning) was carried out using the Sewer GEMS software by Bentley Systems. Also, SCADA system will be implemented for automatic remote control of pumps at the sewerage pump stations.

4.2.4 Sewer Facility

The design has been prepared for construction of:

1. new sewer networks,
2. manholes and house connections to them, and
3. new sewerage pump stations (SPS).

Some network elements are briefly characterised below:

- Gravity street prefabricated sewers and networks from structured wall PE socket pipes with internal diameter of 200–500 mm;
- Pressure pipelines in the networks are designed in two strings of PE100 pipes with a diameter of 160 mm and 400 mm;
- Pressure sewer leading to the WWTP is designed as two strings of PE100 pipes with a diameter of 400 mm;
- Design for the 11 SPSs includes structural analysis, calculations/dimensioning of pumps, control panels, lifting equipment, power supply system automation, transformer substation, diesel generator, electromagnetic flow meter, security fence and access road;
- Customer/house connections to street networks are designed through house manholes with a diameter of 700 mm and 3336 pcs. of connecting pipelines with a length of 34,254 m made of structured wall PE socket pipes with a diameter of 160 mm. Considering the constrained conditions, manholes to be arranged on the sewers will be used as house connections. The sewers are designed in such a way that the pipes will be laid on one side of a street, so that installation of additional manholes for individual properties will be partially avoided. Households located on the opposite side of the street shall be provided with a manhole located at least 3 metres from the property and a 160 mm pipeline from the house manhole to the nearest street sewer manhole, the direction of house connection may not be less than 90 degrees.

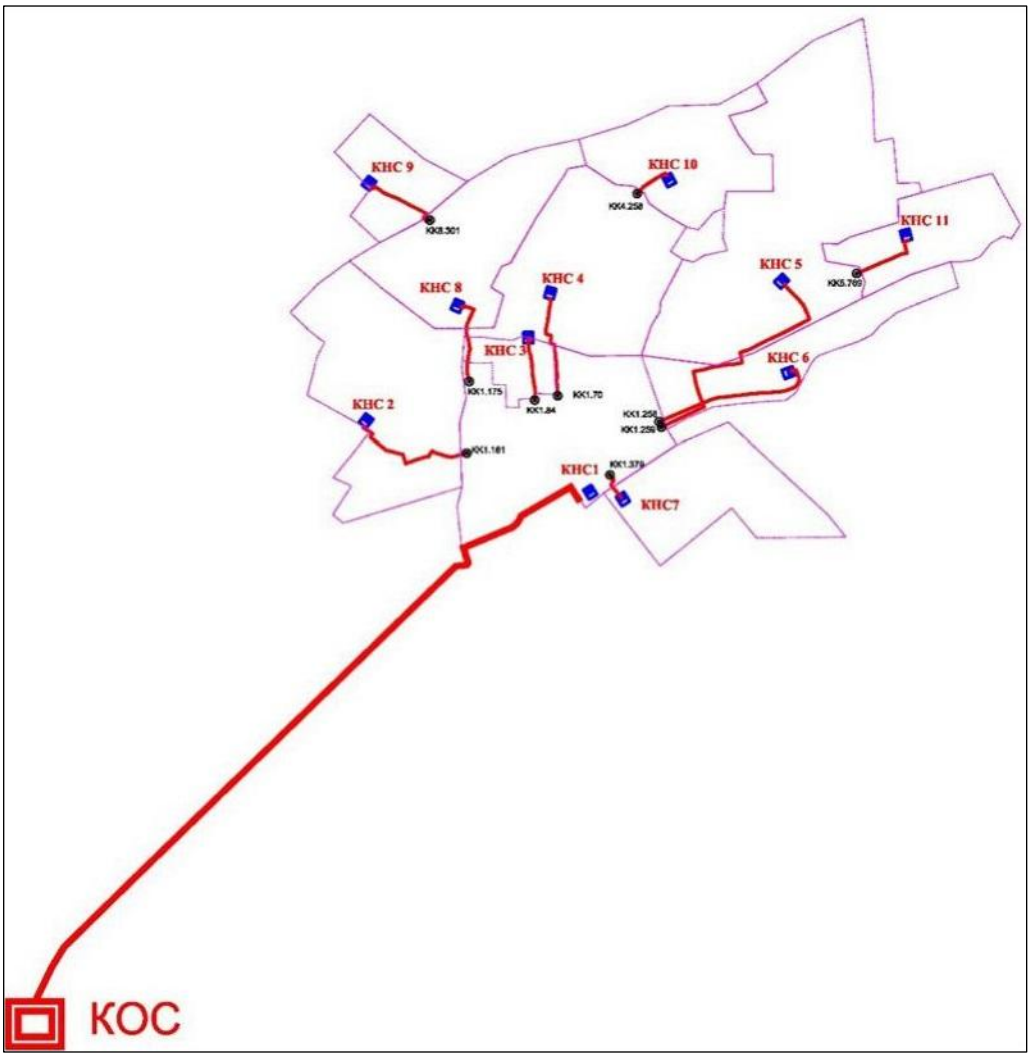


Figure 4.1. Layout of Ramitan Sewer Zones and Pressure Pipe

4.3 Pumping Stations Requirements

4.3.1 Sewer Pumping Station

A SPS includes a storage and collection chamber that lifts and distributes wastewater or sewage when it cannot naturally be carried by gravity. According to the design, there are 11 pumping stations for the purposes of collection of sewage from households' connections to the pipe networks in areas where the minimum gravity fed gradients (therefore pressure) cannot be effectively achieved (see Table 4.2 for SPS details).

The Contractor shall respect the defined Sanitary Protection Zone (SPZ) during any construction work. The preliminary selected sites that have been approved, have considered land acquisition and resettlement; environmental, health and safety issues; and compliance with the SPZ legal standards of Uzbekistan. However, it should be noted that, while there are SPZs, the sites may still be occupied due to low enforcement or updates / changes in SPZs.

The SPS itself shall have dimensions of 10 m x 10 m each. Adding the required legal standard SPZ, the SPS should be an area of 15 m x 15m. The sites shall have paladin fencing with PE powder coating of green colour. SPSs are designed to be underground with internal insulation, reinforced with a plastic wall to a depth down to 8.5 m, diameter 2.0 - 2.5 m. Other elements of the SPSs are a section of access roads, building structures for the SPS and shed, a valve chamber and a water meter chamber.

The Contractor shall equip each SPS with 1 operating + 1 backup pumps, and the main SPS with 2 operating and 1 backup pump station. The pumps shall have soft starters (for pumps with a motor power of more than 15 kW), a self-cleaning impeller with a cutting mechanism and characteristics specified in the drawings. Each SPS shall be equipped with a trash basket, an auxiliary screen to collect debris while cleaning the basket, a knife gate valve, and check valves on the pressure pipeline. All equipment, fittings, guides, fasteners and pipes shall be made of stainless steel. The pump is to be mounted permanently; for this, automatic couplings with mating flanges with guide cams for accurate positioning and an upper tubular bracket for attaching the tubular guide shall be purchased and installed.

Installation and dismantling of pumps, cleaning of the trash basket requires a jib crane on a free-standing column. The jib crane angle of rotation is 360 degrees, with a minimum 2 m lifting height from the top level of SPS to the hook of the lifting device.

Supply and exhaust ventilation with stainless steel air ducts is to be provided. Ventilation system shall be located in the underground part of SPS, at the level of the supply pipeline. A carbon filter is to be installed on the outer part of the exhaust air duct; an explosion-proof fan with an insect screen is to be installed on the supply air duct. Methane and hydrogen sulphide detectors shall be installed inside the ventilation pipe in the SPS envelope.

The design provides for external power supply by a power line on concrete poles to be constructed from the connection point in accordance with technical specifications agreed not earlier than 2 years before installation. It is also planned to install a pole-type transformer at the SPS site, as well as internal power supply and lighting systems.

The Contractor shall install a metal shed over the pumping station, with one wall made of sandwich panels. The electrical and lifting equipment, a diesel generator and automation cabinets shall be installed under the shed. Cables shall be laid underground in stainless steel pipes.

Automation of pump operation is planned, including the possibility of remote control via the SCADA system. Also, SPSs shall have a cabinet for local control, monitoring of wastewater flow, pressure and other parameters of the pumps.

Table 4.2 Specifications of SPS

N	SPS	Capacity		Head	SPS depth,	Internal diameter,	Number of pumps +	Motor capacity, kW
		m^3/h	l/s	m	m	mm	redundancy	
1	SPS1	173.5	48.19	40.2	7.3	3000	2 operating + 1 standby	37
2	SPS2	47.1	13.08	18	7.5	2500	1 operating + 1 standby	4.5
3	SPS3	19.8	5.5	15.7	5.1	2500	1 operating + 1 standby	5.9
4	SPS4	87.8	24.39	17.8	8.2	3000	1 operating + 1 standby	9
5	SPS5	102.1	28.36	26	8.4	3000	1 operating + 1 standby	15
6	SPS6	19.8	5.5	23.6	6.9	2500	1 operating + 1 standby	7.4
7	SPS7	19.8	5.5	15.6	5.9	2500	1 operating + 1 standby	7.5
8	SPS8	40.5	11.25	24.5	7.8	2500	1 operating + 1 standby	7.4
9	SPS9	19.8	5.5	19.8	6.6	2500	1 operating + 1 standby	7.4
10	SPS10	40.8	11.33	13.8	7.7	2500	1 operating + 1 standby	7.4
11	SPS11	19.8	5.5	15.3	6.8	2500	1 operating + 1 standby	5.9

4.3.2 Environmental, Health and Safety Issues

The SPZ for SPS is 15-20 m. SPZs shall be provided around sewerage infrastructure to mitigate any potential negative impacts on local communities, such as residential areas. The required size of an SPZ is determined in accordance with KMK 2.04.03-2019 (Table 4.3), which requires that the SPS be a minimum of 15 metres from other structures. For SPSs with a design capacity of up to 0.2 thousand m^3/day, the size of the SPZ is 15 m, for SPS capacity over 0.2 to 5 thousand m^3/day, the size of SPZ is 20 m (see Table 4.3).

Table 4.3 Sanitary protection zones for SPSs

Description	Capacity, l/s	Capacity, m^3/day	Protective sanitary zone, m (radius)
SPS1	48.19	5045.1	20
SPS2	13.08	684.8	20
SPS3	5.5	125.2	15
SPS4	24.39	1276.4	20
SPS5	28.36	1485.6	20
SPS6	5.5	267.9	20
SPS7	5.5	136.9	15
SPS8	11.25	589.3	20

Description	Capacity, l/s	Capacity, m^3/day	Protective sanitary zone, m (radius)
SPS9	5.5	183.3	15
SPS10	11.33	594.1	20
SPS11	5.5	142.9	15

The SPZ designated for the SPS shall be such that the installed equipment shall also be positioned to avoid noise levels reaching over 45 dBA at night and 55 dBA, at the closest residence, in accordance with World Bank/IFC EHS and Uzbekistan legal noise and vibration standards; and Maximum transient (intermittent only) noise levels in operation, shall reach a maximum 90 dBA. Furthermore, it is understood that there are two pumps in each SPS as a redundancy measure. This is important to ensure environmental, health and safety standards are not compromised. However, even with redundancy measures, there is no guarantee. Therefore, the operators of the sewage system at the time of the first SPS commissioning shall ensure impact risks are covered under an Emergency Response Plan (ERP).

4.4 The Wastewater Treatment Plant

4.4.1 Design Features of the WWTP

This section describes the proposed WWTP Technical Features that are used in assessing the Environmental and Social Risks and Benefits in Ramitan. Wastewater collected from the territory of Ramitan d.c. will be transferred to the new WWTP, which will be built south-west of Ramitan d.c., (site coordinates: North West Corner: 39°53'28.98"N 64°20'11.11"E; North West Corner: 39°53'25.27"N 64°20'19.12"E; South West Corner: 39°53'22.10"N 64°20'5.36"E; South East Corner: 39°53'19.13"N 64°20'11.27"E) on the existing ground. The Central Bukhara Collector (Zarafshon river) is located to the east of the proposed WWTP site. Location scheme of the wastewater treatment plant is provided in Figure 4.2. below.

The Ramitan WWTP shall be delivered as a design-build Contract to deliver a 5,045 m^3/day capacity wastewater treatment plant and all associated works. As part of this project, the Consultant prepared a concept design together with design-build specifications to treat municipal wastewater from a projected population of 28,000 people in design year 2045.

The concept design and design-build specifications have been prepared in accordance with all applicable Uzbekistan KMK and ShNK Standards and EN 12255 (Parts 1-16 Wastewater Treatment Plants) where applicable. Where the local standards do not address the relevant design guidelines, these elements have been designed in accordance with the Wastewater Engineering: Treatment and Reuse (Metcalf & Eddy) technical handbook. This is a widely-used and internationally accepted design handbook for the design of wastewater treatment facilities.

The design-build specifications provide the minimum design requirements and also outline the performance standards to which the WWTP is required adhere to in conjunction with the requirements of the specifications.



Figure 4.2. Ramitan WWTP location

4.4.1.1 Design Requirements

The WWTP is designed based on average values and incorporating process flexibility to ensure that the WWTP can effectively manage varying levels of wastewater volume whilst consistently meeting the performance standards, even under varying operational conditions. The design of the Works has been undertaken based on minimum and maximum wastewater temperatures of 12°C and 25°C respectively.

In general, the design of the WWTP is such that it is designed to meet the below standards as well as requiring minimal consumption of energy, chemicals and other consumables

- The treated effluent from the WWTP shall comply with the effluent quality standards established by the Local Environmental Agency for fishery limits.
- The composted sludge product shall adhere to the regulatory requirements for sewage sludge as per Section 4 [Requirements for Sewage Sludge used for Fertilizer] of SanPiN RUz No. 0181-05 [Hygienic requirements for the quality of wastewater and its sediments used for irrigation and fertilization in the natural and climatic conditions of Uzbekistan].

The main features of the WWTP are discussed in the below sections.

4.4.1.2 Preliminary Treatment Units

Coarse and fine screening equipment for the removal of large solids, greater than 6mm, from the inflow. Once removed, screenings are washed and compacted and deposited in enclosed waste skips for removal to landfill.

Fats, oils and grease (FOG) and grit removal equipment. Removed grit is washed and deposited in enclosed waste skips for removal to landfill. FOG's are deposited in enclosed waste skips for removal to landfill.

All wash water and water collected from the process area of the PTU's is collected separately and transferred the drainage pump station or supernatant pumping station, returning flows to the Biological Treatment Units.

An emergency bypass is provided after the screenings and grit and grease removal equipment where under emergency situations (such as toxic inflow) the inflow to the works can manually be diverted by means of valves and/or penstocks to the sludge drying beds via a gravity pipeline to prevent contamination downstream.

4.4.1.3 Biological Treatment Units

Biological treatment is provided by means of a CAS treatment process, incorporating both biological and chemical phosphorus removal techniques to ensure compliance with the regulatory requirements. CAS is a robust treatment process, comprising of a reactor basin in which micro-organisms are suspended in the sewage, oxygen is introduced by mechanical means and bio-chemical reactions take place by which organic pollutants are removed from the sewage. The suspended activated sludge is separated from the effluent in a clarifier and is returned to the reactor. The mass of sludge continually grows and has to be wasted from the system from time to time to maintain the correct balance.

Chemical dosing for phosphorus removal is provided as backup to ensure the treated effluent always meets the discharge consent.

Powdered activated carbon (PAC) will be dosed into each anaerobic zone of the BTU to support the removal of soluble organic compounds and to meet the discharge standards.

The treated effluent from the BTU's is treated further and disinfected in the Tertiary Treatment Units in order to comply with the strict Fishery Effluent Limits.

The sludge wasted during the activated sludge process is treated further to produce sludge that meets the regulatory requirements for sewage sludge as per Section 4 [Requirements for Sewage Sludge

used for Fertilizer] of SanPiN RUz No. 0181-05 [Hygienic requirements for the quality of wastewater and its sediments used for irrigation and fertilization in the natural and climatic conditions of Uzbekistan].

All chemical dosing facilities are provided with bunds for collection of spills to prevent contamination downstream.

4.4.1.4 Tertiary Treatment

- Micro-disc filtration for removal of suspended solids to meet stringent Fishery Standards.
- Sodium hypochlorite dosing and contact tanks for disinfection of treated effluent before it is discharged to comply with the requirements for Unrestricted Irrigation as stipulated by the World Health Organization (WHO) Guidelines for the Safe Use of Wastewater, Excreta and Greywater – Volume 1 – Policy and Regulatory Aspects (WHO, 2006)
- All chemical dosing facilities are provided with bunds for collection of spills to prevent contamination downstream.

4.4.1.5 Sludge Treatment and Handling

The sludge wasted during the activated sludge process is treated further to produce sludge that meets the regulatory requirements for sewage sludge as per Section 4 [Requirements for Sewage Sludge used for Fertilizer] of SanPiN RUz No. 0181-05 [Hygienic requirements for the quality of wastewater and its sediments used for irrigation and fertilization in the natural and climatic conditions of Uzbekistan].

This is achieved by the following processes:

- Sludge thickening by means of thickeners
- Sludge stabilisation by means of anaerobic digestion
- Mechanical Sludge dewatering. Supernatant/liquors from the sludge thickeners and dewatering units are diverted to the sump of the supernatant pump station, returning flows to the Biological Treatment Units.
- Digested and dewatered sludge is composted in order to achieve pathogen removal
- Sludge drying beds are provided as an emergency back-up method for dewatering sludge when the mechanical processes are unavailable or inoperable. The sludge dying beds are designed to handle 20% of the total dewatering capacity in contingency scenarios, ensuring operational continuity during maintenance or unexpected downtime of mechanical dewatering equipment.

Furthermore, a network of collection channels, gutters, and drains will be installed within the sludge dewatering building and composting area to capture supernatant, filtrate, leachate and surface water runoff. A dedicated pipeline system shall be installed to transfer collected supernatant, filtrate, leachate and surface water runoff to the supernatant sump and pump station, returning flows to the Biological Treatment Units.

4.4.1.6 Additional Details

Odour and Noise

Odour control is provided at the WWTP through air extraction and covers. Odour removal efficiencies are included in the Schedule of Performance Standards.

The WWTP is required to ensure that the maximum noise level 20m from the Site boundary of the wastewater treatment plant does not exceed the Noise Standard limit specified in the Schedule of Performance Standards when all equipment installed is being operated.

Surface Water Run-Off

Surface water run-off from the WWTP is appropriately treated prior to discharge. Appropriate treatment includes petrol interceptors and silt removal if there is a risk of pollution from fuel spillages or silt discharges, respectively.

Treated surface water runoff is required to meet the regulatory requirements for discharge quality, including limits on oil and grease content, turbidity, and other pollutants.

Surface water collected from the sludge composting area will be collected in a separate system to the remainder of the WWTP site, and together with the leachate from the sludge composting process shall be returned to the Biological Treatment Units.

Back-ups and Redundancies

The WWTP is hydraulically designed to handle peak flows and to incorporate additional flows when one process stream is out of operation. In addition, the CAS process is a robust process that has the ability to deal with varying organic and hydraulic loads.

To ensure uninterrupted operation, all key mechanical equipment will incorporate a standby unit.

The WWTP is designed with a generator that is sized to power the main process equipment when required. The generator is designed with fuel storage that is sufficient to power the generator for 1 day.

Treated Wastewater Discharge

Treated wastewater shall be discharged into the Central Bukhara collector (Zarafshon river) at location at 39°53'17.99"N; 64°20'14.75", which is located to the south of the WWTP site (see Figure 4.2). After the construction of the WWTP, the Emissions Limit Value (ELV) of wastewater will correspond to the ELV for fishponds which will be established at the stage directly prior to the WWTP Commissioning, when the Final Environmental Assessment (in Uzbek acronym: the ZEP) is submitted, with the “Positive Conclusion of the State Ecological Expertise” to the ZEP is handed down.

The State Ecological Expertise, in their “positive conclusion to the Draft EIS” issued in October 2023, requires that treated wastewater into the collector be designed in accordance with water quality of Fishpond Standard. In accordance with the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 14 dated 21.01.2014 “On approval of the regulations on the procedure for the development and approval of draft environmental standards”, after the construction of the WWTP, the ELV will not be lower than the ELV of fishery purpose and not higher than the ELV of ambient value (ELV background> ELV > ELV of fishery purpose). The current standards for the maximum concentration of pollutants in the canal surface waters, according to national requirements, are presented in Section 5.5 below.

4.5 Civil works

This ESIA has focused on the required construction engineering requirements for the main 3 parts of the Project, that is, the WWTP, SPSs, and pipeline network.

The project will include the following civil works:

- Earth works (mechanical excavation, auxiliary manual excavation, manual and mechanical backfilling, etc.);
- Laying PE pipes of various sizes;
- Casting concrete and installation of precast RC elements;
- Waterproofing of structural elements;
- Installation of hydro-mechanical equipment (pumps) and shut-off and control valves (gate valves, check valves, etc.);
- Installation of power (transformer substations) and electro-mechanical equipment (control cabinets, etc.);
- Landscaping in the project sites.

All of the above works must be performed in compliance with technical regulations of the Republic of Uzbekistan, Project ESMPF and technical specifications developed by the Consultant.

The following should be noted and taken into account during the civil works:

- In accordance with Uzbekistan standards, the minimum thickness of soil cover shall be 0.70 m above the pipeline without traffic load.
- In dense cohesive soils, trenches with vertical walls may be excavated using rotary and trench excavators without fastening to a depth of no more than 3 m, and people access to such trenches is forbidden.
- Trench sections where presence of people is needed must be fastened or excavated to provide slopes.
- For pits and trenches deeper than 3 m, fastenings shall be tailor made according to design justified by calculation of enclosing and fastening elements.
- Backfilling and compaction shall be carried out immediately after installation of foundations and laying pipelines in trenches; soil to be used for the purpose shall have optimal moisture content, equal to the plastic limit moisture. Soil with excessive or insufficient moisture content may not be used for backfilling. The optimal soil moisture shall be determined by a specialized laboratory.
- Base soils shall be protected from seeping surface water and from freezing during construction. Before the start of excavation work, surface water drainage shall be arranged using temporary drainage ditches and pits, in accordance with the work Method Statement (mS) (by a contractor under a separate agreement). Wetting of base soil shall be prevented during the construction process.
- Excavation work in areas with existing buildings shall be carried out in compliance with safety regulations and under supervision of persons responsible for operation of nearby existing buildings, structures and underground utilities.
- Before any excavation is started, a Method Statement shall be prepared to address the following:
    - Sequence of pit excavation;
    - Details of pit access ramp;
    - Machines to be used for soil excavation and compaction of pit bottom;
    - Soil storage areas for backfilling;
    - Arrangements for the laboratory control over the quality of soil compaction.
- Soils with natural moisture content (except of sandy soils) shall be fixed with boards of a minimum thickness of 40 mm; in moist soils, fixing boards shall be at least 50 mm thick. The boards shall be placed behind vertical posts directly against the soil, and reinforced with struts;
- Excavations in water-saturated soils (running soils) shall be carried out according to individual designs, using safe working methods — dewatering, sheet piling, etc.
- Stripping 300 mm layer of topsoil;
- Arrangement of a 300 mm thick bedding of gravel-sand mixture (GSM);
- Layer-by-layer compaction (maximum thickness of layer - 250 mm) of the soil bedding using manual mechanical rammers (vibrating rollers or plate compactors) to achieve soil density in the lower part of the compacted zone ρ_{dry} = 1.65 t/m³;

- Backfilling to the design level with local soil from EGE-2, EGE-3 with the optimal moisture content, and layer-by-layer compaction (maximum thickness of layer - 200 mm) using manual mechanical rammers (vibrating rollers or plate compactors) to achieve soil density in the lower part of the compacted zone ρ_{dry} = 1.65 t/m³;
- Before any further works, excavated pits shall be inspected by a geological engineer from the organization that carried out the survey, with participation of a representative of the designer. All excavation and piling works shall be carried out in compliance with KMK 3.02.01-97 and design documentation. Edges of the pit shall be fenced. During the work and until backfilling is completed, any storage or installation of equipment closer than 2.0 m to the pit edge is not allowed;
- Reinforcing mesh is made using annealed steel tying wire d=0.8-1.0 mm at intersections of rods.
- Internal walls of SPS shall be lined with V-LOCK polymer tie plates.
- All metal structures shall be made of stainless steel.
- External waterproofing of SPS foundation and walls shall consist of 2 layers of rolled sheet bitumen-polymer material TECHNONICOL or similar certified material. At the concrete joints, additional waterproofing strips 40 cm wide shall be glued in 2 layers.
- Grounding of TS shall be provided using steel L-bar electrodes 63x63x5mm, 2.5 m in length, driven into the ground and interconnected by a steel strip 40x4 mm.
- Electrical installation work shall be carried out in accordance with KMK 3.05.06-97 and Electrical Installation Code (EIC). The low-voltage network voltage is 0.4 kV[6].
- The cables are laid underground in a trench 0.7 m below the graded surface; AC pipes shall be used at utility crossings.
- Cables shall be protected from mechanical damage by brickwork along the entire length of the route.
- Representatives of local power authority shall be invited before installation of the power supply network is commenced.

4.5.1 Indicative Construction Schedule and Working Hours

An indicative construction schedule is provided below.

- Appointment of WWTP contractor in Q2 2025.
    - Six months for detailed design.
    - 15 months for construction.
- Appointment of Sewage Network contractor in Q3 2025
    - Detailed design shall be completed by NOD so no additional design period required for the appointed contractor.
    - 30 months for construction.

The Contractor shall comply with the general limitations on working hours and periods for construction works, as shown in Table 4.4. Where the Contractor wishes to undertake works outside of the normal working week (including Sundays and any overtime), they shall first request and have obtained consent from the client's appointed Engineer (supervisor) at least seven days in advance and shall give notice

[6] Note that separate studies and Government authorities' approvals for power supply to WWTP and SPSs are ongoing.

of four days before undertaking any overtime work that would normally be supervised by the Client's appointed supervisor Engineer.

Table 4.4 Working Time Restrictions

Period / Event	Work Areas Affected	Restrictions and Conditions
Monday to Friday	All areas	No heavy construction plant to be operated outside the hours of 08:00 to 18:00 without prior written approval of the Engineer
Saturdays	All areas	No construction plant to be operated outside the hours of 08:00 to 13:00 without prior written approval of the Engineer
Sundays & Republic of Uzbekistan Public and Festive Holidays	All areas	No work shall be permitted without prior written approval of the Engineer
Daylight	All areas	No work outside normal daylight hours shall be allowed except with prior written Consent of the Engineer.
Night Works (20:00 to 06:00)	All areas	Night working is not to take place without prior approval by the Engineer, unless otherwise specifically stated in the Contract. In any event, night works are restricted to the hours of 20:00 to 05:00 and all excavations are to be backfilled, reinstated and the road fully cleared by 05:00 each morning unless stated otherwise in this Contract.

4.6 Utilities

Any relocation of utilities may require small amounts of land acquisition or temporary land use, also creating an easement. In some many cases of utility relocation, there will be a requirement for the utility authority to either conduct the relocation themselves or subcontract relocation works to licensed contractors. In these cases, a price or time schedule is not necessarily provided prior to the commencement of relocation work, although the executing agency will be required to pay for the services either directly or via the construction contractor. Furthermore, the project construction supervision consultant shall be required to supervise the civil works conducted by the utility contractors to ensure all works comply with the Project standards.

There are special GOST/KMK requirements in relation to technical issues, location, crossing over and other activity around various utilities. Some are as follows:

a) ***Water supply*** - Sections of the water supply pipelines that are located below or non-compliant with the minimum legal horizontal distance of the designed sewers will be re-laid as part of this project. The design provides for 3 meters of PE pipe in accordance with GOST 18599-2001 with the same diameter as the original pipe, including fittings for connection to the existing steel or polyethylene pipes.

Horizontal distance between underground sewerage and water pipelines is 1.5 m. Vertical distance at the crossing of water and sewerage pipelines shall be 0.4 m.

b) ***Storm water*** - The project area has an existing drainage system for collection of storm water. Disposal of storm water in the domestic sewerage system will not be provided.

c) ***Power lines*** - The existing power lines are mostly installed above ground on power poles. The designed sewerage system is routed taking into account the existing poles, with respect for the following distances:

- at least 1 m to foundation of poles for power lines up to 1 kV
- 2 m for power lines from 1 to 35 kV,
- 3 m for power lines over 35kV
- Transmission lines of 100kV or more requires at least a 10-12 metre clearance from ground level and cross utilities, especially gas and water pipes at 90-degree angle (note there are transmission lines on 2 sides, but outside the footprint, of the WWTP site.

d) ***Communication lines*** - Horizontal distance of 0.5 m between the sewer line and communication cables is adopted. Vertical distance is 0.5 m.

e) ***Gas pipelines*** - The adopted horizontal distance to the sewer line is 1 m for low-pressure gas pipelines and 1.5 m for medium-pressure pipelines.

4.7 Requirements for Contractors for House Connections

The Contractor shall provide 34,254 meters of house connections using 160 mm structured wall socket pipes of PE.

A manhole shall be allocated for each house connection. However, any manhole in the network located nearby shall be used for reception of wastewater from households, without installing an additional manhole for the purpose. House connection manholes are to be located on municipal territory near the border of the territory occupied by the connected customer. All connection manholes are designed so that there will be access to each manhole for maintenance and cleaning, when required.

For customer connections to the street networks, the Contractor shall construct house connection manholes with a diameter of 700 mm and connecting pipelines with a diameter of 160 mm.

Before the commencement of construction work, the location of the house connection manholes and pipelines shall be agreed upon at the preparatory stage by mutual agreement between the Consumer (Household) and UzSuvta'minot (Branch of Bukhoro Suv Ta'minoti JSC in the district centre).

The contractor is responsible for installing house connection manholes and customer connections as instructed by the Engineer, after receiving the agreed list of customers from UzSuvta'minot.

The number of house connections (Table 4.5) in the Bill of Quantities is preliminary and subject to change depending on local conditions, but all connections must comply with the Specification.

Customer connections shown in the detailed design indicate the approximate location of house connection manholes, which will be updated considering the agreements between the Ramitan branch of Bukhoro Suv Ta'minoti JSC and owners of the households to be connected to the sewerage network.

Table 4.5 Approximate number of household connections

No.	Zone of sewerage system	Diameter, mm	Number of connections	
			Length, m	Number of house connection wells, pcs
1	Zone of SPS1	160	4511	291
2	Zone of SPS2	160	4228	438
3	Zone of SPS3	160	1105	123
4	Zone of SPS4	160	4818	536
5	Zone of SPS5	160	7982	911
6	Zone of SPS6	160	1282	115
7	Zone of SPS7	160	555	57
8	Zone of SPS8	160	3664	319
9	Zone of SPS9	160	1335	68
10	Zone of SPS10	160	3844	390
11	Zone of SPS11	160	930	88
	TOTAL		**34254**	**3336**

4.8 Other Considerations

There are some other aspects of the project in which Environmental and Social issues may be identified and will need to be mitigated. The following are some of the identified issues.

a) **Compliance with the "Positive Conclusion of the State Ecological Expertise Centre":** In accordance with the environmental legal framework of Uzbekistan, it is required that the Ramitan Sanitation Project comply with "The Positive Conclusion of the State Ecological Expertise Centre" (in Bukhara Region) was obtained in October 2023 (refer to *Annex 2*). This compliance especially includes ensuring the performance standards of procured technical equipment to be installed complies with the state agency' nominated legal ecological standards; any additional instruction provided during the construction period by District Environmental Department Officers; and standards developed for Final EIS (Statement of Ecological Consequences, which in Uzbek language acronym is a ZEP).

b) **Compliance with the Conclusion of Cultural Heritage Agency**: The Agency stipulates that an "Archaeological Supervision Report" to be prepared prior to implementation of construction is submitted and approved.

c) **Workers temporary buildings and structures: Camps, Workshops and Offices:** The range of required skilled and unskilled workers normally is decided by the construction contractor, based on construction schedule and budget factors. During the construction period, there will be several construction contracts awarded - one for each zone, as a minimum, is expected for piping network and the 11 SPSs. For each pipe network contract, approximately 35 to 50 workers, at one time, is anticipated. A smaller number of workers is anticipated for the WWTP at approximately 25-40 workers at one time.

   The Project encourages the recruitment of locally based, or Bukhara city-based, male and female workers, to the maximum extent possible. Clause 1.6 of Gender Action Plan (GAP) stipulates that the Contractor shall implement a policy that actively prevents discrimination against women, protect community health, and enhances economic empowerment of women, in particular female heads of vulnerable households. That is, the recruitment of women or men, into construction role, without discrimination and based on gender such that women may also be recruited to a position in which a woman has the required qualifications and experience to do the work equal to, or better than, the males of the same standard. The GAP also includes various training and capacity building aspects related to removal of Gender discrimination and encouraging women to the workplace on the Project. The GAP is a Gender and Capacity Building Action Plan (GCBAP) for the Project "Development and Modernization of the Sewerage System in Gizhduvan, Ramitan, Karakul, Karaulbazar and Alat District Centres (1st priority)". The GCBAP has been prepared in accordance with the Environmental and Social Management Planning Framework (ESMPF) for Bukhara Region Water Supply and Sewerage Project (BRWWSP) to make sure that the project has a significant impact on improving the health, life conditions and quality for people in the project area, on women's access to resources, their ability to be economically active, and helps improve their well-being by reducing gender-based inequalities in access to the benefits of sanitation infrastructure. The GCBAP is common for all five district centres covered by the project.

   There may also be a potential requirement for skilled labor to be recruited from other parts of Uzbekistan and internationally. The number of labor and management units that are from other parts of Uzbekistan and internationally, will need to be housed, under specific living conditions and policies in accordance with AIIB, FIDIC contractual and Uzbekistan legal requirements.

   The contractor may need to temporarily rent premises or land for a contractor's camp, offices and workshop areas, which may be in the same, or separate, locations near the Project sites. The sites must be developed to include gender separate sleeping quarters, gender separate toilets and ablutions; and other gender specific requirements that are culturally acceptable to both Uzbekistan

regulation, labor code, regions and nations from which workers travel. If premises hired by the contractor, such as workshops, camps and offices, are in separate locations, then each location shall include gender separate toilets and ablutions etc.

Rehabilitation of these sites, to their original state, will be required. The owner/landlord of the site may request the contractor leave the rented premises in a different status. All premises used by the contractor shall be in accordance with Environmental and social laws and policies of Government of Uzbekistan and AIIB, respectively. This shall all be agreed through the negotiated rental contract, signed prior to the contractor moving to the specific site[7].

d) Stockpile Areas: The Contractor shall need to identify suitable stockpile areas for any reusable materials, waste materials and new materials coming onto the Project site, in accordance with Environmental and social laws and policies of Government of Uzbekistan and AIIB, respectively, and Project ESMP. The contractor will be responsible for the identification and rental of sites, or the Mahalla and Hokimiyat may provide areas for this purpose. Rehabilitation to original state will be required (also refer to point b) above).

e) Quarries and Borrow-pit areas: There may be a need to obtain materials, suitable to engineering specification, sourced from borrow-pits or quarry areas around Bukhara region. In these cases, the Contractor, with employer and supervision consultant shall ensure that the material source is fully licensed in Uzbekistan, supplies a copy of official approvals from environmental authorities and in compliance with social and environmental requirements of AIIB and this Project. Rehabilitation to original state will be required (also refer to point b above).

f) Access Roads: Select suitable haul routes away from sensitive areas such as, but not limited to, ecologically sensitive areas, schools, built-up areas, mosques, heavily populated areas like markets. A transport management plan(s) shall be submitted by each contractor, approved by local road police, Hokimiyat authorities, supervision consultant and employer.

Trucks will cover materials and tailgates shall be closed during transport on outside road routes. Compensation to businesses and land acquisition (temporary) may be necessary depending on the size of trucks and routes used. The contractor will compensate for any damage to roads or property that occurs due to construction transport use under the Project. Rehabilitation to original pre-project state, or better, will be required through mutual agreement with khokimiyat authorities and contractor (agreements and plans to be shared with employer and Supervision Consultant).

At different stages of construction, different amounts and types of equipment will be used. The equipment will work on 3 sites: at the beginning, middle and end of the site. All the equipment will work alternately performing its functions. It is expected that each type of equipment will work periodically, no more than a month, on one site – generally, by Uzbekistan Laws and norms of construction, 500m lengths of road may be closed, with detour in place or partially closed with specific barriers and safe, 2-way traffic outside of working hours. Refuelling and maintenance of equipment will be carried out at the construction contractor's workshop.

g) Contractor use of Power Supply: The local power supply network of the district will be used for the duration of the construction. The existing irrigation network will be used for technical water supply, and the water supply network in settlements will be used for household needs. However, if the case of any power or irrigation water supply is forecasted or does reach a level that the is only sufficient for the local users, the construction contractor will be required to source alternative

[7] It is recommended that the rental of sites for contractor facilities be inspected and rental contract signing in the presence of the Supervision Consultant and the employer to ensure national and international requirements are fulfilled and rehabilitation works at project end may be monitored.

supplies. Any cost or supply impacts of power or water resource use shall not be passed onto the industries and community normal local users.

h) Core Labor Standards: FIDIC-based contracts include a number of mandatory core labor standards to comply, working hours will be 8 hours a day (one shift). The following issues are key core labor considerations:

- As part of Contractor HSE and SSEMPs, the contractor will be required to provide a “Code of Conduct” for adherence by its labor force.
- It is anticipated that up to twenty people will be involved in the construction at each construction
- The equipment for the construction is up to the contractor, in order to complete the construction within the allocated time and in accordance with the contract. However, it is expected that the construction will need cranes, excavators, dump trucks, water cart (in case of dust suppression) and front-end loaders/backhoes on the construction site(s) for the sewer pipeline construction.
- There may additionally be emergency service vehicles, bus, mobile compressor, PVC welding equipment (depending on method of fusing together PVC pipe lengths) and other equipment, as required.

5 POLICY, LEGISLATIVE AND INSTITUTIONAL FRAMEWORK

This section outlines some of the key laws, policies, legal standards, and institutions that are essential to Environmental and Social safeguards protection in this Project. Additionally, information on the most updated safeguards policies of AIIB, identification with Uzbekistan legal framework and a set of principles recommended for project implementation.

The environmental impact of the proposed Project is regulated by a number of environmental legislative acts and standards of the Republic of Uzbekistan (RUz). The legal framework of Uzbekistan consists of three levels, related to this Project. The first is the Constitution of Uzbekistan, from which all laws and Acts are developed. Secondly, laws, acts, and presidential decrees are issued. These are then implemented as legal standards, the third level of the legal framework. This third level is particularly relevant in that they are regularly reviewed and updated based on the relevant laws.

5.1 Constitution of Uzbekistan

The Constitution of Uzbekistan (May 1, 2023, No. LRU-837) has the following provisions relating to environmental and social aspects:

- Article 61: It is the duty of citizens to protect the historical, spiritual and cultural heritage of the people of Uzbekistan. Cultural monuments shall be protected by the state.
- Article 62: All citizens shall protect the environment.
- Article 65: All forms of ownership of citizens are under the State protection.
- Article 66: No property shall inflict harm to the environment.
- Article 68: Land, subsoils, flora, fauna, and other natural resources are protected by the state and considered as resources of national wealth subject to sustainable use.

5.2 Key National Environmental and Social Laws of Uzbekistan

5.2.1 Introduction

The National Draft EIA, in compliance with Uzbekistan law, has been completed and a positive conclusion of the Environmental Expertise has been issued giving Environmental Approval for commencement of the Project. For this reason, the process is described below for information.

The main regulatory body for national EIA in Uzbekistan is the Ministry of Ecology, Environmental protection and Climate Change (MEEPCC) Republic of Uzbekistan. The MEEPCC performs its activities on the basis of the following legal acts and their amendments, which are listed below in chronological order:

- Presidential Decree of April 21, 2017 No. UP-5024 "On improving the system of public administration in the field of ecology and environmental protection";
- Resolution of the President of the Republic of Uzbekistan of April 21, 2017 No. PP-2915 “On measures to ensure the organization of the activities of the State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection”;
- Resolution of the President of the Republic of Uzbekistan dated October 3, 2018 No. PP-3956 “On measures to ensure the organization of the activities of the State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection”;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated January 15, 2019 No. 29 “On Approving the Provision on the State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection”;

- RCM of RUz dated September 7, 2020. No.541 “On measures for the further improvement of environmental impact assessment”; and other laws and by-laws related to nature protection.
- Resolution of the President of the Republic of Uzbekistan, dated December 30, 2021, №-76 "On measures for environmental protection and organization of activities of state bodies in the field of environmental control";
- Presidential Decree No. UP-81 “On measures to transform the field of ecology and environmental protection and organize the activities of the authorized state body”.
- Resolution of the President of the Republic of Uzbekistan (PP-349), of August 11 2022, “About the Additional Measures for organization of works of Sanitary Cleaning and Ensuring Purity in Settlements”.
- Presidential Decree No. PP-436 of December 2 2022 validating the “Program on the transition to a green economy and ensuring green growth in the Republic of Uzbekistan until 2030”.
- Presidential Decree No. PP-171 on May 31, 2023, “On effectively organise the activities of the Ministry of Ecology, Environmental Protection, and Climate Change” in 13 priority areas.
- Presidential Decree No. UP269 “About measures for realization of administrative reform of New Uzbekistan (as amended on 23.08.2024). For the purpose of ensuring execution of the Presidential decree of the Republic of Uzbekistan of August 11, 2022 No. UP-189 "About First-priority Measures for Reforming of System of the Organization of the Address with Waste".
- Decree of the Cabinet of Ministers No. 464 dd. 22.08.22, “Resolution Of The Cabinet Of Ministers Of The Republic Of Uzbekistan On Further Improvement Of The Procedures For Planting, Caring For, And Using Trees And Shrubs Not Included In The State Forest Fund”.

The national EIA procedure is regulated by:

- Law of the Republic of Uzbekistan “On Ecological Expertise” (2000); and
- Regulations "On the State Environmental Expertise", approved by the Resolution of the Cabinet of Ministers No. 541 “On further improvement of the environmental impact assessment mechanism’ (2020).

The 2020 Resolution specifies the legal requirements for EIA in Uzbekistan. According to the Resolution, the State Environmental Expertise Centre (SEEC), formerly the State Ecological Expertise is an environmental examination carried out by specialized expert divisions to set up the compliance of the planned activities with Uzbekistan legal environmental requirements and determination of the permissibility of the environmental examination object implementation.

The Ministry of Ecology, Environmental protection and Climate Change (MEEPCC), formerly known as the Ministry of Ecology, Environmental protection and Climate Change of the Republic of Uzbekistan (MEEPCC), carries out the state environmental examination of the EIA of the objects of economic activity classified as categories I, II or III of environmental impact (high and medium risk);

National EIAs in Uzbekistan consist of three stages to obtain the Environmental Approval:

- Stage I - Preliminary EIA report – initial and mandatory stage.
- Stage II – Statement on Environmental impacts is a non-mandatory stage and can be skipped if the local regulator is satisfied with the assessment provided in the Preliminary EIA report (EIS).

- Stage III – Statement on Environmental Consequences - is the final stage and output that should be prepared and submitted to the regulator after completing construction/reconstruction works and before the commissioning of the project (ZEP).

5.2.2 Law on Nature Protection (1992 and as amended in 2024)

This law is the key national environmental law for the protection of the environment and the sustainable use of resources and the right of the population to a clean healthy environment. This law states the legal, economic, and organizational basis for the conservation of the environment and the rational use of natural resources.

- Article 24: The State Environmental Expertise (SEE) is a mandatory measure for environmental protection, preceded by the decision-making process.
- Article 25: The law prohibits the implementation of any project without approval from SEE.
- Article 53: If an international treaty concluded by the Republic of Uzbekistan establishes rules other than those provided for by the legislation of the Republic of Uzbekistan on nature protection, the rules of the international treaty shall be applied, except in cases where the legislation of the Republic of Uzbekistan establishes stricter requirements.

5.2.3 Law on Environmental Control (2013 and as amended in 2024)

- Article 4: The main objectives of this law include:
    - Prevention, detection and suppression of violation of legislative requirements relating to environmental protection and rational use of natural resources.
    - Monitoring the state of the environment, identifying situations that can lead to environmental pollution, irrational use of natural resources, and pose a threat to the life and health of citizens.
    - Determination of compliance with environmental requirements of any ongoing economic development activities.
    - Ensuring compliance with the rights and legitimate interests of legal entities and individuals performing their duties in relation to environmental protection and sustainable use of natural resources.
- Article 7: The objects of environmental control are:
    - Land, its subsoil, waters, flora and fauna, and atmospheric air;
    - Natural and man-made sources of impact on the environment; and
    - Activities, action or inaction that may lead to pollution of the environment and irrational use of natural resources, create a threat to the life and health of citizens.

5.2.4 Decree of the President of the Republic of Uzbekistan N0 PD-46 "On measures to accelerate works on landscaping and further effective organization of the protection of trees in the Republic of Uzbekistan" dated 30.12.2021

- Paragraph 1: Extend the moratorium on cutting down valuable species of trees and shrubs that are not included in the state forest fund for an indefinite period. *This means there is no deadline for restrictions on decorative tree cutting.*
- Clause 2, Subclause D: It is strictly forbidden to adopt government orders, protocols, written instructions, departmental acts, instructions and decisions of local executive authorities,

including instructions for felling, uprooting, damaging or destruction of valuable species of trees and shrubs that are not included in the state forest fund.

- Clause 6: The State Committee for Ecology is responsible for monitoring, and it should record all permits issued for tree cutting, including pruning for sanitary purposes, in the context of a specific area and each tree.
- Clause 15: The usual procedure of receiving permits for tree cutting is an inventory survey conducted by the Ecology Committee.

5.2.5 Resolution of Cabinet of Ministers No.86 "On approval of single regulation on procedures for issuing certain permits through a special electronic system" dated 01.03.2022

The current legal act allows to issuing permits for various purposes, including collecting species of flora as well as cutting trees, which do not belong to natural parks, forestry funds etc.

In particular, the current Resolution's Annex 14 prescribes cases when species of flora are eligible for collecting (preparation) and (or) extracting from the natural environment plant, apart from these which are included in the Red Book and located on forestry fund land.

The current legislation (Annex 15) allows the following cases of tree cutting:

- Trees and bushes which are not located in the land of the forestry fund.
- Trees and bushes that might interfere operation of equipment and devices during the construction and reconstruction of buildings, structures and communications.
- Trees and bushes that might interfere for the implementation of engineering research.

For cutting trees and bushes, for above mentioned cases, there is a need to obtain a special permission through the Unified Centre for Public Services. It is necessary to submit an application and determine purposes for cutting and number of trees and bushes that are subject to removal.

Cutting of trees and bushes for sanitary purposes from a part of the trunk and (or) from the base (dry and diseased trees) is carried out without the fees stipulated in clauses 6 and 7 of this passport based on the permission of the bodies of the State Ecology Committee. A permit is not required for pruning or trimming branches of trees and shrubs for sanitary purposes.

Permission for cutting trees is not eligible for following types of land:

- Private land (gardens, land plots that belong to physical and legal entities).
- Trees, plants and bushes located in nurseries and plantations.
- Trees and bushes located in forestry fund land.

Resolution specifies following trees and bushes which are not considered as forestry fund:

- Trees and bushes grown in cities and other settlements, as well as those which are planted for landscaping purposes.
- Trees and bushes grown in surrounding of railways and highways, natural and artificial water canals, water basins and other water bodies;
- Trees and bushes grown in surrounding of agricultural fields.

Project developer should submit an application to Unified centre for public services with detailed description of project, number of trees/bushes to be cut due to the project implementation. Application is subject to review during 5 working days, and centre will notify project developer on the results of application review.

5.2.6 Civil Code of the Republic of Uzbekistan (1997, as amended in 2024)

The Civil Code (CC) protects legal Uzbek citizens in relation to ownership of all types of property (material, intellectual etc). The CC determines following provisions the main provisions/general rules for valuation of property, cases of confiscation of property, and rights for compensation:

- Article 14: Cases of violation of right of the citizen of Uzbekistan, all loses should be fully compensated, unless the law or the contract does not provide compensation for losses (Article 14).
- Article 83: Land plots, subsoils, building/structures, perinatal plants are defined as an immovable property (real estate). Immovable property includes objects whose displacement without disproportionate damage to their purpose is impossible.
- Article 84: All real estate property should be legally registered. As a result, all property without registration is not required to be compensated.

5.2.7 Land Code of the Republic of Uzbekistan (1998, as amended in 2024)

The Land Code (LC) covers all land issues, including land acquisition, land allocation, transfer and sales of land plots, and determines types of land ownership.

- Article 16: Land is a national wealth, subject to rational use and protected by the state.
- Article 36, Clause 4: Termination of the right of permanent and temporary land use is made by the decisions of local administration representatives. In case of disagreement, landowners have the right to appeal to the court.
- Article 37: Withdrawal of land plots or their parts belonging to individuals and legal entities for public needs with compensation shall be carried out in the manner prescribed by law.
- Article 37^1, Clause 2: Redemption of a land plot for public needs owned by foreign legal entities and individuals, together with an object of trade and the service sector or residential premises and another building or part of a building, is carried out by local administration representatives.
- Article 39 Clause 7: In case of land acquisition, the landowner, land leaseholder and house owners have the right to be refunded for their losses (including lost profit) or compensation costs for voluntary renunciation of land.
- Article 41, Clause 3: losses caused by violation of the rights of land lease, tenants and landowners (including lost profits), shall be reimbursed in full.
- Article 41, Clause 4: Full compensation of losses including lost profits may be provided to a land user or tenant before acquisition of the land to the State or for public need.
- Article 86, Clause 1: specifies the cases where losses to land users must be compensated in full including loss of profits:
    - Acquisition, redemption or temporary occupation of land.
    - Limitation of their rights due to the establishment of environmental protection zones, cultural heritage objects, roads, pipelines, communication and transmission lines, etc.
    - Worsening of the quality of land as a result of the negative impacts by construction and exploitation of objects exuding harmful substances for agricultural crops and plantations, and other negative actions of legal entities and individuals.
- Article 87, Clause 1: Losses of agricultural and forestry production caused by the acquisition of agricultural and forest land used by individuals for purposes not related to agriculture and forestry, restrictions on the rights of land leaseholders, or deterioration of land caused by

impacts of the activity of enterprises, institutions and organizations shall be additionally compensated to the Land Rights, Acquisition and Resettlement.

The following Laws apart from Land Code and Civil Code are relevant to the Project:

- Law of the Republic of Uzbekistan on State Land Cadastre No.666-I of 28.08.1998;
- Presidential Decree № UP-5495. Decree “On measures on cardinal improvement of investment climate in the republic of Uzbekistan";
- Appendix No. 2 to the Resolution of the Cabinet of Ministers № 146 (2011), regulation “On the Procedure for Compensation for Losses of Land Owners, Users, Tenants and Owners, as well as Losses of Agricultural and Forestry Production”;
- Resolution No. 911 of the Cabinet of Ministers (2019) “On the Procedure for withdrawal of land plots and compensation to owners of immovable property located on the land plot; and
- Law of RUz No. 781 (2022) “On procedures for the withdrawal of land plots for public needs with compensation”.

5.2.8 Right of Way and Land Acquisition in Uzbekistan

- Procedures for the use of right of way (ROW) in Uzbekistan are the same for legal entities and individuals. ROW or limited use of a land plot is determined in the Land Code of Uzbekistan, and Civil Code (under the term servitude), and also in the RCM No.911 dated 16.11.2019. Article 30 of Land Code (LC) determines engineering, electrical power and other lines and constructions as a reason for receiving the right to servitude. In accordance with Article 30 of the Land Code, Article 173 of the Civil Code (CC), and Article 30 of Annex 1 of the Resolution of Cabinet of Ministers No. 1060 dated December 29, 2018, servitude is established by agreement between persons demanding establishment of servitude and the owner, user, lessee, proprietor of the land plot. If they do not achieve consent, the servitude shall be established by court decision at the user's claim. The agreement on servitude shall be subject to state registration and shall be preserved when the land plot is transferred to another person. Servitude agreements can be terminated in cases of the cessation of the reason according to which it was established.
- Article 173 of CC also states that the burdening of a land parcel by servitude does not deprive the owner of the parcel of the rights of possession, use, and disposition of this parcel.
- Calculation and compensation of losses due to servitude agreement are performed in accordance with Law No. 781 (2022) “On procedures for the withdrawal of land plots for public needs with compensation” (if it is a project for public needs) the Resolutions of Cabinet of Ministers No.146 from 25 May 2011 “On measures to improve the procedure for granting land plots for urban development activities and other non-agricultural purposes” and No. 911 from 16 November 2019 “On additional measures for enhancing modalities of providing compensation on withdrawal and allocation of land plots and safeguard the property rights legal and physical entities”.
- Article 86 of the LC states that losses caused to the owners of land parcels, landowners, land users and lessees are liable to be fully refunded (including the lost profit) in the case of limitation of their rights in connection with land acquisition. Refunding of losses is carried out at the expense of the resources of the corresponding Centralized funds for compensation of losses to individuals and legal entities in connection with the seizure of land plots from them for public needs, and by enterprises, establishments and organizations the activity of which causes limitation of rights of land parcel owners, landowners, land users and lessees or worsening the quality of the neighbouring lands in the order established by legislation.

- Article 173 of the CC states that the owner of the parcel burdened with the servitude has the right, unless otherwise provided by a Law, to demand from the person, in whose interests the servitude is established, proportional payment for the use of the parcel.
- Law of the Republic of Uzbekistan on Amendments and Additions to Certain Legislative Acts of the Republic of Uzbekistan in Connection with the Improvement of Land Legislation. Adopted by the Legislative Chamber on July 25, 2023. Regulates the easement agreement, the rights and obligations of the easement participants, the rules for changing the easement and its cancellation, payment for the easement, and the establishment of a public easement.

5.2.9 Labor and Employment

The labor policy in Uzbekistan is applied at the national government level and is reflected in the relevant laws, regulations, and national social programmes.

- Labor Code of the Republic of Uzbekistan 1996 particularly Article 211, or as amended on 18.05.2022; Law of the Republic of Uzbekistan, № ZRU-798 “On Approval of the Labor Code of the Republic of Uzbekistan”, dated October 28, 2022. Especially important, for the Project refers to advancements in ensuring equal pay and removing job restrictions for women is included in the Labor Code adopted in 2022.
- Standard regulations on the organization of work on labor protection Article 273, August 14, 1996 and its updates.
- Law “On the employment of the population” No. 642 of 20.10.2020;
- Resolution of the Ministry of Labor and Social Protection of the Population, Ministry of Health of the Republic of Uzbekistan, registered on 29.07.2009, reg. number 1990 “About the approval of the list of occupations with unfavourable conditions, in which the use of the labor of persons under 18 years of age is prohibited”
- Decree No. 133 of 11 March 1997 to approve normative acts necessary for the realization of the Labor Code of the Republic of Uzbekistan;
- Decree of the Cabinet of the Ministers No. 1011 of 22 December 2017 "On Perfection of the Methodology of Definition of Number of People in Need of Job Placement, including the Methodology for Observing Households with Regard to Employment Issues, also for the Development of Balance of Labor Resources, Employment and Job Placement of Population";
- Decree of the Cabinet of the Ministers No. 965 of 5 December 2017 "On the Measures of Further Perfection of the Procedure of Establishment and Reservation of Minimum Number of Job Places for the Job Placement of Persons who are in need of Social Protection and Face Difficulties in Searching Employment and Incapable of Competing in Labor Market with Equal Conditions"; and
- Decree No. 964 of 5 December 2017 "On the Measures for Perfection of the Activity of Self-Government Bodies Aimed at Ensuring Employment, firstly for the Youth and Women".

5.2.10 Ministry of Social Protection of Labor and Population of the Republic of Uzbekistan Order: Rules of Labor Protection in Construction, Repair and maintenance of roads

The following is applicable to this Project on the basis that most of the pipeline network and machine access will be using roads in the Ramitan district and project location:

- Safety to be used in roads and bridge construction, including access roads, and internal roads in construction sites and related areas, barriers requirements around construction sites and for safety of workers, safety of construction site at night, work at heights and certifications requirements for those working at heights with harnesses.

- Some requirements for public safety, such as barriers and accessways around construction sites.
- Safety of working construction machinery when operating on the site in protection of workers and public.
- Safety requirements for specific machines such as scrapers, bulldozers graders etc.
- Safety of production equipment, including PPE requirements for labor.
- Safety of machinery, including inspections and safety procedures prior to operating a machine and during maintenance works on machines.
- Minimum standard conditions for workshop (outside or inside) areas.

5.2.11 Roads on the Territory of the Republic of Uzbekistan ShNK 2.05.02-07, 2008

The Urban Regulations and Rules: “Roads on the territory of the Republic of Uzbekistan” ShNK 2.05.02-07, 2008. This regulation provides the following:

- Description of the various road categories I-V, and their uses, including information on traffic numbers accepted for each category of road. The roads in the Ramitan Project are mostly Category III, IV or V.
- Road design requirements for safety.
- Safety furniture to be used for specific roads and structures such as bridges and railway crossings, lighting for night, and electric lines standard requirements.
- Requirements for half and full road closures.
- Compensation stipulated before.

5.2.12 Other Relevant Environmental Laws

Apart from above mentioned key legal acts, the following Laws may be relevant to the Project:

- The Law of the Republic of Uzbekistan “On Water and Water Use” (1993), as amended in 2022.
- The Law of the Republic of Uzbekistan “On Ecological Expertise” (2000), as amended in 2021.
- The Law of the Republic of Uzbekistan “On Atmospheric Air Protection” (1997), amended in 2021.
- The Law of the Republic of Uzbekistan “On Protection and Use of Vegetation” (1997), as amended in 2022.
- The Law of the Republic of Uzbekistan "On Protection and Use of the Wildlife" (1997) as amended in 2022.
- The Law of the Republic of Uzbekistan “On Protected Natural Reserves” (2004) as amended in 2022.
- The Law of the Republic of Uzbekistan “On Wastes” (2002) as amended in 2020.
- The Law “On the sanitary and epidemiological well-being of the population” (2015) as amended in 2022.
- Resolution of Cabinet of Ministries of the Republic of Uzbekistan №820 “On measures to further improve the economic mechanisms for ensuring nature” (2018) as amended in 2021.

- The Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No 14. “On approval of the regulation on the procedure for the development and agreement of projects with environmental standards” (2014) as amended in 2018.
- The Resolution of Cabinet of Ministers of the Republic of Uzbekistan No.95 “On approval of general technical regulations of environmental safety” (2020) as amended in 2022.
- Law of the Republic of Uzbekistan on State Land Cadastre No.666-I of 28.08.1998
- Presidential Decree № UP-5495. Decree “On measures on cardinal improvement of investment climate in the republic of Uzbekistan";
- Appendix No. 2 to the Resolution of the Cabinet of Ministers № 146 (2011), regulation “On the Procedure for Compensation for Losses of Land Owners, Users, Tenants and Owners, as well as Losses of Agricultural and Forestry Production”;
- The Resolution No. 911 of the Cabinet of Ministers (2019) “On the Procedure for withdrawal of land plots and compensation to owners of immovable property located on the land plot;
- The Law of the Republic of Uzbekistan No 781 (2022) “On procedures for the withdrawal of land plots for public needs with compensation”.
- The Law of the Republic of Uzbekistan dated August 30, 2001, No. 269-II. “On the Protection and Use of Cultural Heritage Objects” In 2009, changes were made that protect, along with the tangible cultural heritage, the intangible cultural heritage. Last amended in 2022.
- The Law of the Republic of Uzbekistan on Amendments and Additions to Certain Legislative Acts of the Republic of Uzbekistan in Connection with the Improvement of Land Legislation. Adopted by the Legislative Chamber on July 25, 2023. Regulates the easement agreement, the rights and obligations of the easement participants, the rules for changing the easement and its cancellation, payment for the easement, and the establishment of a public easement.
- The Law of Republic of Uzbekistan No. 276 “On Burial” dated 27.12.2010; and RCM No. 101 “On measures to implement the law of the republic of Uzbekistan on Burial and funeral ceremonies.

5.3 Legal Acts of the Republic of Uzbekistan

In a framework of consultations with stakeholders, it was revealed number of other legal acts applicable to the Project. Table 5.1 below describes other applicable legislation that should be followed while carrying out construction works near public infrastructure.

Table 5.1. Other Applicable Legislation

Legal act	Application to the Project
Resolution of Cabinet of Ministries No. 981 “On approval of sanitary protection zones for water bodies in Uzbekistan” dated 12.12.2019	The size of the sanitary protection zone for canals used for household and drinking and medical and recreational purposes, is established taking into account geomorphological, hydrogeological conditions, and the nature of the use of adjacent lands and is taken in the following sizes from the normal water level: a) for canals with a capacity of 50 to 100 cubic meters. meters of water per second - 50 - 70 meters; b) for canals with a capacity of 100 to 150 cubic meters. meters of water per second - 70 - 100 meters; c) for canals with a capacity of more than 150 cubic meters. meters of water per second - 100 - 150 meters.

Legal act	Application to the Project
	The minimum distance to canals used for irrigation and drainage purposes size of sanitary protection should be as follows: a) for irrigation networks with a total depth of 0.75 - 2 meters, serving two or more farms and other agricultural organizations along the normal water level - 5 meters; b) for canals and collector-drainage networks with a total depth of 2 - 5 meters along the normal water level - 6.5 - 9 meters; c) for canals and collector-drainage networks with a total depth of 5 - 10 meters along the normal water level - 9.5 - 12 meters.
Water/wastewater pipelines	
KMK 2.04.02-19	Paragraph 10.12 prescribes: - 30 meters of buffer zones for well-protected sources of ground water (boreholes, wells etc); and - 50 meters of buffer zones for poorly protected sources of ground water (boreholes, wells) Paragraph 10.20 prescribes 20 meters of buffer zone from both sides of main water pipelines with a diameter of 1000mm
Telecommunication	
The Law of the Republic of Uzbekistan "On Telecommunications"	Article 16 – affected assets that belong to communication (cables, optic fibre cables) are subject to compensation at the cost of the Project developer, including the costs for relocation of assets, if needed.
RCM No. 210 "On approval of rules for the safety of telecommunication lines" dated 15.05.1998	Article 10 specifies buffer zones for different types of communication lines: - for overhead and ground cables – 2 metres from each side; - when crossing rivers, lakes, reservoirs, and canals - 100 meters on each side, and for marine cable lines - 0.25 miles; - for ground and underground cables unattended amplifying and regeneration points on communication lines - 3 meters.
Gas pipelines	
SHNK 2.04.08-13	Requirements indicated in paragraphs 4.56 – 4.60 should be followed during the construction and operation of gas pipelines along the railways and automobile roads. There are requirements for relocation/construction of new pipelines.

5.4 National Norms and Standards

Local legislation prescribes a number of requirements for roads. Given that the sewage pipe network will be placed with road alignments, in most cases, and within the territory of other public utilities, several standards may or may not need to be complied with in construction and operation. The following are the Uzbekistan legal standards and norms that must be complied.

SanPiN 0339-16 "On sanitary rules and norms for planning and construction works of living settlements" - prescribes specific requirements for reconstruction/reconstruction work of roads, highways, and railways.

ShNK[8] 2.05.02 – 07 "Roads". Provides legal requirements for:

- Environmental protection measures, choice of solutions for road intersections and junctions, pavement design, furnishings, engineering devices (including fences, bicycle paths, lighting and communications), building composition and structures of the road and motor transport service

[8] ShNK is term that determines as Rules/Standards for architectural construction.

in order to reduce one-time costs should be taken into account the staging of their construction and the increase in traffic intensity.

- Ensure minimal disruption of the existing ecological, geological, hydrological and other natural conditions. It is also necessary to take into account valuable agricultural lands, cemeteries, mosques, and other religious buildings and structures, as well as recreation areas, protected areas, and resorts; procedures (discharge of water, noise levels, restoration of topsoil after completion of construction) that should be considered while implementing projects that include roads.
- The vertical distance from the wires of overhead telephone and telegraph lines to the carriageway at the intersections of highways must be at least 5.5 m (in the warm season). The elevation of wires at the intersection with power lines should be not less than:
    - 6.0 m - at voltage up to 1 kV;
    - 7.0 m - at voltage up to 110 kV;
    - 7.5 m - at voltage up to 150 kV;
    - 8.0 m - at voltage up to 220 kV;
    - 8.5 m - at voltage up to 330 kV;
    - 9.0 m - at voltage up to 500 kV;
    - 16.0 m - at voltage up to 750 kV.

5.5 Applicable National Environmental Standards

Uzbekistan has a large set of specific standards that refer to emissions, effluent discharge, and noise standards, as well as standards to handle and dispose of specific wastes ranging from sewage to hazardous wastes. The following summarizes these laws and standards along with other international best practice standards that will be applied to the Project.

5.5.1 Air Quality

National Standards: Air quality in Uzbekistan is measured against Maximum Permissible Concentrations (MPC) and Maximum Permissible Emissions (MPE).

Ambient Air Quality Standards, or MPCs, are established by SanPiN 0293-11 (May 16, 2011). According to the United Nations Environment Program (UNEP), Uzbek national ambient air quality standards meet World Health Organization (WHO) standards.[9] The MPCs relevant to the Project are shown in Table 5.2.

Table 5.2. National Air Quality MPCs

Pollutant	Uzbekistan MPC (mg/m^3)			
	30 min	24 Hour	Monthly	Annually
Nitrogen Dioxide (NO_2)	0.085	0.06	0.05	0.05
Nitrogen Oxide (NO)	0.6	0.25	0.12	0.06
Sulphur Dioxide (SO_2)	0.5	0.2	0.1	0.05
Dust	0.15	0.1	0.08	0.05

[9] https://wedocs.unep.org/bitstream/handle/20.500.11822/17141/Uzbekistan.pdf?sequence=1&isAllowed=y

Carbon Monoxide (CO)	5.0	4.0	3.5	3.0

Emission standards are stipulated by the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 14 of January 21, 2014 "On Approval of the Regulation on the Procedure for Developing and Coordinating Environmental Draft Projects". It states that the main criterion for establishing MPE is quotas for pollutants. The pollutant air quality quotas differ between main cities and regions nationwide. Air quality standards will only be of key concern during construction and in terms of climate change-related emissions, which may be released during sewage treatment in the form of ammonia gases and carbon compounds

WBG and EU Standards: The World Bank Group (WBG) have established ambient air quality standards based on World Health Organization (WHO) guidelines, and the EU has also established air quality guidelines. The following Table 5.3 and Table 5.4 illustrates the guidelines.

Table 5.3. EU Ambient Air Quality Guidelines

Pollutant	Averaging Period	Objective	Concentration	Comment
$PM_{2.5}$	Annual	Limit value	25 µg/m^3	
PM_{10}	24 hours	Limit value	50 µg/m^3	Not to be exceeded more than 35 days per year
PM_{10}	Annual	Limit value	40 µg/m^3	
NO_2	Hourly	Limit value	200 µg/m^3	Not to be exceeded more than 18 hours per year
NO_2	Annual	Limit value	40 µg/m^3	
SO_2	Hourly	Limit value	350 µg/m^3	Not to be exceeded more than 24 hours per year
SO_2	24 hours	Limit value	125 µg/m^3	Not to be exceeded more than 3 days per year
CO	Maximum daily 8-hours mean	Limit value	10 mg/m^3	

Table 5.4. WHO Ambient Air Quality Guidelines

Pollutant	Averaging Period	Concentration
$PM_{2.5}$	24 hours	15 µg/m^3
$PM_{2.5}$	Annual	5 µg/m^3
PM_{10}	24 hours	45 µg/m^3
PM_{10}	Annual	15 µg/m^3
NO_2	Hourly	200 µg/m^3
NO_2	Annual	10 µg/m^3
NO_2	24 hours	25
SO_2	24 hours	40 µg/m^3
CO	Maximum daily 8 hour mean	10 mg/m^3

Project Standards: Based on the above, and the range of averaging periods used by Uzbekistan, EU, WBG/IFC and WHO, a blend of project standards will be used as follows:

Table 5.5. Project Air Quality Standards

Pollutant	Averaging Period	Concentration	Comment
$PM_{2.5}$	Annual	5 µg/m^3	IFC Guideline Limit
$PM_{2.5}$	24 hours	15 µg/m^3	IFC Guideline Limit
PM_{10}	24 hours	45 µg/m^3	Not to be exceeded more than 35 days per year
PM_{10}	Annual	15 µg/m^3	IFC Guideline Limit
NO_2	Hourly	200 µg/m^3	Not to be exceeded more than 18 hours per year
NO_2	24 hours	25 µg/m^3	IFC Guideline Limit
NO_2	Annual	10 µg/m^3	IFC Guideline Limit
SO_2	Hourly	350 µg/m^3	Not to be exceeded more than 24 hours per year
SO_2	24 hours	40 µg/m^3	IFC Guideline Limit
CO	24 hours	4 mg/m^3	National Limit

Note: Green cells indicate limits used for baseline monitoring.

5.5.2 Noise

National Standards - No. 0331-16 Admissible noise level in the living area, both inside and outside the buildings is used to ensure the rules of acceptable noise levels for residential areas in Uzbekistan. These rules and regulations establish permissible noise parameters in residential, public buildings and residential buildings of populated areas created by external and internal sources, as well as general requirements for measurements, measurement methods and hygienic noise assessment at research sites. Evaluation of the sound level at the calculation point is performed for the day and night period of the day (from 7 to 23 hours and from 23 to 7 hours) and takes into account the maximum intensity of the sound source level during the half-hour period. Table 5.6 presents the permissible noise levels in the territories that are most significant for the project. The levels are almost identical to IFC standards shown below, with the exception of the periods where IFC are slightly more stringent. As such IFC guideline limits will be used for the Project.

Table 5.6. Noise limits from SanPiN No. 0331-16

Purpose of premises or territories	Time	SanPiN No. 0267-09
Territories adjacent to homes, clinics, dispensaries, rest homes, boarding houses, nursing homes, child care facilities, schools and other educational institutions, and libraries.	From 7 am to 11 pm From 11 pm to 7 am	55 dB(D) 45 dB(A)

WBG Standards – To meet WBG guideline requirements, noise impacts should not exceed the levels presented in Table 5.7 or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site. National and WBG standards are broadly similar, but with WBG night time being defined from 22.00.

Table 5.7. WBG Noise Level Guidelines

Receptor	One-hour L_{aeq} (dBA)	
	Daytime 07.00 – 22.00	Night-time 22.00 – 07.00
Residential; institutional; educational	55	45
Industrial; Commercial	70	70

Project Standards: – Although IFC/WBG and Uzbekistan legal noise standards are very similar IFC guidelines are slightly more stringent with a longer night period. Therefore, IFC /WBG standard for noise shall be adopted for the Project, being the more stringent. However, it should also be noted that the

Government of the Republic of Uzbekistan is set to increase fines on noise regulation violations, especially the night-time noise levels.

5.5.3 Water Quality

Potable water supply to the site(s) shall comply with water quality requirements under the Law of Uzbekistan - Act 950:2000 regarding drinking water quality standards.

Project Standards: An initial water quality test was conducted during preparation of the Ramitan EIS, in August 2023. The Positive Conclusion of the Ecological Expertise to the Ramitan EIS requires that the design of the WWTP must ensure treated wastewater effluent release into the collector shall be such that ambient water quality (before and after the mixing point) is to Fish Pond standard in accordance with the requirements of "Hygienic requirements for surface waters in the Republic of Uzbekistan" (SanPiN 0318-15). For water quality parameters not included in the Fish Farm standard, the more stringent measurement shall be followed (refer to Table 5.8). It shall be noted by the Contractor, that the exact required water quality standards used in operation, shall be reviewed and issued through the Final EIA (ZEP, using local Russian acronym) and the Positive Conclusion of the Ecological Expertise to the ZEP, prepared and released at directly prior to commissioning stage.

Table 5.8. SanPiN 0318-15 – Quality of pollution in the surface water bodies (mg/l)

Parameters	Fish Farms	Cultural- Domestic	Domestic Drinking	Irrigation
COD. mgO_2/l	15	40	30	40
BOD_{20}. mgO_2/l	3	3-6	3-7	10
pH	6.5 – 8.5	6.5 – 8.5	6.5 – 8.5	6.5 – 8.5
Suspended Solids	15	30	30	50
Mineralization	1000	1000	1000-1500	1000
Sulphates	100	500	400-500	
Chlorides	300	350	250-350	
Ca	190			
Mg	40			
Nitrogen ammonium - Salty Ammonium (NH_4^+)	0.5	2	0.5	1.5
Nitrogen nitric (NO_2^-)	0.02	0.5	3	0.5
Nitrogen Nitrate (NO_3^-)	9.1	25	45	25
Nitrite	0.08	3.3	3	
Nitrates	40	45	45	
Phosphates (PO_4^{3-})	0.3	1	3.5	1
Ether-soluble	0.05	0.8	0.8	0.8
Oil products	0.05	0.3	0.1	0.3
Synthetic surface-active agents	0.01	0.5	0.5	0.5
Phenol	0.001	0.001	0.001-0.1	0.001
Fluorine (F)	0.05	1.5	0.7	1
Arsenic (As)	0.05	0.05	0.05	0.1
Iron (Fe)	0.05	0.5	0.3-3	5
Chromium (Cr^{6+})	0.001	0.1	0.05	0.1
Copper (Cu)	0.001	1	1	1
Zinc (Zn)	0.01	1	3	5

Parameters	Fish Farms	Cultural- Domestic	Domestic Drinking	Irrigation
Cyanides	0.05	0.1		
Saturn (Pb)	0.03	0.1	0.03	0.2
Nickel (Ni)	0.01	0.1	0.1	
Cadmium (Cd)	0.005	0.01		
Cobalt (Co)	0.1	1		
Molybdenum (Mo)	0.0012	0.05	0.25	
Strontium (Sr^{2+})		2	7	
Selenium (Se)	0.01		0.01	
Rhodanide	0.1			
Mercury (Hg)		0.005	0.005	

In addition to the above, the WBG provides guidelines values for treated sanitary sewage discharges. The following table provides these values with which the Project shall also comply, for example relating to any wastewater discharge from construction camps (see Table 5.9).

Table 5.9. WBG Indicative Values for Treated Sanitary Sewage Discharges

Pollutant	Unit	Guideline Value
pH	pH	6-9
Biological Oxygen Demand (BOD)	mg/l	30
Chemical Oxygen Demand (COD)	mg/l	125
Total Nitrogen	mg/l	10
Total Phosphorus	mg/l	2
Oil and Grease	mg/l	10
Total Suspended Solids	mg/l	50
Total Coliform Bacteria	MPN[A] / 100 ml	400

5.5.4 Waste Management

The State Ecological Expertise, in their "positive conclusion to the Draft EIS" issued in October 2023 (see *Annex 2*), describes the amounts of waste that may be produced during the Project. Waste Management and Handling will encompass:

- Domestic waste
- Waste oils, waste material
- Hazardous materials

The Contractor shall follow the standards for waste disposal in the Republic of Uzbekistan through the regulation of the Decree of the Cabinet of Ministers of the Republic of Uzbekistan No 14 from 21.01.2014. This outlines wastes determined by hazard class by using a set classification catalogue of waste determined by five levels of hazard, as presented in Table 5.10. Level of waste prescribed in the table shall be a determinant in how the specific waste product is disposed both during construction and operation.

Table 5.10. Classes of Hazards

Level	Waste classification type
I	Highly Hazardous

Level	Waste classification type
II	Hazardous
III	Moderately Hazardous
IV	Slightly Hazardous
V	Non-hazardous

5.5.5 Legal Framework and SanPiN Variations

The Supervision Consultant, with contractor and Employer shall be responsible for ensuring any updates of any of the above standards Uzbekistan Standards are covered within the project detailed designs, construction and commissioning of the sewage pipe network, Pumping stations, Wastewater Treatment Plant and collector. Uzbekistan government agencies supervise and require commissioning of infrastructure based on the standards that are the most recently issued versions for example, there is a recent change in the “permissible hygienic standards”.

According to the resolution of the Committee of Sanitary-Epidemiological Welfare and Public Health under the Ministry of Health of the Republic of Uzbekistan dated 08/07/2023 No. 18 On approval of permissible hygienic standards for the content of harmful and toxic substances, producing microorganisms, bacterial compounds and air ions in the atmospheric air of residential premises (SanPiN No. 0053-23) Sanitary rules and regulations. Hygienic standards of maximum permissible concentrations (MPC) of pollutants in the atmospheric air of populated areas on the territory of the Republic of Uzbekistan.

This resolution, Appendix 2, contains lists of sanitary rules, norms and hygiene standards recognized as no longer in force:

1) SanPiN RUz No. 0293-11 Hygienic standards list of maximum permissible concentrations (MAC) of pollutants in the atmospheric air of populated areas on the territory of the Republic of Uzbekistan.
2) SanPiN RUz No. 0147-04 Maximum permissible concentrations (MPC) of producing microorganisms in the atmospheric air of populated areas of the Republic of Uzbekistan
3) SanPiN RUz No. 0148-04 Maximum permissible concentrations (MPC) of bacterial preparations and their components in the atmospheric air of populated areas of the Republic of Uzbekistan
4) SanPiN RUz No. 0124-01. Sanitary rules and norms of permissible levels of air ionization in residential, public and industrial buildings.

The recent Presidential Decree No. 51 was issued on 12 February 2025. It is titled “Decree of the President of the Republic of Uzbekistan No. Pk-51 Of 11.02.2025 "On Additional Measures For Improving Mechanisms Of Project Preparation And Realization With The Participation Of International Financial Institutions And International State Financial Organizations". Given that this decree is recent and was issued at such an advanced stage in this Project, it is uncertain if any parts of this decree will be valid in future stages of project implementation, completion and operations.

5.6 Permits and Licenses

Required permits and licenses related to the Project based on local legal requirements are listed in Table 5.12.

5.7 International Conventions and Agreements

5.7.1 International Labor Conventions

As a member of the International Labor Organization (ILO) since 1992, Uzbekistan has ratified 17 ILO conventions as set out in the sections and tables below.

Measures have been enacted via a national action plan to implement these conventions into national law, including a legal and institutional framework to prevent forced labor. The legislation of the Republic of Uzbekistan (Constitution, Labor Code, Law on Employment) prohibits the use of child and forced labour. Article 7 of the Labor Code stipulates that forced labor, namely compulsion to perform work under the threat of some form of punishment (including as a means of labor discipline) is prohibited.

5.7.2 Environmental-Related International Conventions

Fundamental conventions and agreements (in addition to the ILO conventions mentioned above) signed and ratified by Uzbekistan that are relevant to the Project are listed in Table 5.11 to Table 5.14.

For example, according to the United Nation's website on the 17 Sustainable Development Goals/SDGs (and 169 Targets), which was reviewed by NOD in January 2025, the following is stated:

'*Uzbekistan has confirmed its commitment to the achievement of the global 2030 Agenda and an inclusive, multi-stakeholder partnership approach for the realisation of the national Sustainable Development Goals (SDGs). The current national medium-term plan, the 2017-2021 National Action Strategy, serves as a pathway towards SDG implementation. To ensure that the SDGs are prioritised throughout all ministries, the Government of Uzbekistan in October 2018 endorsed and adopted a resolution on the 2030 Agenda, which reinforced commitment to align SDGs to national strategies and programmes. The Government adopted 16 national SDGs, 125 related targets, and 206 indicators to facilitate monitoring of their implementation'*.

The 16 national SDGs[10] that Uzbekistan has signed up to includes UN SDG5 Gender Equality, SDG13 Climate Action, and SDG6 Clean Water and Sanitation - Ensure Availability and Sustainable Management of Water and Sanitation for All. SDG6 Targets (8 no.) are set out in Table 5.11 and an overview of required permits and licenses, Labor Conventions and other Conventions ratified by Uzbekistan and relevant to the Project are set out in Table 5.12, Table 5.13 and Table 5.14 below.

Table 5.11. UN SDG6 Clean Water and Sanitation - Targets

Target No.	Target Heading	Description
6.1	Safe and Affordable Drinking Water	By 2030, achieve universal and equitable access to safe and affordable drinking water for all.
6.2	**End Open Defecation and provide Access to Sanitation and Hygiene**	**By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.**
6.3	**Improve Water Quality, Wastewater Treatment and Safe Reuse**	**By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.**
6.4	Increase Water-use Efficiency and Ensure Freshwater Supplies	By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.

[10] Uzbekistan has not been required to sign up to SDG14 Life Below Water as it is a landlocked country.

6.5	Implement Integrated Water Resources Management	By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.
6.6	Protect and Restore Water-related Ecosystems	By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.
6.7	**Expand Water and Sanitation Support to Developing Countries**	**By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.**
6.8	**Support Local Engagement in Water and Sanitation Management**	**Support and strengthen the participation of local communities in improving water and sanitation management.**

Table 5.12. Required permits and licenses

Permit / Required Activity	Permit Title	Issuing Authority	Implementing Law	Responsible Party for providing / Obtaining License
Pre-construction / Construction				
Construction activities	Construction Permit	Hokimiyats of the Project region	·Resolution of the Oliy Majlis of the Republic of Uzbekistan "On the list of activities for which a license is required" No. 222-II of 12.05.2001; ·Resolution of the Cabinet of the Republic of Uzbekistan No. 54 of 02/25/2013. Appendix 1 "Regulations on the procedure for granting land plots in populated areas for the implementation of urban planning activities of design and registration of construction objects, as well as the acceptance into operation of objects" (if and where required)	Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU), UzSuvta'minot.
Construction activities *	The Positive Conclusion of SEE for the national EIA report (Stage I and/or Stage II)	The SCEEP	·Law «On Nature Protection» (1992); ·Law of the Republic of Uzbekistan "On Ecological Expertise" (2000); and ·Regulations "On the State Environmental Expertise" (SEE), approved by the Resolution of the Cabinet of Ministers No. 541 "On further improvement of the environmental impact assessment mechanism' (2020).	Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU), UzSuvta'minot.
Construction* activities	Receipt of agreement on land acquisition (if required for Project) from local authorities	Hokimiyats of Project region	·Law No781 "On land acquisition for public needs with compensation" dated on 29.06.2022	Hokimiyats / Project Coordination Unit (PCU), UzSuvta'minot.
Construction activities	Cultural Heritage Clearance	Agency on Cultural Heritage under Ministry of Tourism and cultural heritage/National	·Law on the Protection and Use of Cultural Heritage Objects (2001)	Project Coordination Unit (PCU), UzSuvta'minot

Permit / Required Activity	Permit Title	Issuing Authority	Implementing Law	Responsible Party for providing / Obtaining License
		Centre for Archaeology		
Pre-commissioning				
Construction activities	The Positive Conclusion of SEE for the national EIA report (Stage III) - ZEP	The SCEEP	·Law «On Nature Protection» (1992); ·Law of the Republic of Uzbekistan "On Ecological Expertise" (2000); and ·Regulations "On the State Environmental Expertise" (SEE), approved by the Resolution of the Cabinet of Ministers No. 541 "On further improvement of the environmental impact assessment mechanism' (2020).	Project Coordination Unit (PCU), UzSuvta'minot.
Construction activities	Visual geological-engineering conclusion	O'zGASHKLITI	·Decree of the Cabinet of Ministers RUz No. 222 "On Improving the System of Permitting Procedures and State Supervision in the Sphere of Urban Planning" ·Urban Development Code of the Republic of Uzbekistan	Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU), UzSuvta'minot.
Waste discharge	Waste passport		·Oz RH 84.3.18: 2005. Regulation Document on Production and consumption waste.	Contractor / Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU), UzSuvta'minot.
Hazardous materials transport and storage	Hazardous materials permission	"Kishlokkimyo" (Agricultural Chemicals)	·The Order No. 2438 of March 20, 2013	Contractor / Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU), UzSuvta'minot.
Construction activities	SPZ permits	·Relevant Regional Hokimiyats, and relevant Regional Department of Ecology and Environmental Protection Sanitary-epidemiological welfare and public health service of RUz	·ShNK 2.05.02 – 07 "Roads" ·SanPiN 0339-16 "On sanitary rules and norms for planning and construction works of living settlements"	Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU), UzSuvta'minot.
Underground water abstraction	Mineral extraction license	State Committee on Geology and Mineral Resources	·Decree of the Cabinet of Ministers RUz number 443 of 12.06.2018. Regulations on the procedure for issuing licenses for the right to use subsoil areas containing non-metallic minerals	Contractor / Owner of Borrow-pit site / /State Ecological and Environmental Protection Committee / State Ecological Expertise / State

Permit / Required Activity	Permit Title	Issuing Authority	Implementing Law	Responsible Party for providing / Obtaining License
				Committee on Geology and Mineral Resources
Construction of roads (road excavation and repairs)	Approval of construction or upgrade activities	State Inspectorate for quality control of roads and construction works under the Cabinet of Ministers of the Republic of Uzbekistan	·Law of the Republic of Uzbekistan "On Automobile Roads"	Contractor / Hokimiyat / Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU),
Transportation of oversized and overweight cargo	Transportation permit	State Committee of the Republic of Uzbekistan on highways	·Decree of the Cabinet of Ministers RUz No 11 of January 11, 1995 "On the procedure for the entry, stay, transit and departure of foreign road carriers from the territory of Uzbekistan"	Contractor / Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU)
Soil and other waste disposal	Soil disposal approval	Goskomekologiya Waste department	·Law "On Subsoil" dated May 8, 2012 · Decree of the Cabinet of Ministers of the RUz No. 14 dated 01.21.2014 regarding classifications of waste.	Contractor / Hokimiyat / Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU)

* These items have been completed during the ESIA preparation stage.

Table 5.13. Labor Conventions ratified by Uzbekistan

Convention	Date
Universal Declaration of Human Rights (1948)	1991
CCPR - International Covenant on Civil and Political Rights (1966)	28-Sep-95
Convention on the Elimination of All Forms of Intolerance and of Discrimination Based on Religion or Belief (1981)	30-Aug-97
C029 - Forced Labor Convention, 1930 (No. 29)	13-Jul-92
P029 - Protocol of 2014 to the Forced Labor Convention, 1930	16-Sep-19
C087 - Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87)	12-Dec-16
C098 - Right to Organise and Collective Bargaining Convention, 1949 (No. 98)	13-Jul-92
C100 - Equal Remuneration Convention, 1951 (No. 100)	13-Jul-92
C105 - Abolition of Forced Labor Convention, 1957 (No. 105)	15-Dec-97
C111 - Discrimination (Employment and Occupation) Convention, 1958 (No. 111)	13-Jul-92
C138 - Minimum Age Convention, 1973 (No. 138) Minimum age specified: 15 years	06-Mar-09
C182 - Worst Forms of Child Labor Convention, 1999 (No. 182)	24-Jun-08
C081 - Labor Inspection Convention, 1947 (No. 81)	19-Nov-19
C122 - Employment Policy Convention, 1964 (No. 122)	13-Jul-92
C129 - Labor Inspection (Agriculture) Convention, 1969 (No. 129)	19-Nov-19
C144 - Tripartite Consultation (International Labor Standards) Convention, 1976 (No. 144)	13-Aug-19
C047 - Forty-Hour Week Convention, 1935 (No. 47)	13-Jul-92
C052 - Holidays with Pay Convention, 1936 (No. 52)	13-Jul-92
C103 - Maternity Protection Convention (Revised), 1952 (No. 103)	13-Jul-92
C135 - Workers' Representatives Convention, 1971 (No. 135)	15-Dec-97
C154 - Collective Bargaining Convention, 1981 (No. 154)	15-Dec-97
CEDAW - Convention on the Elimination of All Forms of Discrimination against Women	19-Jul-95
C187 - Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187)	14-Sep-21

Table 5.14. Conventions relevant to the Project that have been ratified by Uzbekistan

ENVIRONMENT / CLIMATE CHANGE CONVENTIONS
United Nations Framework Convention on Climate Change (UNFCC) (New York, 1992) (Official Gazette of RM no. 61/97) including Paris Agreement (joined April 2017)
United Nations Convention on Biological Diversity (Official Gazette of RM no. 54/97)
United Nations Convention to Combat Desertification (UNCCD) (26/12/2006)
Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (05/26/1993)
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (12/22/1995)
The Convention on the Protection and Use of Transboundary Watercourses and International Lakes
Convention on the Elimination of All Forms of Discrimination against Women (signed 1995)
Convention Concerning the Protection of the World's Cultural and Natural Heritage (ratified 1993)

ENVIRONMENT / CLIMATE CHANGE CONVENTIONS
Convention for the Safeguarding of the Intangible Cultural Heritage. Paris (ratified 2008)
Convention on International Trade in Endangered Species of Wild Fauna and Flora (07/01/1997)
Convention on the Conservation of the Migratory Species of Wild Animals (Bonn Convention) (05/01/1998)
Convention on Wetlands of International Importance especially the Water Fowl Habitats of Aquatic Birds (Ramsar Convention) (1975) (ratified 2001)
Vienna Convention for the Protection of the Ozone Layer (1985).
Montreal Protocol to Protect the Ozone Layer (including 1990 and 1999 amendments)
Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, 1991) - the 'Espoo (EIA) Convention'
Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters (Aarhus Convention) (Official Gazette of RM no. 40/99)

5.8 AIIB Environmental and Social Framework

The Asian Infrastructure Investment Bank (AIIB) has approved a Loan for the development of the Bukhara region Water Supply and Sewerage Project (BRWSSP) that includes water supply (Component1); Sanitation (Component 2); and Capacity Building (Component 3). The Project components will be implemented by UzSuvta'minot JSC, specifically the Bukhoro Suv Ta'minoti JSC in the Bukhara region. By the Uzbekistan Government receiving the loan, they are legally bound, through the Loan Agreement, to comply with Uzbekistan Legal Framework, BRWSSP ESMPF and the AIIB Environmental and Social Framework. As an IFI, the Loan Agreement is legally implementable under the Constitution of Uzbekistan, but must be complied, regardless of the remaining legal Framework of Uzbekistan. This is why a "Gap Analysis has been performed (refer to Section 5.9). Given that there are no Indigenous Peoples groups in the Bukhara region, Environmental and Social Standard 3 (ESS3) is not applicable to this Project. Only Environmental and Social Policy, Environment and Social Standards 1 and 2 apply to the Project situation in Ramitan. This section describes the AIIB Environment and Social Standard 1 (ESS1) "Environmental and Social Assessment and Management"; and Environment and Social Standard 2 (ESS2) "Involuntary Resettlement".

a) Environmental

The AIIB requires that a project is assessed and is implemented in accordance with its Environmental and Social policies, in accordance with the "Environmental and Social Standard 1" (ESS 1). The Environmental and Social Standard 1 (ESS 1) applies if the Project is likely to have adverse environmental risks and impacts or social risks and impacts (or both). The scope of the environmental and social assessment and management measures are proportional to the risks and impacts of the Project. ESS 1 provides both for quality environmental and social assessment and for management of risks and impacts through effective mitigation and monitoring measures during Project implementation.

To achieve the environmental and social soundness and sustainability of the Project and to support the integration of environmental and social considerations into the Project decision-making process and implementation.

b) Resettlement

The AIIB checks each project for involuntary resettlement and displacement, which covers both physical and economic displacement in accordance with the "Environmental and Social Standard 2" (ESS 2).

The objectives of this ESS 2 are:

i. to avoid involuntary resettlement as much as possible.
ii. to minimize involuntary resettlement by exploring alternative options.
iii. where it is impossible to avoid involuntary resettlement, improve or at least restore the livelihoods of all resettled persons in real terms relative to the standard of living preceding the project.
iv. to understand and eliminate gender risks and various consequences of involuntary resettlement.
v. to improve the overall socio-economic status of the poor and other vulnerable groups of the population.
vi. implement resettlement activities as sustainable development programs, providing sufficient resources to allow persons displaced by the project to participate in the distribution of project profits.

If the Project provides for involuntary resettlement, the AIIB requires that a Resettlement Plan or a Resettlement Policy Basis be prepared (depending on the circumstances), which is proportional to the impact level. The impact level is determined by: (a) the scale of physical and economic displacement; and (b) the vulnerability of the affected people. The RP or RPF complements the broader coverage of social risks and impacts in environmental and social assessment and provides specialized guidance to address specific issues related to involuntary resettlement, including land acquisition, changes in land use rights, displacement, and the need to restore livelihoods.

The AIIB does not support illegal settlement. However, it recognizes that a significant part of the population already inhabits both urban and rural lands without property rights or recognized land rights in the countries of their activity. Given this situation, the AIIB requires that displaced persons without a right, or any recognized legal rights, to land have the right to receive resettlement assistance and compensation for the loss of non-land assets, in accordance with the cut-off dates set out in the resettlement plan, and their inclusion in the resettlement consultation process.

c) Other AIIB Safeguards Requirements

Although key ESS's related to the Project are ESS 1 on Environment and ESS 2 on Resettlement, the AIIB "Environmental and Social Framework", revised in 2021, also requires the following to be considered in all projects it finances:

- Screening and Categorization – Overall, the Ramitan Sanitation Project has been classified as Category A.
- Consultation, which is meaningful and effective continued in a timely manner from project preparation stage to completion.
- Disclosure of Environmental and social documentation on the EA website.
- Grievance Redress System is devised for the Project, but must allow the for the affected person, at any time to use the normal or traditional methods of complaint.
- Safety of Dams – which is not relevant for the case of Ramitan
- Assessment and management of Environmental and Social impact issues.
- Health and Safety of both workers and communities.
- Labor and working conditions in compliance with both ILO standards and Uzbekistan regulations.
- Policy on Project Affected-People Mechanism.
-

5.9 Gap Analysis

Common to all IFIs, the financing donor policy and/or frameworks shall be complied along with the legal framework of Uzbekistan. To ensure compliance, this section presents a summary of gaps between the AIIB Environmental and Social policy and Uzbekistan legal Framework.

5.9.1 ESS 1: Environmental

Table 5.15 presents the gap analysis extracted from the “Bukhara Water Supply and Sewerage Project Environmental and Social Management Planning Framework” (BRWSSP - ESMPF) with updates, where applicable, in the Laws of Uzbekistan.

Table 5.15. Gap Analysis - Environmental

Aspect	AIIB	National Regulations Of Uzbekistan	Harmonized Framework Requirement
Environmental Policy and Regulations	There are AIIB Environmental and Social Framework, Environmental and Social Policy and Environmental and Social Standards	The main Environmental related legal framework focusses on the following: (i) Presidential Decree of April 21, 2017 No. UP-5024 "On improving the system of public administration in the field of ecology and environmental protection"; (ii) Resolution of the President of the Republic of Uzbekistan of April 21, 2017 No. PP-2915 “On measures to ensure the organization of the activities of the State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection”; (iii) Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated January 15, 2019 No. 29 “On Approving the Provision on the State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection”; (iv) Resolution of the President of the Republic of Uzbekistan dated October 3, 2018 No. PP-3956 “On measures to ensure the organization of the activities of the State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection”; (v) Resolution of the President of the Republic of Uzbekistan, dated 30.12.2021, №-76 "On measures for environmental protection and organization of activities of state bodies in the field of environmental control"; (vi) RCM of RUz dated September 7, 2020. No. 541 “On measures for the further improvement of	In most of the cases national requirements and standards for environment quality are matching with AIIB Policy and Standards (For example, the Environmental Impact Assessment is compulsory for both requirements). However, there are some parameters when national and AIIB requirements and standards are different (For example, National legislation does not require a preparation of separate EMP, environmental monitoring or any other environmental documents/plans/checklists for project). In such cases more stringent provisions is applied for the Ramitan project. A Screening, Scoping and Risk Management study was conducted for the specific Ramitan Sewerage Project. The study indicated that an ESIA with ESMP plus SSDR and associated documentation should be prepared. The study also determined that only water testing of the collector canal is required, at the time of this ESIA data collection period, because it would be a significant factor in the WWTP design and treated water quality level required to dispose into the collector canal. However, in accordance with Environmental monitoring of AIIB, independent laboratory testing is to be implemented, by the contractor directly before the, during and directly after the Construction for air, noise and vibration and water

Aspect	AIIB	National Regulations Of Uzbekistan	Harmonized Framework Requirement
		environmental impact assessment"; (vii) Presidential Decree of May 31, 2023 No. 81 "On improving the system of public administration in the field of ecology and environmental protection; (viii) Resolution of the President of Uzbekistan of May 31, 2023 No. PP-171 "On measures to ensure the organisation of the activities of the State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection. (ix) other laws and by-laws related to nature protection. Additionally, the Uzbekistan EIA procedure is regulated by: • Law of the Republic of Uzbekistan "On Ecological Expertise" (2000); and • Regulations "On the State Environmental Expertise", approved by the Resolution of the Cabinet of Ministers No. 541 "On further improvement of the environmental impact assessment mechanism' (2020).	quality and waste management (refer to Section 11 below).
Screening and Categorization	AIIB carries out project screening and categorisation at the earliest stage of project preparation when sufficient information is available for this purpose. In the case where AIIB and national categorization requirements differ, the more stringent requirement will apply. This refers mostly in the case of deciding about Category C subprojects - the national EA legislation doesn't refer to small scale activities, including construction and rehabilitation of	The Resolution No. 541 specifies the legal requirements for EIA in Uzbekistan. the State Environmental Expertise (SEE) to conduct an environmental examination, which the project is then classified as categories I, II or III, of environmental impact (high and medium risk); Projects categorized IV or V are low or no impact and only require draft EIA approval and no Final EIA at the end of the project construction period – Statement of Ecological Consequences (ZEP in Russian language) National EIAs in Uzbekistan consist of three stages to obtain the Environmental Approval:	A Screening, Scoping and Risk Management study was conducted for the specific Ramitan Sewerage Project. Although some risks were categorized as High risk, most of the risks identified are able to be mitigated effectively, and thus categorised under defined AIIB ESS1 as a Category A Project. It is mandatory that the Uzbekistan legal process EIA Process is complied, otherwise the Project will not be approved at the project commissioning stage and may be liable for payment of maximum environmental related (e.g. Polluter pays)

Aspect	AIIB	National Regulations Of Uzbekistan	Harmonized Framework Requirement
	various buildings. In these cases, the client will apply the AIIB criteria. Categorization into Category A, B, C, FI The project categorization depends on location, component presenting the highest environmental or social risk, including direct, indirect, cumulative and induced impacts, as relevant, in the Project area.	• Stage I - Preliminary EIA report – initial and mandatory stage. • Stage II – Statement on Environmental impacts is a non-mandatory stage and can be skipped if local regulator is satisfied with assessment provided in Preliminary EIA report (EIS). • Stage III – Statement on Environmental Consequences - is the final stage and output that should be prepared and submitted to the regulator after completing construction/reconstruction works and before the commissioning of the project (ZEP).	fines, regardless of environmental impact. An updated EIS (ZVOS) with positive Conclusion of the Ecological Expertise for a Category II/III project has been finalized (*Annex 1 and 2*), with results requiring • A Final EIA (ZEP) be prepared, prior to project commissioning stage. • Supervision of construction to ensure the final product of the Project is in fitting with Uzbekistan regulations. • To provide finalized standards, based on the ambient environmental conditions at the time, expected technology performance constructed under the project and existing environmental legal standards at the time of the project completion.
Environmental Impact Assessment Report	In accordance with Environmental and Social Policy, ESIA processes report for category A projects includes the following chapters: (a) description of the Project; (b) policy, legal and administrative framework, including the international and national legal framework applicable to the Project; (c) scoping, including stakeholder identification and consultation plan; (d) analysis of alternatives, including the "without Project" situation; (e) baseline environmental and social data; (f) evaluation of environmental and social risks and impacts; (g) public consultation and information disclosure; and (h) development of mitigation, monitoring and management measures and actions in the form of an ESMP or ESMPF.	Resolution No. 541 (2020) defines content of EIA report for project belonged to categories I-III. The report has to include: (i) baseline data, (ii) project description, (iii) anticipated environmental impacts, (iv) waste management, (v) analysis of emergency situation, and (vi) and anticipated changes due to project implementation. Information on applicable laws and regulation usually is presented in "Introduction" part. For the projects category IV and V, the EIA report is more simplified.	

Aspect	AIIB	National Regulations Of Uzbekistan	Harmonized Framework Requirement
ESMP	An ESMP should be prepared and should specify, along with the proposed mitigation activities, a monitoring plan and reporting requirements, institutional arrangements for ESMPs implementation.	National legislation on EIA requires to identify possible impacts, but it does not require a preparation of separate EMP or any other environmental documents/plans/checklists. There are no requirements on environmental monitoring with specification of monitoring parameters and location. However, the State Ecological Expertise in its Positive conclusion to the EIS and subsequent post-construction ZEP, does provide the respective requirements for monitoring of construction to ensure a project' product meet the Uzbekistan post-project requirement. There is minimal instruction provided in terms of construction environmental management and monitoring	Based on results of sub-projects screening, and impact assessment studies, a detailed ESMP is to be developed to ensure high standard of Environmental management is achieved before, during and after construction of the Ramitan Sewerage Project.
Public Consultations and Disclosure	The Sub-borrower is responsible for conducting at least one meaningful consultation for all Categories A, B and C projects to discuss the issues to be addressed in the EMP or to discuss the draft EMP itself.	The more recent 2021-2022 Environmental legal framework of Uzbekistan does require at least one mandatory public meeting in the affected district. No further consultations are legally required under the Uzbekistan legislation. This may change over time.	A public meeting was held as part of the EIS updating process (*Annex 1 and 3*). Consultations will be carried out with the stakeholders and affected people, in accordance with AIIB requirements, as an AIIB environmental Category A project. Also, in accordance with AIIB requirements, questions and concerns raised during public consultations will be reflected in ESIA and ESMP documents. The feedback received from the Public Consultations is used to finalise and disclose the E&S instruments. Recommendations for further consultations, during construction implementation and Disclosure requirements in accordance with AIIB guidelines shall be prepared along with consultations. Disclosure of this ESIA with its ESMP is also required.
Requirements on Cultural Heritage	AIIB ESS1 requires the development of a Cultural Recourses field-based survey to conserve cultural resources and avoid	The law of Uzbekistan "On protection and usage of cultural heritage objects" states that a project's design for rehabilitation of cultural	In the case of the Ramitan project, no Cultural heritage is expected to be affected by the Project implementation or operation Therefore, a "Cultural Resources

Aspect	AIIB	National Regulations Of Uzbekistan	Harmonized Framework Requirement
	destroying or damaging them under the Project	heritage needs to be approved by the Ministry of Culture. The Ministry of Culture also has jurisdiction over mitigation requirements for cultural heritage identified during construction and not before.	Management Plan" is not required. However, the ESMP under this ESIA for Ramitan will incorporate a "Chance Find Procedure" involving an immediate stop to construction and procedures that involve contacting related authorities for further action.
Requirements on Trees	Loss of trees is more specific to those impacted through land acquisition and resettlement, but not necessarily in the public domain, except for avoidance and minimization of impact on trees and vegetation	There is a decree (DCM-464) which provides for and extends a moratorium on tree cutting on an indefinite basis. Tree Cutting is prohibited under the moratorium. Loss of non-productive and productive trees. Non-productive and productive trees damaged because of implementation of a government project are subject to compensation (refer to ESS 2 Gap analysis below).	Uzbekistan legislation will be complied with as it is more stringent than AIIB in this case of trees in public areas, that do not fit under ESS2 shall remain. In the case of full trees being within the alignment or footprint of the project, on public land, the engineering design shall be varied to suit. Trees where branches inhibit construction will involve written permission from the Ecological Department of Ramitan district, to prune branches, ensuring they will regrow. Pruning will be under the supervision of the Ecological Department of Ramitan district, and supervision consultant. The ESIA will provide for stripping and stockpiling topsoil for reinstatement and revegetation, as needed if caused by the project.
Protected Areas and biodiversity	Projects of High Risk severely affecting Protected areas and biodiversity shall not be considered	The Law on Environmental Control allows for control and protective measures against economically productive projects. Article 7: The objects of environmental control are: • Land, its subsoil, waters, flora and fauna, and atmospheric air; • Natural and man-made sources of impact on the environment; and • Activities, action or inaction that may lead to pollution of the environment and irrational use of natural	There are no protected areas inside the project area at Ramitan. In case of impact on protected and other flora/fauna, mitigations are to be included in the ESMP. The scoping study and subsequent assessments found no need for an "Biodiversity Action Plan" to be prepared.

Aspect	AIIB	National Regulations Of Uzbekistan	Harmonized Framework Requirement
		resources, create a threat to the life and health of citizens.	

5.9.2 ESS 2: Involuntary Land Acquisition and Resettlement

Table 5.16 below presents the gap analysis extracted from the Ramitan SDDR, which covers the ESS-2 standard on Involuntary Resettlement land Acquisition.

Table 5.16. Comparison of national legislation with the AIIB policy on involuntary land acquisition

Aspect	AIIB	National Regulations Of Uzbekistan	Harmonized Framework Requirement
Involuntary Resettlement (IR)	Environmental and Social Standard 2 - Involuntary Resettlement (ESS-2)	Uzbek legislation governing involuntary resettlement and compensation policy: Constitution of the RUz, 1992 Civil Code of the RUz, 1995 Land Code of the RUz, 1998 Housing Code of the RUz, 1998 Law of the Republic of Uzbekistan No. 781 dated 29.06.20222 "On procedures for seizure of land plots for public needs with compensation" dated 01.02.2022 "On Amendments and Additions to Certain Legislative Acts of the Republic of Uzbekistan. 29.08.2024 г. № LUz-950. This Law will serve to strengthen guarantees for the protection of private property and the rights of owners, create additional guarantees and conditions for the free conduct of entrepreneurial activity, and ensure that the possibility of the risk of natural disasters and climate change is taken into account in the design and construction of urban development projects. Decrees and resolutions of the President of the Republic of Uzbekistan:	In most cases, national requirements and standards for involuntary resettlement differ from AIIB Policies and Standards in terms of providing support and compensation to Project Affected Parties (PAPs) without formal titles/legal rights. In such cases, UzSuvta'minot JSC will adhere to the principles of BRWSSP ESMPF and AIIB ESF. In accordance with Decree of the President of the Republic of Uzbekistan No. 3857 dated July 16, 2018 "On measures to improve the efficiency of preparation and implementation of projects with the participation of international financial institutions and foreign government financial organizations", payment of compensation for seizure of land, demolition of houses, other buildings, structures or premises as part of the projects with participation of international financial institutions and foreign government financial institutions, if this is provided for in the agreement on projects implemented by authorized bodies in accordance with the requirements of international financial

Aspect	AIIB	National Regulations Of Uzbekistan	Harmonized Framework Requirement
		- No. PP-3857 dated 16.07.2018. - No. UP-5490 dated 27.07.2018 - No. UP-5495 dated 1.08.2018 - No. UP-5491 dated 03.08.2019 - No. UP-6243 dated 08.06.2021 - No. PP-204 dated 12.04.2022 Resolutions of the Cabinet of Ministers: - No. 146 dated 25.05.2011 - No. 911 dated 16.11.2019 - No. 543 dated 27.08.2021 - No. 482 dated 12.08.2020	institutions and foreign government financial organizations. Thus, the Decree confirms that resettlement costs under the Project will be paid based on valuation documents prepared by the Project Coordination Unit (PCU) in accordance with the BRWSSP ESMPF.
Projects Review and Categorisation	AIIB screens and categorizes projects at the earliest stage of project preparation, when sufficient information is available. Project categories: A, B, C, FI.	Legislation does not provide for categorization in terms of resettlement.	NA
Entitlement to Compensation	A. PAPs who have formal legal rights to the land they occupy.	A. PAPs with formal titles receive compensation for lost land/other assets	A. Similar in essence and application No need for harmonization.
	B. PAPs who do not have formal legal rights to land, but have claims to land recognized or recognizable in accordance with national law, including measures provided for in the draft land policy. C. PAPs who have no recognized legal rights or claims to the land they occupy.	B/C. PAPs with or without legal title. Those legalizable are not distinguished and are considered illegal since legalization is the burden of PAPs. Illegal PAPs are not entitled to compensation for land and non-land assets.	B/C. The critical difference in the essence and application. For illegal and legalized PAPs affected by the project, resettlement assistance will be provided to project-affected parties in accordance with BRWSSP ESMPF. Formal agreement on both points is necessary through additional provisions on guarantees in loan agreements that are equivalent to an international treaty or agreement.
Compensation	A. Permanent loss of land. Replacement land as a preferred option or cash	A. Permanent loss of land. Cash compensation at the	A. PAPs with a formal status will receive compensation

Aspect	AIIB	National Regulations Of Uzbekistan	Harmonized Framework Requirement
	compensation at full market rate. At least for legal / legalized PAPs.	market rate or replacement land for legal/legalized PAPs	for the loss of land. No settlement is required. Harmonization is required to ensure compensation for all non-land losses for legal and illegal PAPs. This can be accomplished by including additional terms in the loan agreement that are equivalent to an international treaty or agreement.
	B. Replacement of leased land. Based on replacing the lost income with cash compensation of gross income x remaining years of lease or by replacement of land lease.	B. Replacement of leased land. Through rental replacement and cash compensation for all losses, including lost profits.	B. Similar essence. No harmonization is required.
	C. Loss of structures/buildings. Cash compensation at replacement cost for the lost facilities without depreciation, operating costs and other deductions.	C. Loss of structures/buildings. Cash compensation at the market value for the lost facilities without depreciation, operating expenditures and other deductions.	C. No need for harmonization of the essence and application. However, a Protocol or additional terms to the loan agreement are required to allow the structures/buildings to be compensated at replacement cost where the salvaged materials remain with the developer or the new owner of the land provides full compensation to the developer.
	D. Loss of indirectly affected assets. Unaffected parts of the asset that will no longer be used after the project impact must also be compensated.	D. Loss of indirectly affected assets. In accordance with the law, losses, including lost profits, are compensated to all legalized PAPs.	D. No need for harmonization of the essence and application.
	E. Loss of business. Compensation for actual losses plus costs of restoring the business. According to application, income for the period of business interruption is declared on the basis of tax. In the absence of tax	E. Loss of business. Cash compensation at the market value for all losses/possible expenditures. The burden of proof of opportunity costs lies with PAPs, based on accepted documentary evidence but without a clear methodology.	E. Similar in essence, but different in application. Harmonization of methodology and distinction between short-term and long-term losses.

Aspect	AIIB	National Regulations Of Uzbekistan	Harmonized Framework Requirement
	returns, based on the maximum untaxed salary.		
	F.	F.	F.
	Loss of trees: i) Non-productive trees. Regardless of the legal status of land possession, compensation is provided at the market rate. Application based on tree type/ volume of timber, or other methods to ensure restoration of the PAP's business. ii) Productive trees. Replacement cost compensation based on various methods: cost of tree reproduction, lost income (type of tree x market value of income for 1 year x total years of production lost).	Loss of non-productive and productive trees. Non-productive and productive trees damaged as a result of implementation of a government project are subject to compensation.	Similar in essence, but different in application. Harmonization of loss assessment methodology.
	G.	G.	G.
	Loss of harvest. Harvest compensation in cash at market price.	Loss of harvest. Loss of harvest must be compensated. Two forms of compensation for crop losses are possible: i) compensation for unfinished agricultural production and ii) compensation for lost profits by multiplying the average (four-year) income over the last three years.	No need for harmonization at the policy level, but application is to be harmonized to ensure that the crops will be compensated at a point as close as possible to the profit settlement date.
Involuntary resettlement planning, impact assessment	Resettlement Action Plan (RAP). Preparation of PP includes: a) impact assessment/census of PAPs; b) identification of rights, income/livelihood restoration strategies, grievance mechanisms, and institutional mechanisms; c) results of consultations; d) monitoring schemes; e) budget and implementation schedule. The following studies are required for resettlement planning: **i. Detailed measurements**	Resettlement Action Plan. There are no requirements for the preparation of comprehensive and separate Resettlement Action Plans (RAP). Preparation of a Land Acquisition Plan (LAR) entails similar but less extensive/simpler assessment/survey efforts than the AIIB policy, as detailed below.	RAP will be prepared in accordance with the Environmental and Social Management Planning Framework (ESMPF) in the event of resettlement impacts caused by sub-projects.
	Measures all affected objects	Impact on land and buildings is measured. Other impacts will be identified but not measured.	

Aspect	AIIB	National Regulations Of Uzbekistan	Harmonized Framework Requirement
	II. Census of PAPs.		
	Identifies all PAPs and establishes legal beneficiaries based on their legal status.	Identifies only legal PAPs.	
	iii. Socio-economic survey		
	Provides background information on the socio-economic characteristics of PAPs.	No comparable requirements exist	
	iv. Valuation (appraisal survey)		
	a) Land: if a land market exists - based on a review of recent transactions; without a land market - based on land productivity/income.	**a) Land:** valued at a market rate based on a survey of transactions. The appraisal includes transaction costs/liabilities of third parties.	
	b) Buildings and structures Cost of replacement materials, labor and transportation, and building/structure features without discounting depreciation, material costs, and transaction costs.	**b) Buildings and structures** Replacement cost, but materials left with the developer or landowner provide full compensation to the owner.	
	c) Trees/agricultural crops Based on the methodology detailed in the Compensation section.	**c) Trees/agricultural crops:** compensation based on the methodology detailed in the Compensation section or agreed lump sum payment.	
Procedural mechanisms	**A. Information disclosure:**		
	Resettlement documents must be disclosed in a timely manner in the language of the PAP.	Legal requirements for information disclosure are established by law.	
	B. Public consultation		
	Meaningful public consultations to be held with PAPs. PAPs must be informed about their rights and opportunities, as well as resettlement alternatives.	Issues of local importance that are publicly discussed with local authorities and PAPs are included in the legislation.	Similar essence and application.
	C. Grievance Redress Mechanism		
	A Grievance Redress Mechanism (GRM) is required for every project. Information about the GRM must be brought to the attention of PAPs.	Each government agency/Ministry follows detailed guidelines (approved by the Government) for registering and addressing community concerns and grievances. New opportunities for filing claims are provided on	Similar in essence, but different in application. Formal harmonization of the details of the application mechanism is required.

Aspect	AIIB	National Regulations Of Uzbekistan	Harmonized Framework Requirement
		virtual government website platforms.	
	D. Conditions for asset alienation		
	Property can only be acquired after full compensation to the PAP.	Property can be alienated only after full payment of compensation to the PAP.	Similar in essence and application.
Assistance to vulnerable and severely affected PAPs	A. These PAPs should be identified and special assistance provided to restore/upgrade their standard of living to the pre-project level.	A. There are no specific laws or regulations for restoration of livelihoods to the pre-project level, due to land acquisition and involuntary resettlement. However, support for socially vulnerable groups is provided on a regular basis by the government at the central and local levels, and does not require additional payments in connection with the project.	A. Significant difference in essence and application. Formal harmonization of the details of the application mechanism is required.

5.10 Institutional Framework of Uzbekistan

This section presents a summary of the key stakeholder institutions involved in the Project.

5.10.1 Cabinet of Ministers of the Republic of Uzbekistan

The Cabinet of Ministers of the Republic of Uzbekistan governs the executive body in the Republic of Uzbekistan following the Constitution of the Republic of Uzbekistan (Article 98), and the Law of the Republic of Uzbekistan "On the Cabinet of Ministers of the Republic of Uzbekistan" (new edition of 2019). The COM exercises the following main functions:

- Implements measures on rational use and protection of natural resources;
- Coordinates the work of state bodies on joint conducting of natural protection events;
- Implements a large-scale ecological program of national and international importance; and
- Takes measures to eliminate the consequences of accidents and disasters as well as natural disasters.

5.10.2 UzSuvta'minot Joint Stock Company and Bukhoro Suv Ta'minoti JSC

The proponent of this Project is the UzSuvta'minot JSC, specifically the Bukhoro Suv Ta'minoti JSC as the implementing agency. The day-to-day activity of the Project is conducted through the Project Coordination Unit (PCU) attached to the Deputy Chairman of the UzSuvta'minot, Board of Investment.

The "UzSuvta'minot" Joint Stock Company was formed under Presidential Decree No. DP-5883 issued on November 26, 2019. **Bukhoro Suv Ta'minoti JSC** is the regional level Joint Stock Company, but with a 100% shareholding by UzSuvta'minot JSC, Government of Uzbekistan.

The main functions of UzSuvta'minot JSC, that are related to the Project, include:

- The development of water supply and sewerage systems.
- Manage responsible consumption of drinking water.
- Renovate (operation and maintenance) of water supply and sewerage infrastructure.
- Provide prompt reduction of accidents, and the delivery of other services.

Bukhoro Suv Ta'minoti JSC is the local operating organization, responsible for providing wastewater services for private and commercial subscribers within Bukhara region. Bukhoro Suv Ta'minoti JSC aims to create the necessary sewage infrastructure and organizational improvements through the introduction of centralized wastewater disposal systems.

5.10.3 Ministry of Ecology, Environmental Protection and Climate Change

The Ministry of Ecology, Environmental protection and Climate Change (MEEPCC) is the legal successor to the rights, obligations, and agreements associated with the tasks and functions of the State Committee on Ecology and Environmental Protection. Similarly, the Forestry Agency succeeds the State Forestry Committee, and the Hydrometeorological Service Agency succeeds the Hydrometeorological Service Center. The primary responsibilities of the MEEPCC include ensuring the implementation of a unified state policy on environmental safety, environmental protection, and the use and reproduction of natural resources; and enforcing state control over the compliance of ministries, state committees, departments, enterprises, institutions, and organisations, as well as individuals, with respect to the use and protection of land, mineral resources, water, forests, flora and fauna, and atmospheric resources. Structurally, the MEEPCC consists of the central unit (located in Tashkent), regional units (oblast) and local (district) units.

5.10.4 The State Ecological Expertise Center

The Centre for State Ecological Expertise Centre's activities are directly related to the evaluation of materials for EIA and the issuance of documents determining compliance with environmental requirements for planned or executed business and other activities, as well as determining the admissibility of the implementation of the object of environmental expertise.

5.10.5 Other Institutions That May Be Involved

The Bukhara State Ecological Expertise's activities are directly related to the evaluation of materials for EIA (EIS and ZEP) and the issuance of documents determining compliance with environmental requirements for planned or executed business and other activities, as well as determining the admissibility of the implementation of the object of environmental expertise. The Bukhara State Ecological Expertise, in their Positive Conclusion to the EIS, in August 2023, requires that the district (Hokimiyat) Environmental department personnel monitor project construction to ensure that installation of the pipe networks, pumping stations and treatment plant are delivered in compliance with the Positive Conclusion and EIS requirements.

Due to the cross-cutting nature of sustainable development and the environment, virtually all other state bodies have some responsibility towards the project. Other stakeholders that may be relevant to the Project, at some stage of the Project and/or its operation phases, are listed below:

- Ministry of Investments, Industry and Trade of the Republic of Uzbekistan.
- Ministry of Transportation and local Hokimiyat authorities.
- Agency of Cultural Heritage of the Republic of Uzbekistan.
- Ministry of Culture of the Republic of Uzbekistan.
- Ministry of Tourism of the Republic of Uzbekistan.
- The Ministry for development of information technologies and communications of the Republic of Uzbekistan.
- Ministry of Construction of the Republic of Uzbekistan
- Ministry of Energy of the Republic of Uzbekistan.
- Ministry for Emergency Situations of the Republic of Uzbekistan.

- Ministry of Health of the Republic of Uzbekistan.
- Ministry of Employment and Labor Relations of the Republic of Uzbekistan.
- Ministry of Water Resources of the Republic of Uzbekistan.
- Ministry of Agriculture of the Republic of Uzbekistan.
- Cadastre Agency under the State Tax Committee of the Republic of Uzbekistan.
- State Committee of the Republic of Uzbekistan on Geology and Mineral Resources.
- State Committee on Forestry of the Republic of Uzbekistan.
- Centre for Hydrometeorological Services under the Cabinet of Ministers of the Republic of Uzbekistan (Uzhydromet).
- State Committee for Industrial Safety of Uzbekistan.
- Ministry of Internal Affairs of the Republic of Uzbekistan

6 ENVIRONMENTAL BASELINE

The Ramitan Sanitation Project is located in Ramitan, which is also the administrative centre of the Ramitan district. The sub-project area includes eight Mahalla Citizens Gatherings (Mahallas), of which seven are located on the territory of the district centre: A. Navoi, Ramitan, Bobur, Uba, Zarafshon, Tarnaut, Afrosiyob, Guliston, Ibin Sino. The Kakhramon Mahalla is under the district's jurisdiction. This section presents the Environmental baseline with a focus on the District of Ramitan.

This section of the ESIA provides a robust baseline of the following environmental factors, as listed in Table 6.1 below.

Table 6.1: Environmental Factors for ESIA Baseline

No.	Environmental Factor
1	Climate & Climate Change
2	Land Cover
3	Soil and Geology
4	Water
5	Air Quality
6	Noise
7	Archaeology & Cultural Heritage
8	Material Assets
9	Biodiversity

6.1 Climate & Climate Change

Climate conditions in the Bukhara Region are influenced by three main factors: general circulation of atmosphere; solar radiation inflow determined by geographical location; and terrain.

Key aspects of climate such as wind, precipitation and drought, temperature and humidity, and climate change all may potentially impact on the Ramitan sewage pipe network, pumping stations and/or treatment plant operations and their impact on the community and the environment. In particular, inclement weather affecting construction schedule; water availability for pipeline and treatment plant intake and the effluent collector canal; temperature and humidity in relation to odours; and climate change conditions affecting forecasts in conditions for both pipeline networks pumping stations and treatment plant operations will have an effect.

The territory of Bukhara is characterised by features of continental climate with large seasonal and daily fluctuations of air temperature. One of the features of the climate is a long summer. In summer, a thermal depression is often present over the Bukhara Region, which consists of a low-mobility area of low pressure resulting in clear, dry and hot weather. The Kyzylkum desert is a hotbed of intense air mass transformation during the warm season. Autumn (September-December) is warm, and partially cloudy, with rains. Winter (December-February) is mild, unstable, with prevailing cloudy weather. Spring (February-April) is characterized by unstable weather, with cloudy cool days followed by sunny and warm days (Table 6.2, Table 6.3, Table 6.4, Table 6.5).

According to long-term observations of weather stations in this region, the average annual temperature is +14.40 °C, in June +26.70 °C, and in January -0.40 °C, the minimum recorded drops to -22.90 °C. The duration of daily average temperatures above 5.0 °C is 240 days. The vegetation period of thermophilic plants (above 10.0 °C) lasts 207 days. The frost-free period is the shortest, 177 days. Frost stops on average around mid-April, the earliest record is on March 4, and the latest on May 22. The

first frosts begin generally at the start of October, the earliest recorded was on September 20, and the latest on October 29 (Table 6.3).

The frequency of wind direction in winter and summer is shown in Table 6.2 and Figure 6.1. This information is valuable to mitigation measures for engineering design and mitigation of construction dust and machine emissions and the new Treatment Plant operations.

Table 6.2. The average monthly wind recurrence according to Bukhara weather station data.

Months / Directions	N	NE	E	SE	S	SW	W	S
January	22	7	14	18	12	9	5	13
July	67	7	1	0	0	1	5	19
Average annual	**44**	**8**	**8**	**7**	**5**	**6**	**6**	**16**

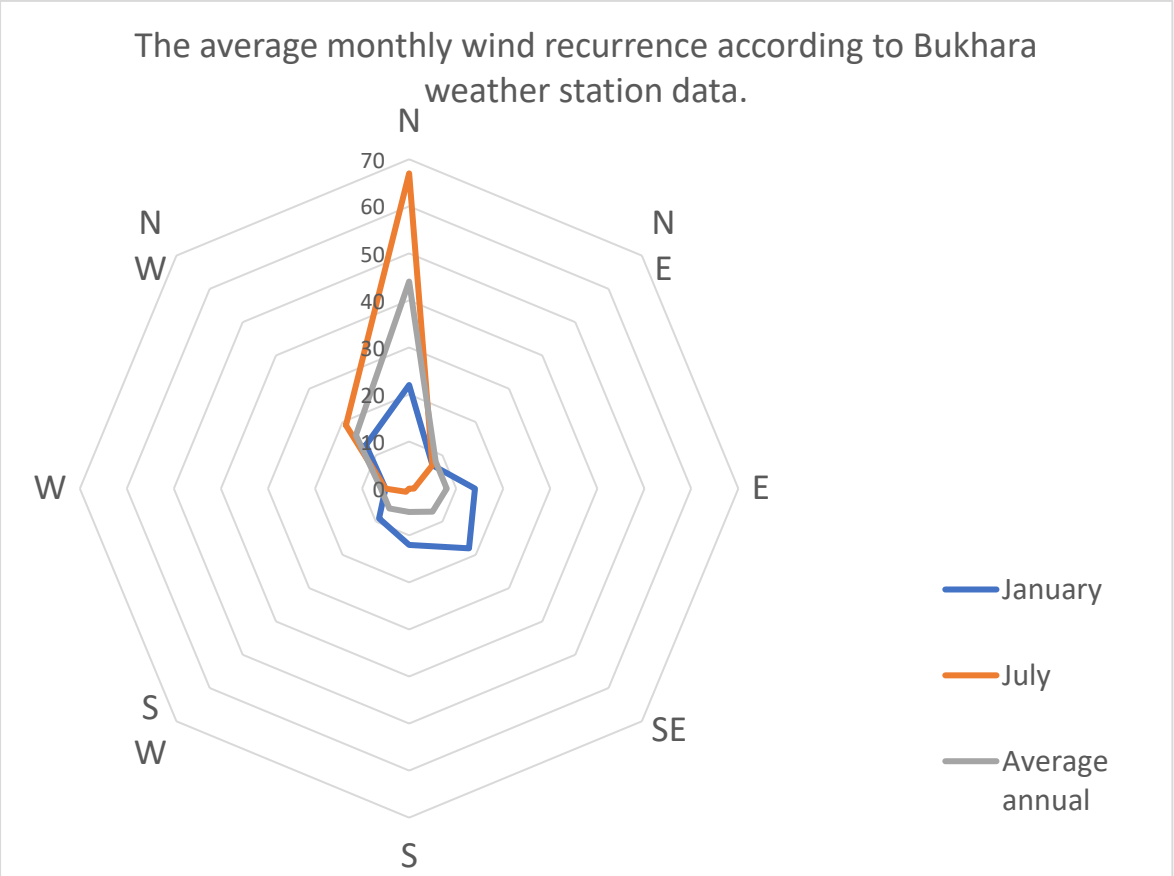


Figure 6.1. Graphic of average monthly wind recurrence according to Bukhara weather station data

Table 6.3. Average monthly and annual air temperature, degrees Celsius.

Weather station	January	February	March	April	May	June	July	August	September	October	November	December	For the year
Kagan	-0.4	2.7	8.4	16.5	22.3	26.7	28,4	25.7	20.1	13.1	6.7	2,3	14,4

Table 6.4. Monthly average absolute and relative humidity levels

Weather station	Sea level. m	By month												
		1	2	3	4	5	6	7	8	9	10	11	12	year
The absolute humidity of the air, mb														
Kagan	222	4.7	5.3	7.1	9.5	9.7	10.8	12.0	10.8	8.1	6.7	5.5	5.1	7.9
Relative humidity at 13 hours %														
Kagan	222	64	59	48	38	24	20	20	20	20	28	40	62	37

Table 6.5. Climate Table

No.	Name of characteristics	Units. rev.	Qty
	1.Air temperature		
1.	The average monthly air temperature in January	°C.	-0.4
2.	The average monthly temperature in July	- * -	24.8
3.	Average annual air temperature	- * -	14,4
4.	Absolute maximum	- * -	48.1
5.	Absolute minimum	- * -	- 22.9
	2. Wind mode		
6.	Maximum wind speed	m / s	
7.	Annual wind speed	- * -	4.3
	3. Atmospheric pressure		
8.	Maximum humidity (July)	mb	12.0
9.	Minimum Humidity (January)	- * -	4.7
10.	The average annual humidity	- * -	7.9
11.	The maximum rainfall in the autumn		
12.	Spring period (X1 - 111)	mm.	125.0
13.	The average annual amount of liquid precipitation	- * -	61.0
14.	Solid precipitation	- * -	40,0
15.	Mixed precipitation	- * -	4.0
16.	Average annual rainfall	- * -	
17.	The average annual duration of precipitation	hour.	
	4. Frosts		
18.	Maximum snow cover	mm	44
19.	Middle c soft cover	-	12
20.	C Independent user date of the first frost	date	10/08
21.	The average date of the last freeze	- * -	04/06
22	Frost-free period	days	184
23.	Depth of freezing soil - soil	m	0.7
24.	The largest number of icing days All types per year	days	19

No.	Name of characteristics	Units. rev.	Qty
	5. Cloud cover		
25.	The average annual number of cloudy days	- * -	119.2
26.	Total cloud cover	- * -	100.5
27.	Lower cloud cover	- * -	18.7
	6. Fogs, thunderstorms, dust storms, blizzards, hail		
28.	The average number of days with fog per year	- * -	32
29.	With thunderstorm for a year	- * -	15
30.	With a dust storm for a year	- * -	5
31.	With snowstorm for the year	- * -	0.2
	With hail for the year	- * -	1

a) Precipitation

In winter, precipitation is most often in the form of drizzling rain, sometimes there are snowfalls, but no stable snow cover is formed. Snow remains for no more than 15 days. In spring, precipitation is mainly in the form of brief showers. In summer, the weather is hot, dry and there is little to no precipitation. Autumn is warm, overcast and rainy in the second half. Almost 60% of precipitation falls in January - April.

The average annual rainfall in the Bukhara Region is low - 125 mm, in the city of Kagan - 222 m above sea level (Table 6.6). The duration of fogs, usually in winter, is 64 hours per year. Average annual evaporation reaches values of 250 mm, higher than annual amount of precipitation.

In general, the territory of the Bukhara Region belongs to the arid zone. The precipitation is brought mainly by wet air masses. The distribution of atmospheric precipitation in the region is uneven and closely connected with the altitude of the area above sea level. Usually, a considerable amount of precipitation falls in autumn-winter and spring periods.

Table 6.6. Average monthly and annual precipitation according to the Kagan weather station, mm

Weather station	Sea level m	By month (mm)													By season % annual amount			
		1	2	3	4	5	6	7	8	9	10	11	12	year	IX - XI	XII - II	III - V	VI - VIII
Kagan	222	20	18	25	20	9	2	0	0	0	3	10	18	125	10	45	43	2

b) Humidity and Pressure

Air humidity in the Bukhara Region depends on the season, precipitation, ambient temperature, air pressure and other factors.

The average monthly humidity in the Bukhara Region in January is 77% and the atmospheric pressure is 747 mm Hg; in March, humidity is 62%, and atmospheric pressure 744 mmHg. In June, humidity is 28%, air pressure is 740 mmHg, 35% humidity in September and, air pressure 736 mmHg, in December 71%, air pressure 748 mmHg. Average annual atmospheric pressure in the Bukhara Region is 742 mmHg, and air humidity is 51%. See Figure 6.2 for details.

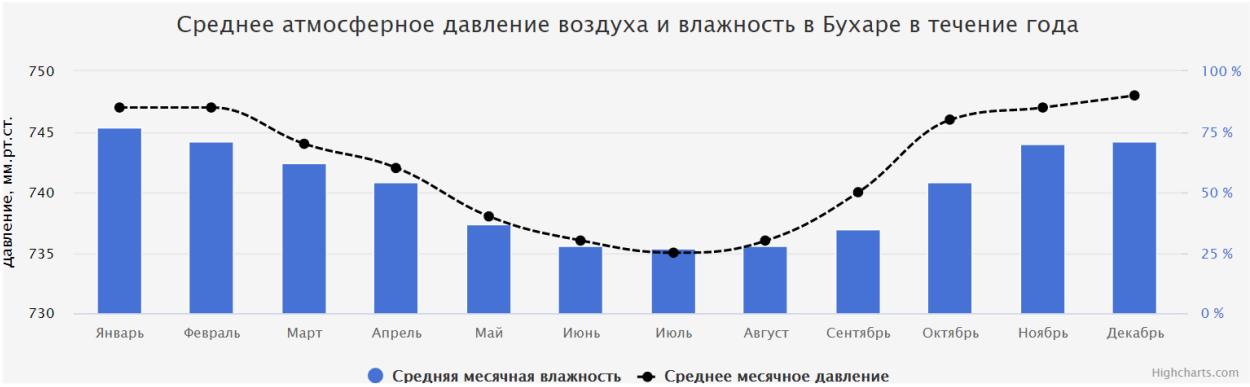


Figure 6.2. Humidity and Atmospheric Pressure in the Bukhara Region (Source: https://global-weather.ru/archive/buxara_buxarskaya_oblast)

The effect of high or low precipitation, especially in the form of rainfall and snow-melt run-off has the potential to impact on the pumping stations and treatment plant in terms of under-supply of water available for sewage network and pumping as well as for treatment plant processes. When water is high, it can mean an interruption (slow-down) in treatment or a by-pass requirement for sewage and wastewater away from the treatment plant, to control water input to produce effective sewage treatment in the WWTP.

Precipitation, winds and atmospheric conditions, including humidity, may affect treatment ponds and negatively impact on sludge treatment and odour issues. These should be measured, as part of pre-project and operation parameters.

6.1.1 Climate Change

Recognising the importance of climate change issues and adopting adaptation and mitigation measures, Uzbekistan signed the UN Framework Convention on Climate Change (UNFCCC) in 1993 and the Kyoto Protocol in November 1998, which was ratified on August 20, 1999. Uzbekistan also signed and ratified the Paris Agreement in April 2017 and November 2018, respectively. Thus, the country undertook institutional, qualitative and quantitative commitments on its implementation, presenting the National Defined Contributions (NDC) - to reduce specific greenhouse gas emissions per unit of GDP by 10% by 2030 from the 2010 level. This commitment to climate change adaptation and mitigation measures has accelerated in recent years. For example, '*Uzbekistan's revised National Determined Contributions (NDCs), submitted in October 2021, target reducing CO_2 emissions per unit of GDP by 35% below 2010 levels by 2030*'. In addition, in 2022 Uzbekistan became one of 150 countries that took the Global Methane Pledge and committed to reduce methane emissions by 30% by 2030. Uzbekistan does not yet have a sector or GHG-specific emissions reduction target, although the country has made progress in the renewable energy program in the power sector.

The level of commitment to implementation of reducing the effects of climate change is also reflected in the institutional reform and re-naming of the Environmental Ministry authority to the officially named "Ministry of Environmental and Climate Change". The signing and ratification of the Paris Agreement requires a country to take actions aimed at reducing greenhouse gas (GHG) emissions and adapting sectors of the economy and population to the adverse impacts of climate change. The stricter national GHG emission targets for Uzbekistan introduced in 2021 demonstrate the government's commitment to dealing with GHG emissions, e.g., methane, and to meeting its international obligations.

Urban centres account for 37% of national carbon emissions in Uzbekistan. Urban emissions will continue to rise along with urbanization rates unless mitigation actions are taken. Emission reduction in cities makes them more liveable and supports climate and urban resilience. Figure 6.3 illustrates total

CO_2 emissions by settlement type in Uzbekistan from 1970-2015, i.e., concentrations are within urban centres.

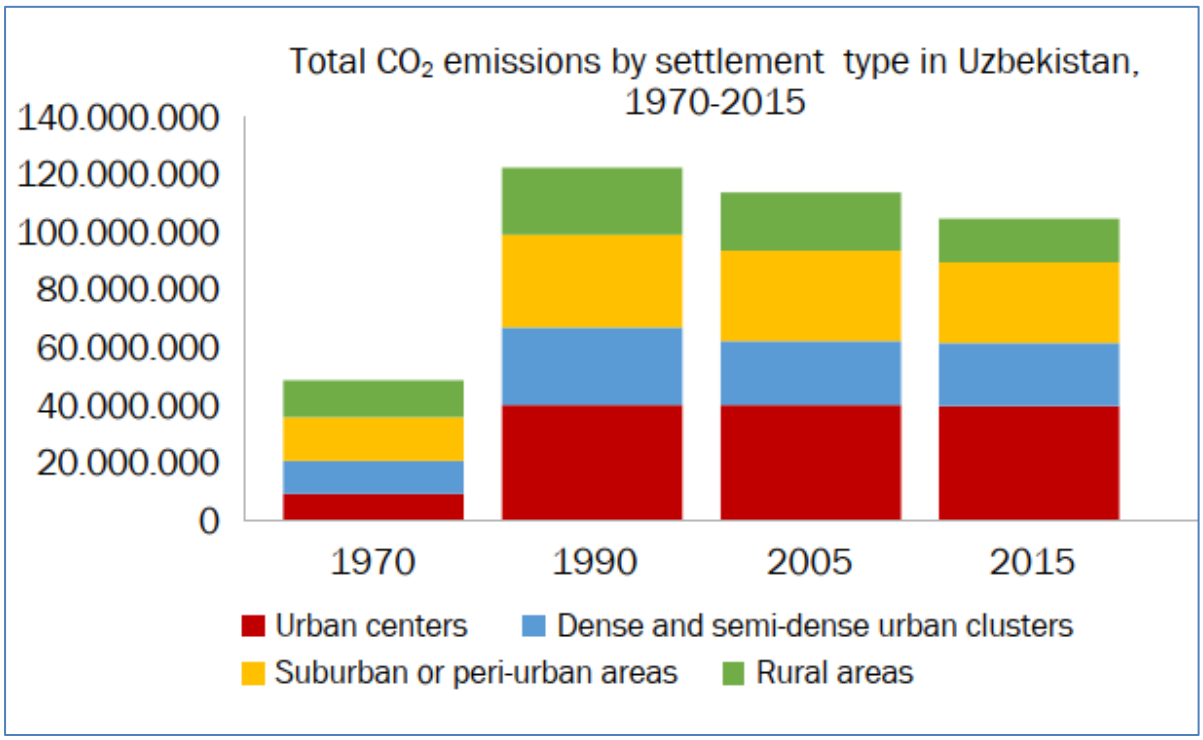


Figure 6.3. Total CO_2 Emissions by Settlement Type in Uzbekistan, 1970-2015[11]

Uzbekistan has a number of interrelated environmental and economic challenges and needs, including inefficient use of natural resources, negative impact of climate change, waste management, and degradation of environmental systems. The most pressing challenges include the following: limited natural resources (natural gas and coal reserves will be sufficient only for the next 20-30 years, oil reserves are already virtually depleted; there is a growing shortage of water and degradation of land resources); accelerated industrialization and population growth will significantly increase the economy's need for resources, exacerbating negative anthropogenic impacts on landscapes, threats to biodiversity and increasing GHG emissions. The energy intensity of the economy of Uzbekistan is three times higher than the world average, and the level of GHG emissions remains one of the highest in Central Asia (Source: World Bank Group Report, 2023).

The trend of reducing biological diversity, land degradation, salinization of soils, violation of the hydrological regime of rivers, desertification of significant territories continues. Special attention is paid to the consequences of the Aral Sea catastrophe.

The "Strategy of the Republic of Uzbekistan on transition to "green economy" has been developed (approved by the Decree of the President of the Republic of Uzbekistan #4477 from 04/10/2019) for the sustainable development of the economy and a reduction of GHG emissions in Uzbekistan. The Strategy provides for a significant increase in the share of energy from renewable sources in the energy balance by 2030, to increase their share in the structure of generating capacity to 19.7% by 2025, double the indicator of energy efficiency improvement by 2030, halve the carbon intensity, and ensure universal access to affordable, reliable and modern energy supply. The Strategy also aims to

[11] Monica Crippa et al 2021, cited in World Bank Group report 2023, page 21.

substantially increase water use efficiency in all sectors of the economy and ensure overall access to safe drinking water.

a) Key aspects of climate change adaption in Uzbekistan

According to a World Bank Group (2023) publication[12], '*with rising temperatures, reduced precipitation, and retreating glaciers, Uzbekistan is projected to be among the most water-stressed countries in the world'.* As such, climate risks are intertwined with water security, food security and land degradation.

The increase in average annual air temperatures in Uzbekistan occurs against the background of high natural variability, which causes significant inter-annual fluctuations. The rates of warming are higher than the average rates observed on a global scale. On average in Uzbekistan the warming rate is 0.27^{o}C for 10 years and average temperatures have increased by 2.9^{o}C from 1950 to 2020.

There is an increase in the number of significant positive temperature anomalies throughout Uzbekistan and in all seasons of the year. With the overall warming of the climate in the future, the probability of intense "heat waves" increases and the probability of cold waves persists.

In the next 40-50 years, warming in the region will result in a slight decrease in vegetative runoff. In the long-term it is possible that there will be a reduction of runoff of some rivers in the Amudarya river basin by 7-22%, and in the Syrdarya river basin - by 4-5%. Minimal changes are expected for large rivers, while larger changes are expected for small rivers in the foothill zone, although the Amudarya is impacted by the water needs and operations of several countries, namely, Uzbekistan, Turkmenistan and Kazakhstan (impacting also the Decertified Aral Sea and water uses such as power generation, irrigation and drinking water availability), and Tajikistan (source of water through the Pyanj River) and Afghanistan (currently constructing a large canal from the river to open up irrigation command areas, putting pressure on water availability on other nations). It is estimated that by 2021-2040, the average moisture deficit in Uzbekistan is expected to increase by 11-14%.

b) Climate Change in Bukhara Region

According to the World Bank Group's Country Report for Uzbekistan[13] (2023), a large share of the population in both rural and urban areas will live in areas of very high climate risk – more than one-fifth of the projected population of Uzbekistan in 2030 (8 million). The highest population concentrations of risk reside in the Ferghana Valley, Khorezm, Bukhara, and Surkhandarya regions, as illustrated in Figure 6.4 and Figure 6.5.

[12] World Bank Group, Uzbekistan Country Climate and Development Report, November 2023 – page 18.

[13] World Bank Group, Uzbekistan Country Climate and Development Report, November 2023 – page 14.

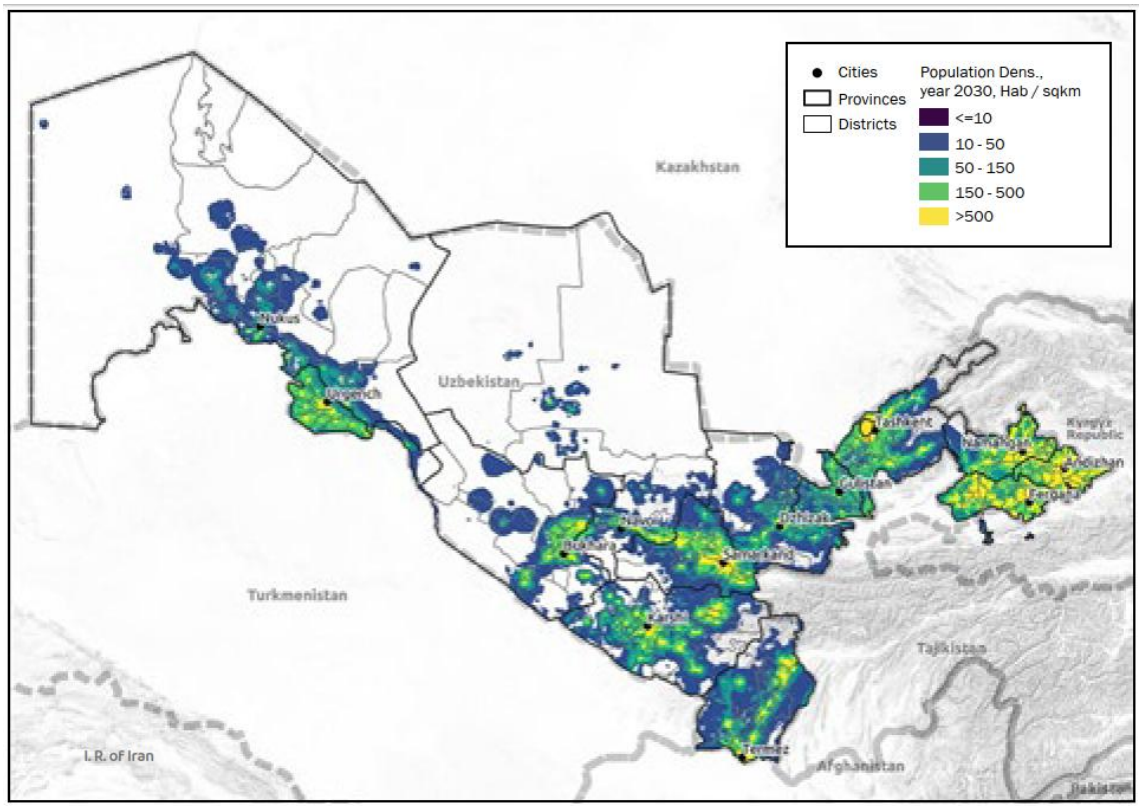


Figure 6.4. Population Density in Uzbekistan (2030)

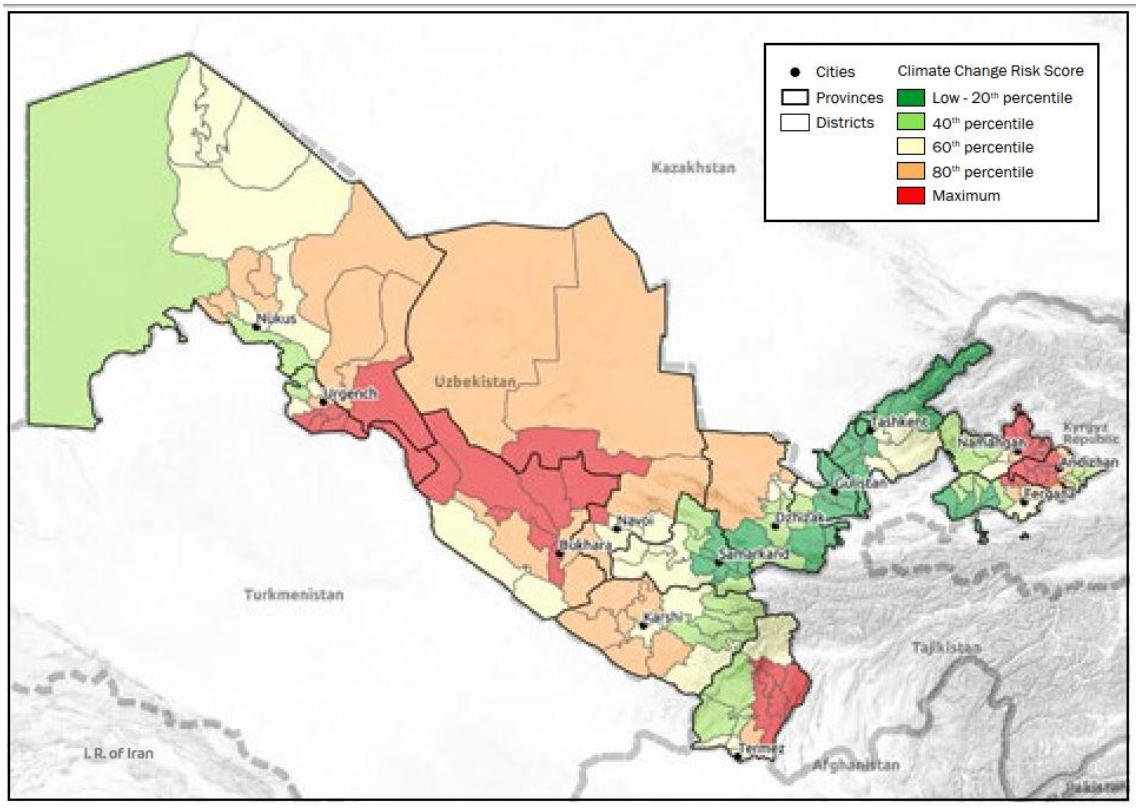


Figure 6.5. Climate Risks – Bukhara Region (2030)

The water resources management system of the Bukhara Region annually faces problems in managing water allocation between users caused by climatic conditions each year. Dry years are the most difficult to manage due to lack of or low precipitation and high temperatures in the autumn-winter period. Water inflow into reservoirs in such years is minimal, with small rivers practically drying out in summer. Water availability falls to 60-65%.

Heavy precipitation in spring is often accompanied by a dry winter, which practically puts water resources management in a difficult situation. On the one hand, reservoirs are not sufficiently filled, as they are formed due to melt water, and on the other hand, mudflow during the spring period affects water consumption, as the water is not retained by reservoirs due to high consumption/extraction from small rivers and in the upper reaches of the rivers forming reservoirs. In most cases, such debris flows have to be discharged to avoid the destruction of riverbeds and canals. Therefore, there is a need to consider the impact of low water supply in the sewage pipe network scheme especially gravity feed piping, network of pumps and water levels required for the sewage treatment plant operations, collector canal. Low water availability also affects construction in terms of water for concrete production, for road materials and dust suppression.

c) Drought

Due to possible reduction of vegetative flow and increase in water consumption in the sectors of the economy as a result of climate change and intensive population growth, the risks of extreme dryness and drought are significantly increasing, especially in the lower reaches of the Amudarya basin rivers. This includes the Bukhara project areas.

d) Heat waves

An increase in the number of days with "heat waves" will be observed in the Bukhara Region. An indicator of the risk of dangerous "heat waves" is the number of days with high air temperature.

Due to the expected increase in the overall variability of precipitation and its daily maximum, an increase in frequency of heavy precipitation, rainfall and hail can also be expected.

e) Mudflow and floods

Mudflow is widespread in mountainous and foothill areas of Uzbekistan and can be a cause of flooding.

In the Bukhara Region there are dams of reservoirs, although these are relatively low. However, the possibility of a rupture cannot be excluded. Therefore, all hydraulic structures, regardless of their parameters and functional purpose, are subject to the Law of the Republic of Uzbekistan "On safety of hydraulic structures" (1999), and are also subject to periodic inspection, both in terms of their safety and in terms of their ability to perform their functions (technical reliability). The main tasks of ensuring the safety of hydraulic structures must be carried out by their operating organizations.

f) Impact of climate change

- **Impact of climate change on public health in the region:** Climate change affects human health through a complex system of factors. The direct consequences are loss of life and injuries as a result of mudflows, floods, and heat waves, the frequency of which has been noted to be increasing. Indirect effects are manifested in the increased incidence of infectious, vector-borne diseases and lack of clean drinking water.
- **Impact of climate change increased intensity of rainfall:** Excess rainfall and water runoff will impact on the WWTP causing stress on treatment operations; and/or a need for wastewater bypass operation.
- **Impact of climate change on biodiversity:** Climate change is intensifying land degradation and desertification and thus affecting biodiversity. These processes are particularly active in a number of districts of the region, in the Kyzylkum desert and in the foothill areas. Such trends in the future will intensify the transformation and fragmentation of desert, foothill and lowland ecosystems.

Climatic factors affect the functioning of aquatic and terrestrial ecosystems through changes in surface runoff, which, depending on the water availability in a given year, undergoes significant fluctuations. When flood regimes change and water flows in rivers decrease, riparian vegetation areas decrease, and floodplain river ecosystems further degrade.

g) Measures for adaptation to climate change

Climate change will affect the Bukhara Region and Ramitan area resulting in an increase in the water deficit. Necessary adaptation measures include:

- more efficient use of available water resources;
- widespread introduction of water-saving technologies in agriculture, industry and the public utilities sector;
- improvement of irrigation infrastructure in order to reduce water losses and its cost per unit of production;
- transition to the use of highly saline irrigation water; and
- increase of mechanization and automation of water distribution in river basins and irrigation areas.

Drought forecasting, development of early warning systems and drought preparedness is the main strategy for adaptation to climate change.

Adaptation measures to reduce risks and negative impacts of weather hazards include:

- development and improvement of monitoring and warning systems;
- strengthening rapid response;
- protection capacities;
- adaptation measures to climate change in the health sector;
- stricter control of drinking water and food quality during hot periods;
- raising awareness of the population - especially the most vulnerable groups (children, women, elderly people) about the impact of climate change on health.

To stabilize the environmental situation, reduce negative environmental and social impacts of climate change, and conserve biodiversity, it is necessary to:

- improve water resources management;
- ensure strict compliance with sanitary and environmental standards;
- develop an environmental monitoring system for watercourse ecosystems;
- integrate management of water ecosystems, restoration of fishing potential and main components of ecosystem biodiversity.

6.2 Land Cover

6.2.1 Desertification

As reported by the United Nations Convention to Combat Desertification (2023)[14], Uzbekistan was reported as having the highest proportion of degraded land in the Central Asia region, although it also had the largest decrease (from 30% to 26%) compared to 2015.

The two main rivers of the region, Amu Darya and Syr Darya, flow through the country and terminate in the Aral Sea. Three million hectares of land in Uzbekistan were degraded due to the drying of the Aral

[14] United Nations Convention to Combat Desertification. 2023 Press Release. *Over one-fifth of Central Asia's land degraded, new UN data warns*.

Sea. Land degradation is caused by geological, geo-morphological and anthropogenic pressures. The lands of Bukhara and other regions also suffer from soil degradation.

Desertification in Uzbekistan is due to the varied characteristics of the natural conditions of the territory and the nature of the use of natural resources in Uzbekistan. Aspects contributing to desertification include the dehumification of arable land both in the steppe zone and in the zone of irrigated agriculture, water and wind erosion, pasture degradation, salinization of irrigated lands, degradation of vegetation and reduction of forests, drying out of lakes and deltas of desert rivers, pollution of soils with chemical compounds and oil pollution of ecosystems.

6.2.2 Land Use in the Ramitan Project Area

Figure 6.6 illustrates land use within the Ramitan Project site boundary and demonstrates the location of potential sensitive receptors. Land use in the proposed pipeline network area is dominated by urban settlement with a small portion of land used for industry and agriculture. The proposed pipeline network will run within the existing road network in the town of Ramitan.

The area around the boundary of the Project area is mainly agricultural and urban residential. The proposed WWTP is located within an agricultural area much of which is covered by greenhouses or structures for the cultivation of plants. There are two industrial areas located within the project boundary, one to the East of the project boundary and one to the West with a section of the industrial area within the project boundary.

The WWTP site is planned to be placed on a vacant land parcel, where there are no tree and shrub plantations. The nearest residential buildings are located at a distance of approximately 550m to the west of the WWTP, and a housing development is also located *ca*. 650m east from the planned Ramitan WWTP.

According to the Ramitan SDDR, "*Permanent land acquisition is needed only for the sewage pump stations (normally not more than 0,025 ha sites), including MPS (0.21 ha site), and for the WWTP (4.54 ha site) to be developed at the sites allocated from the vacant and contingency land category. The issues of land allocation have been resolved at the level of the Cabinet of Ministers of the Republic of Uzbekistan and the Bukhara Region Hokimiyat. Land plots for SPSs and WWTP have been transferred to the balance of Bukhara Suv Ta'minoti JSC".*

The feeding pressure main and the discharge gravity sewer are routed across the lands of the Tukhtamurod Private Farm. As included in the SDDR, '*Pressure pipeline to the WWTP and discharge pipeline to the drainage canal is routed through the land of a corn-growing farm. Bukhara Suv Ta'minoti JSC, as a temporary user of the land, entered into agreement with the farm. The agreement establishes an easement on the land plot allocated for the pressure main and the discharge pipeline, and the right of the "Temporary Land User" to limited use of the land plot'.*

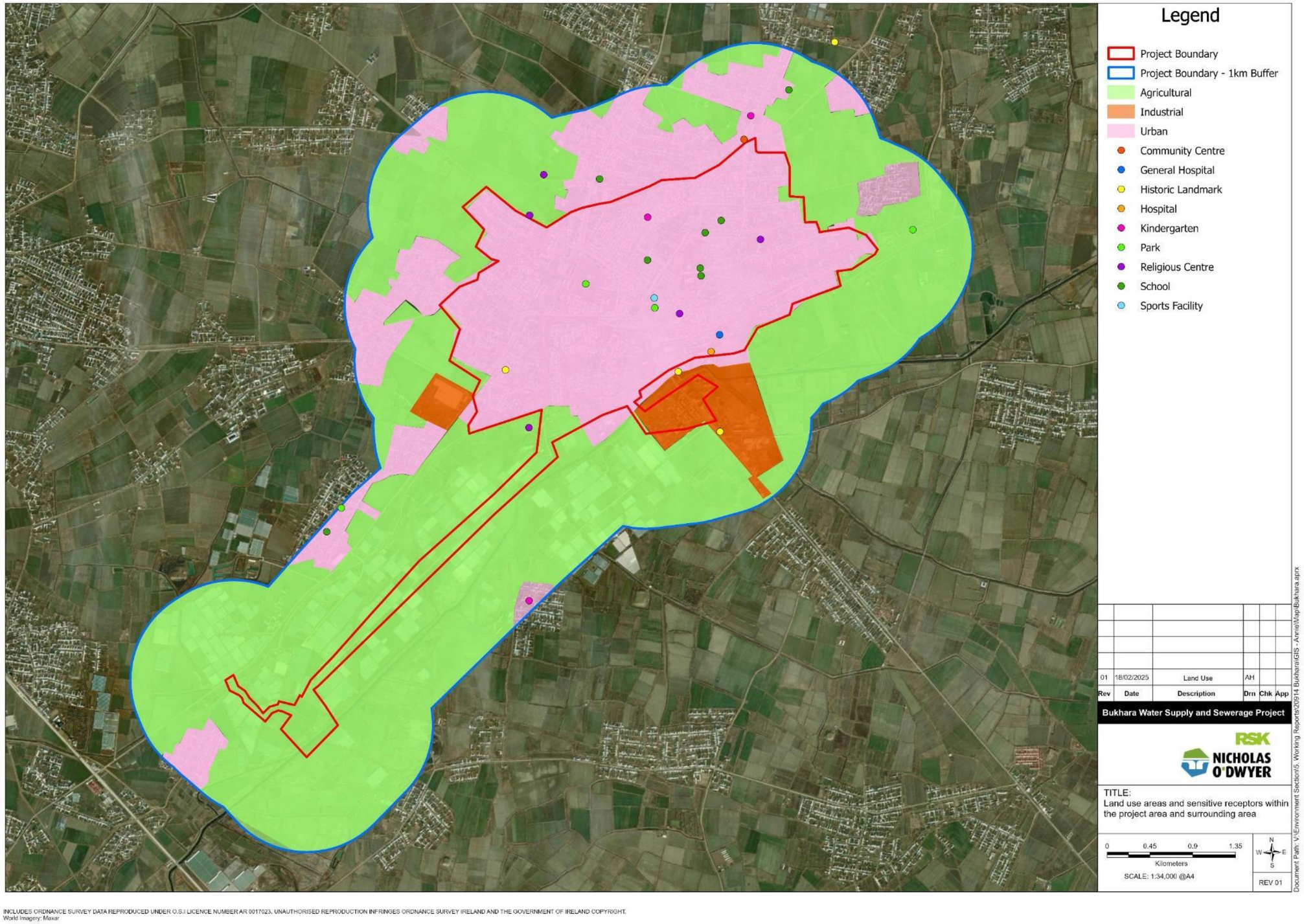


Figure 6.6. Land Use including sensitive receptors within the Ramitan Project Boundary

6.3 Soil and Geology

6.3.1 Soil

Various types of transitional hydromorphic soils are distinguished within the limits of the Bukhara Region (Figure 6.7). Various types of soils are common due to relief heterogeneity, composition of surface sediments and groundwater characteristics within the Bukhara Region.

The Geotechnical Survey identifies four engineering-geological elements (EGE) have been identified within the 10m thickness of soils in the survey area (area surrounding the sewer network): EGE-1 Loams and sandy loams (above GWL); EGE-2 Sandy loams and loams (below GWL); EGE-3 Sands; and EGE-4 Gravelly cobbles. Soils of the study area (surveyed to a depth of 10.0m) consist of alluvial modern Quaternary deposits of the Amudarya complex and are assessed as slightly saline. At the WWTP site, soils are EFE-1 Sandy loams (above GWL); EGE-2 Sandy loams (below GWL); and EGE-3 Sands.

Meadow and meadow-alluvial soils are found in the inner oasis areas of the Bukhara district. Due to the influence of irrigation and cultivation procedures the soils have turned into cultivated Meadow-Oasis soils. Meadow-Oasis Soils develop under the influence of shallow groundwater (1-3 m), irrigation regime of nutrition, which determine saline processes in soils and depend on the conditions of groundwater recharge and outflow, and the degree of their mineralisation. In this respect, the soils developed in the upper part of the delta are in more favourable condition than those developed in the rest of the delta.

Desert Sandy Soils are found in non-irrigated areas. Due to the loose structure of the sands and their exposure to wind and aeolian processes, the substrate is stripped and renewed often causing these soils to be shallow and young. Desert Sandy possess a humus content of about 0.5% and nitrogen levels between 0.04% and 0.05%. Due to their low nutrient content, these soils often lack vegetation, making them susceptible to degradation and wind erosion.

Grey Brown Soils are found in the northern and eastern parts of the region. These soils have textures ranging from sandy-loamy to medium-loamy. The humus content varies between 0.6% and 0.9% in the arable layer, with older irrigated lands showing higher humus levels of 1.2% to 1.8%. Nitrogen content ranges from 0.05% to 0.16%, and phosphorus from 0.09% to 0.11%.

Takyr soils are less common but are found on the outskirts of the oasis. The characteristics of the soils of the district are shown in Figure 6.7.

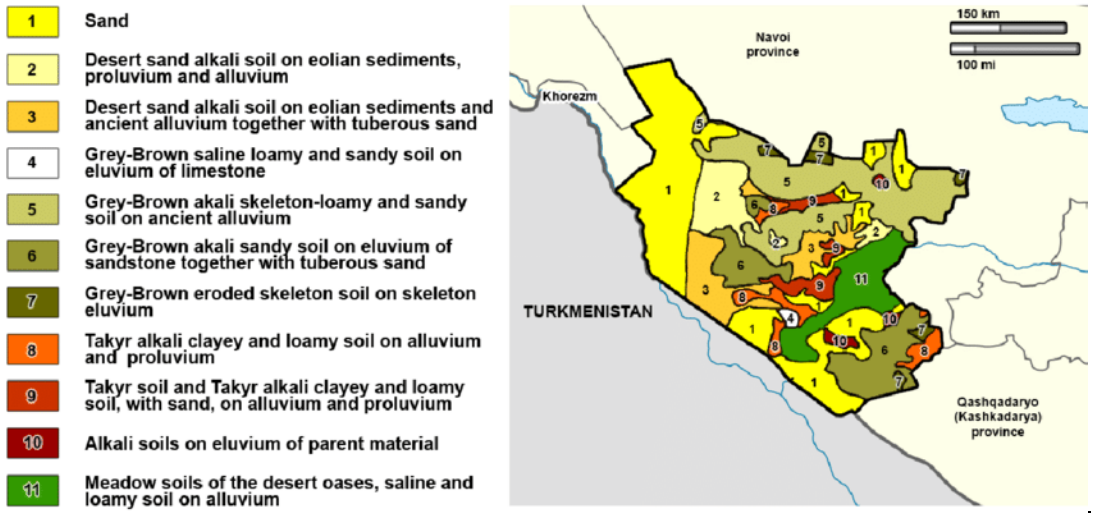


Figure 6.7. Soils of the Bukhara Region[15]

[15] M. Groll et.al. (2015) The Modern Problems of Sustainable Use and Management of Irrigated Lands on the Example of the Bukhara Region (Uzbekistan)

6.3.2 Geology

The Bukhara Region belongs to the Bukhara-Khiva Fault located within the northeast side of the Amudarya syneclise. In Hercynian, and possibly in before Hercynian time, a series of steamship faults - the Predkyzylkum, Bukhara, and Amudarya faults - occurred here, which dissected the territory from the south-east to the north-west, causing a stepped structure of the consolidated foundation. From the north, the region is bounded by the Predkyzylkum Fault, which separates it from the Kyzylkum Rift Zone, and from the south by the Amudarya Steamy Rift, which separates it from the Bagadjinskiy Stages. Within the territory of the Bukhara-Khiva Fault, the Bukhara and Chardjou stages, separated by the Bukhara Steam Fault (or Uchbash Karshi Flexural Bursting Zone) are distinguished.

Seismicity

The Bukhara Region is in a seismic hazard zone. Severe earthquakes of more than 5 magnitude in Uzbekistan occur approximately once or twice within 2-3 years. The seismicity of the region is 7-8 points. See Figure 6.8 for a seismic map of the area.

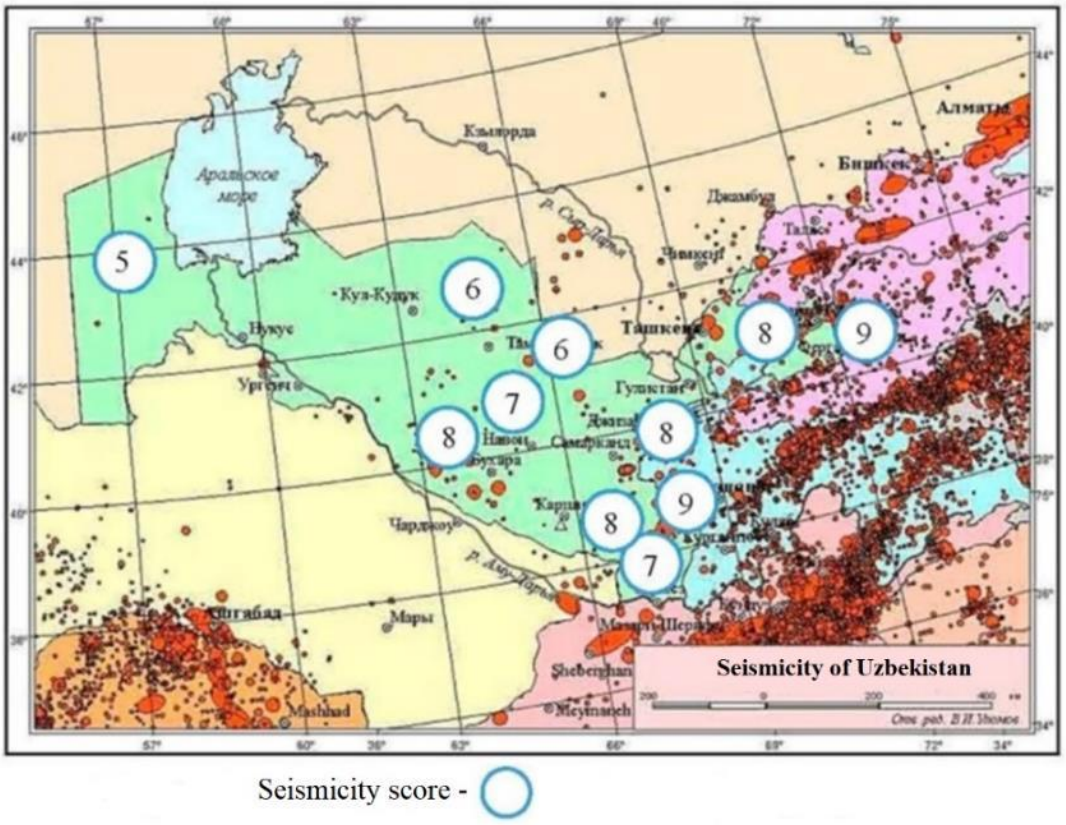


Figure 6.8. Seismicity of the Area

The Bukhara-Khiva Region is recognised for its oil and gas reserves. The Bukhara step extends from the northwest to southeast[16]. On most of the Bukhara step, salt and reefs are absent, and hydrocarbon accumulations are in structural traps in reservoirs varying in age from Middle Jurassic to Late Cretaceous[17]. Exploration activities have identified multiple productive horizons, particularly within

[16] N Mukhutdinov et al 2021 IOP Conf. Ser.: Earth Environ. Sci. 937 042085

[17] G.F. Ulmisheket 2004: U.S. Geological Survey Bulletin 2201–H.

Jurassic and Cretaceous sediments. The presence of hydrocarbons is associated with specific lithofacies and structural conditions that have facilitated the entrapment of oil and gas.

6.3.2.1 Stratigraphy

The district's subsurface geology comprises a thick sequence of sedimentary rocks, including sandstones, siltstones, shales, and carbonates, primarily from the Mesozoic and Cenozoic eras. The Palaeozoic rock base is overlain by Mesozoic and Cenozoic deposits.

The Geotechnical Survey carried out for the Project in 2024[18] was carried out by department specialists and leading geologist Jumaev A. A. During the survey, it was identified that the base rock appears on the surface only in the core areas of the Young Kyzylkum uplifts, north of the Gazli epicentral zone, and eastern from the latter, on the uplifts of the western spurs of the Turkestan and Zeravshan system of the Southern Tien Shan.

The Mesozoic-Cenozoic sedimentary mantle on most of the Turan plate begins with Jurassic deposits, and in the deepest depressions Triassic and Permian-Triassic rocks are found. However, in many places, various Cretaceous, Paleogene and Neogene rocks lie directly on the base. Jurassic deposits are penetrated only by deep boreholes and are represented by limestones, clays, sandstones and conglomerates. The thickness is 150 m. Cretaceous deposits are represented by alternating layers of sandstones, clays with streaks of siltstones and limestones. The total thickness of the Cretaceous deposits varies from 400 to 1200 m. Paleogene and Neogene deposits are most widespread in the area and are represented by Paleogene marine formations and Neogene continental deposits. The undifferentiated sequence of Paleogene-Neogene deposits is entirely covered by a thin mantle of the modern Quaternary deposits. The latter are represented by grey, fine-grained, silty aeolian sands. Paleogene-Neogene deposits are represented by a sequence of alternating sandstones, siltstones and clays

6.3.2.2 Geomorphology

The local terrain develops due to tectonic movements and erosion and deposition processes.

Erosion processes are associated with the activity of the Zeravshan River. The Upper Quaternary alluvial plain is located in the western, northern, and southern parts of the area and was formed by the Zeravshan in the late Quaternary. The Modern alluvial-delta plain is occupied by alluvial-delta lowlands composed of deposits of the second floodplain terrace of the Zeravshan River in the north, south and west. The plain is dissected by a network of canals, areas have also been artificially levelled for irrigated agriculture. The Zeravshan River valley is 20-30 m in width crosses the area from the north-east to the south-west. The river is meandering in its entire length which create oxbow lakes which fill during high water periods.

Deposition processes in the study area are mainly associated with Aeolian processes. Aeolian sands are sub-divided into hummocky and barkhan. The hummocky sands are spread in the northern and eastern parts of the area and are usually fixed by vegetation. The barkhan sands are distributed mainly in the northern and eastern parts of the area. Barkhan sands are arch-shaped sand formations with a gentle northern slope and steep southern slope. The formation of these sand structures is still ongoing.

Tectonic movements have influenced the geomorphology of the local terrain. The Kagan, Ispani-Chandyr and Azkamar uplifts separated by the Jamanmai, Kushab, Chaydaroz and Ramitan troughs. were shaped by tectonic movements of the Hercynian and Alpine stages.

[18] Prof Art Technology. 2024. Technical Report. Geotechnical Survey for the Project 'Development and modernisation of the sewerage system in Gizhduvan, Ramita, Karakul, Alat and Karaulbazar district centres of Bukhara region (1st priority). Component 2: Sewerage. Sewage Pump Stations (SPS), Sewer Networks and Wastewater Treatment Plant (WWTP) in Ramitan district centre.

6.4 Water

Water resources of the Bukhara Region consist of surface and ground waters, as well as return water from anthropogenic use (sewage and drainage water). Water resources are mainly generated in transboundary river basins. The Ramitan Project area is located in the Zarafshon River Basin, which is one of the important surface water sources for Uzbekistan and its neighbours.

6.4.1 Surface water

Ramitan is located in the Bukhara delta of the Zarafshon River. The entire territory of the Bukhara oasis is crossed by irrigation canals, collectors and small drainage systems. The main collector is the West-Ramitan collector which flows east and northeast of the WWTP site. Flow rate of the collector is 0.07-0.09 m/s.

The central Bukhara collector is the remaining bed of the Zarafshon River, which flows along a total length of 273 km, of which 76.8 km have concrete lining and 196.2 km have earthen beds. The collector flows along an ancient channel in the central Bukhara delta. The water quality of the collectors is affected by agricultural runoff from nearby fields. According to the Main Hydrometeorological Centre, oxygen levels are satisfactory while the nitrates, nitrites, ammonium nitrogen, petroleum products and fluorides, and iron ions are below sanitary standards. The collector and drainage network is regularly maintained to ensure improvement of these conditions. Main issues affecting the collector systems are silting of channels and culverts at channels, littering at banks with garbage and soil dumps from channel clearing activities.

A water quality test was conducted on the Zarafshon River at the Central Bukhara Collector on the 6th of February 2024. Figure 6.11 shows the location of the collector and the outfall location from the proposed Ramitan WWTP. This baseline was required for the purpose of the EIS, from which the Ministry of Ecology, Environmental Protection and Climate Change (MEEPCC) and SEE determined the water quality performance legal standard required

Table 6.7 summarizes the water quality testing results. It should be noted that the Contractor will need to conduct water quality testing prior to commencing construction. Table 6.7 presents the results compared against the relevant fishpond standards. Exceedances are noted for COD (which is related to BOD) and sulphates, most likely due agricultural and domestic wastewater runoff .

Table 6.7. Water quality at Central Bukhara Collector (Zarafshon River), Ramitan

SN	Parameter	Uzbekistan Standard (Fishponds)	Sample Test Result	Status
1	Ambient temperature	Not recorded	+13 - 15°C	N/A
2	pH	6.5 - 8.5	7.5	Normal
3	BOD-5	30 mg/l	11.0 mg/l	Normal
4	COD	15 mg/l	20.0 mg/l	Exceed limit
5	Dry residue	Not recorded	1893.0 mg/l	N/A
6	Total Hardness	190 mg/l	26.5 mg/l	Normal
7	Ammonium Nitrogen	0.5 mg/l	Not detected	Not detected
8	Nitrites	0.08 mg/	Not detected	Not detected
9	Nitrates	40 mg/l	18.8 mg/l	Normal
10	Chlorides	300 mg/l	399.5 mg/l	Exceed Limits
11	Sulphates	100 mg/l	586.0 mg/l	Exceed Limits
12	Petroleum and oil products	0.05 mg/l	Not detected	Not detected

SN	Parameter	Uzbekistan Standard (Fishponds)	Sample Test Result	Status
13	Polyphosphates	0.3 mg/l	Not detected	Not detected

The Zarafshan River is the third longest river in Central Asia and flows through Uzbekistan (781 km long, 12,300 km^2 of catchment area, with an average long-term water flow of 190 m^3/sec). The Zarafshan originates from numerous tributaries of the Turkestan and Zarafshan ridges and flowing from east to west between these two ranges, it is replenished by its remaining tributaries: Fandarya, Magian and Kshtut. Below Penjikent, the river flows in the plain part of Samarkand and then Navoi Region, bounded by the spurs of the Zeravshan and Turkestan ridges, Zirabulak and Ziatda mountains, and Chumkartau, Nuratau, Karatepa and Aktau ridges. The river then turns to the south-west, towards the Bukhara oasis, where it actively disassembles into irrigation canals.

Surface waters of the Bukhara Region also include lakes, namely Tudakul, Dengeskul, Zamonbobo, Shorkul and Aydar as well as the Kuyumazar reservoirs. The main purpose of the Kuyumazar reservoir is irrigation.

The water supply of the Ramitan district centre is sourced from the Zarafshon River and Collector system. The construction of sewage networks and treatment facilities will prevent the discharge of untreated wastewater onto the terrain and into open watercourses, as periodically occurs in the current scenario. The discharge effluent from the Ramitan WWTP will be discharged into the Central Bukhara Collector.

6.4.2 Groundwater

Groundwater in the study area is found in the Upper Quaternary deposits and is recharged by surface water such as the Zarafshon River and irrigation canals and irrigation systems. Groundwater is characterized as non-aggressive to conventional concretes on non-sulphate-resistant cements.

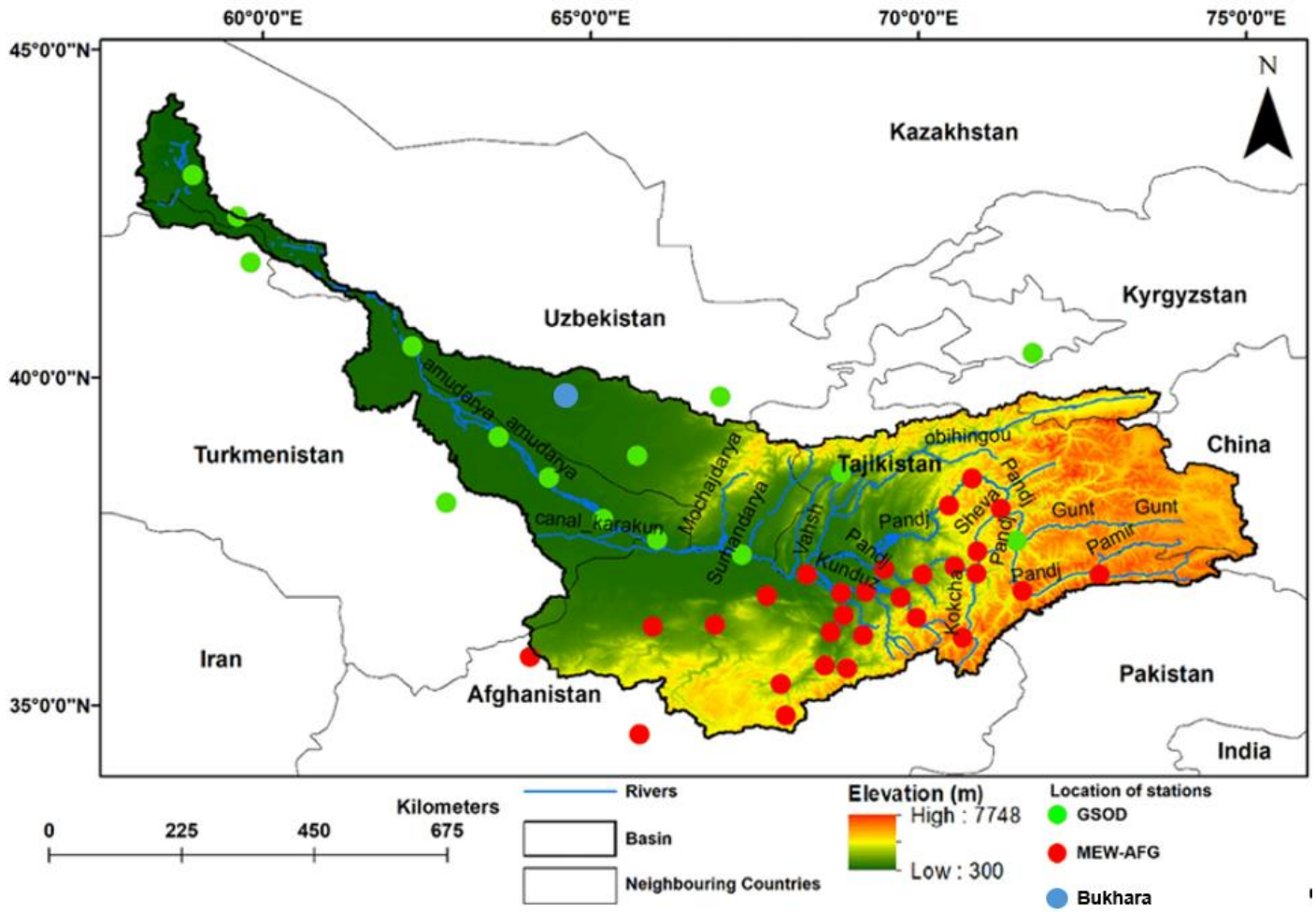
As mentioned in Section 6. 3, the geological structure of the area includes rocks of Mesozoic-Cenozoic age on Paleozoic base. Several aquifers are within the complex of the Mesozoic-Cenzoic deposits. The aquifer occurs at a depth of 10-100m at the point of discharge.

Groundwater levels and solids content were assessed during a study period of March 2023-April 2024. Groundwater was tapped at a depth of 1.2-4.5m from the surface. Mineralization of groundwater is characterized by the solids content ranging from 2530 mg/l to 18068 mg/l, content of SO42- ions from 1008 mg/l to 6817 mg/l, Cl- from 343 mg/l to 4795 mg/l. The Geotechnical Survey (2024) report[19] provides the results of the groundwater chemical analysis conducted at the sewerage pump stations (SPS) sites and at the WWTP site.

Groundwater levels experience seasonal fluctuations with the highest groundwater levels expected in March-April and the lowest in November – December. This depends on the influx of atmospheric and irrigation waters.

Currently, in the absence of a WWTP and sewage network, the untreated sewage liquid fraction seeps into the soil and reaches the groundwater table, contaminating this water resource.

[19] Ibid.



9Figure 6.10. Geographical position of the Amu Darya River basin in Central Asia and the meteorological stations in the basin (Salehie et al., 2022)

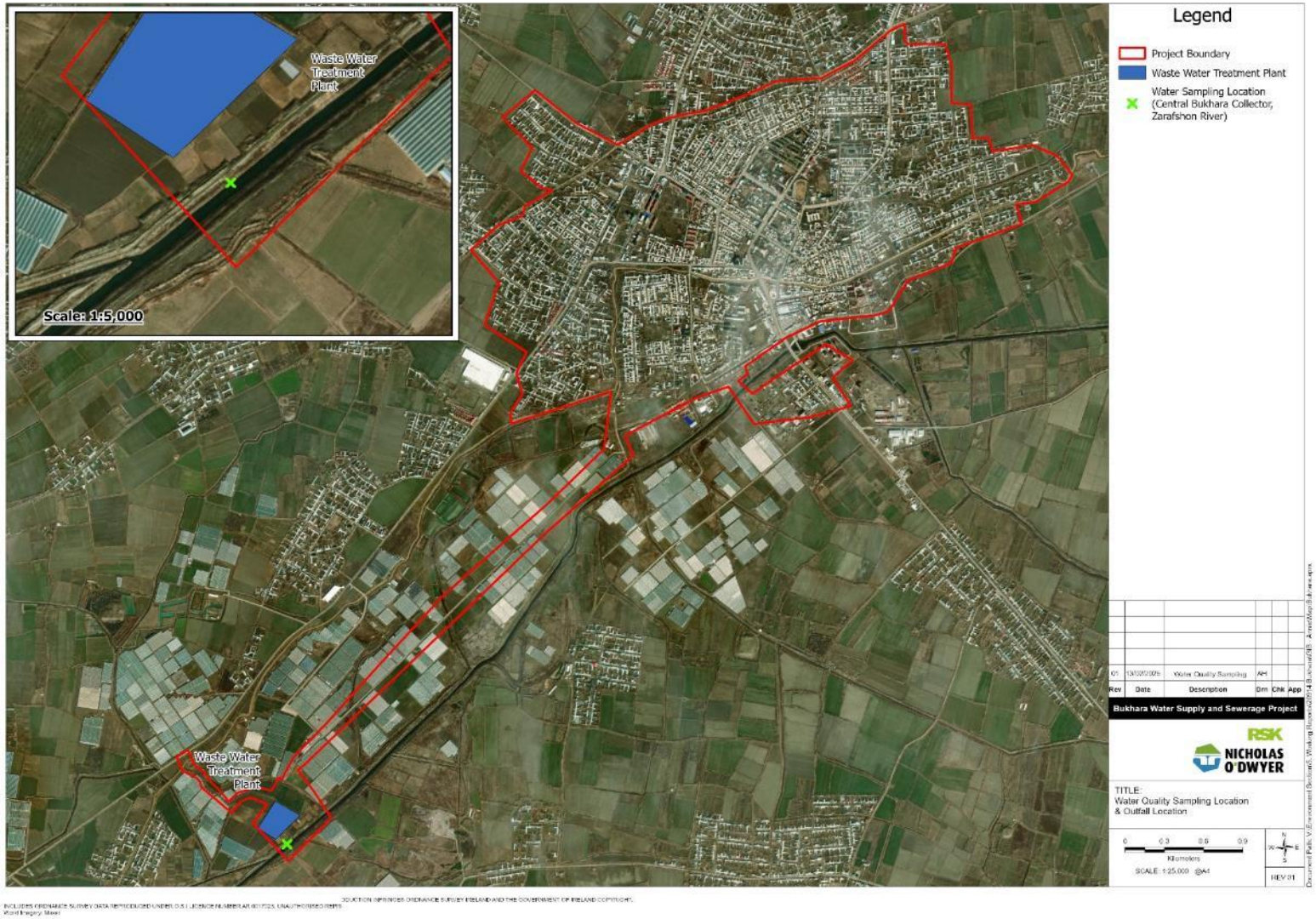


Figure 6.11. Water Quality Sampling Location

6.5 Air Quality

The Law on the Protection of Atmospheric Air establishes the basic principles of the protection and rational use of the atmosphere in the country, economic mechanisms and responsibilities, as well as the directions of activity of state bodies, and Sanitary and Phytosanitary Regulations No. 0293-11. (2011).

Atmospheric air pollution concentrations for 2023 for Bukhara City and Kagan City were provided by the Bukhara Regional Hydrometeorological Centre and average annual results are available in Table 6.8 and are compared against National Standards.

The proximity of the project boundary to the Bukhara City Monitoring Stations (Bukhara City Monitoring Station 1, 2 & 3) is *ca*. 14.8 km south-west and the Kagan City Monitoring Station (Kagan Weather Station) is *ca*. 27.8 km south-west. As seen in Figure 6.1, the average annual wind direction recorded at the Bukhara weather station is from the north. The results indicate that, on average, dust levels in Bukhara exceed the national standard.

The high levels of dust recorded at the national air monitoring stations indicates that these are likely to be from natural sources (i.e., the surrounding desert). The monitoring stations are located in a similar, reference environment to the project environment (i.e., an urban settlement in a desert/arid environment).

Table 6.8. Air Quality Baseline Results Compared Against National Standards

Name of the substances	(mg/m^3)		
	Average Annual Result	**Standard**	**Exceedance of Standard (Yes/No)**
Bukhara City			
Dust	0.1318	0.05	Yes
Sulphur Dioxide	0.0034	0.05	No
Carbon Monoxide	2.0583	3.0	No
Nitrogen Dioxide	0.0358	0.05	No
Nitrogen Oxide	0.0200	0.06	No
Phenol	0.0019	NA	NA
Ammonia	0.0092	NA	NA
Kagan City			
Sulphur Dioxide	0.0034	0.05	No
Nitrogen Dioxide	0.035	0.05	No

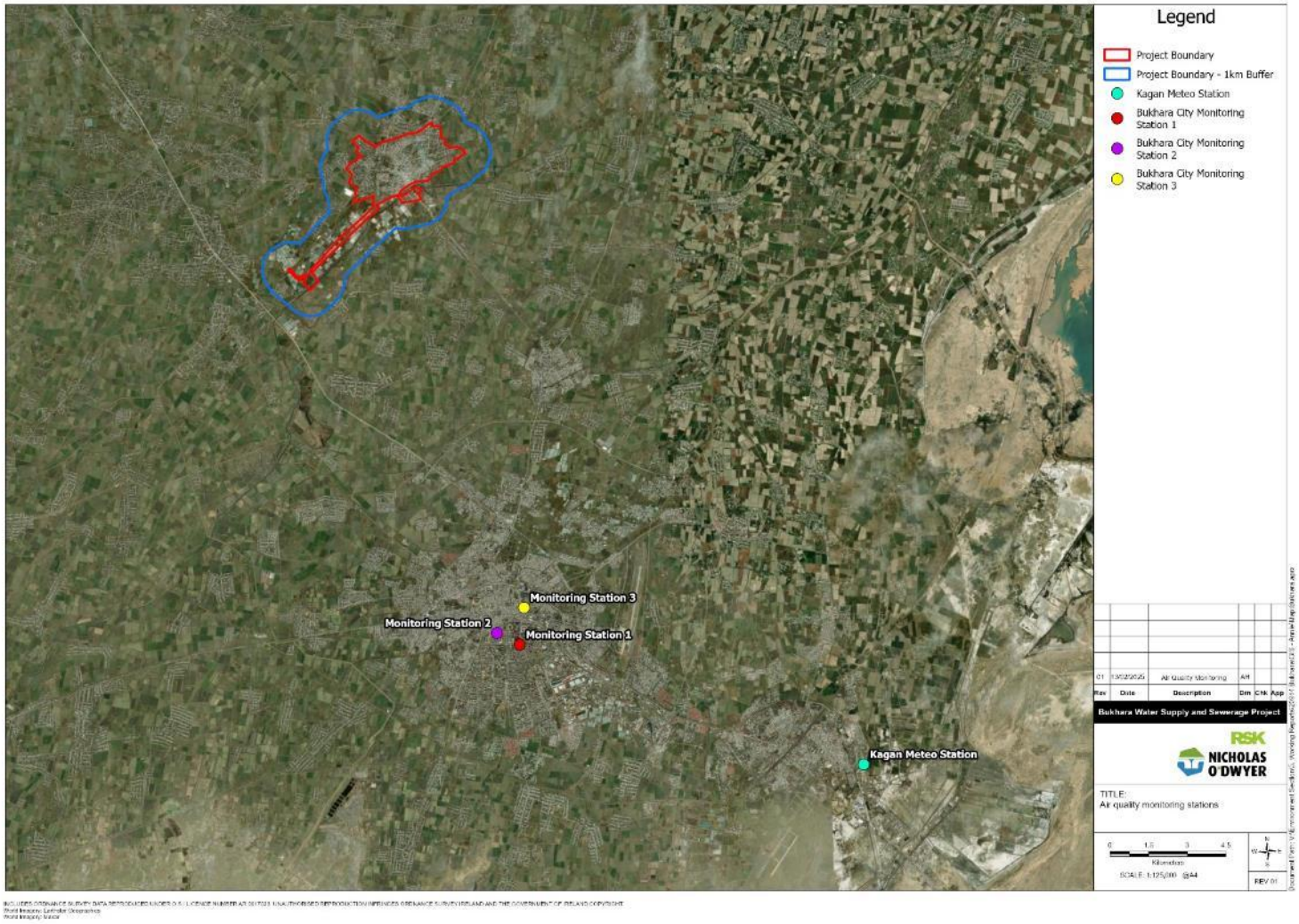


Figure 6.12. Air Quality monitoring stations

6.6 Noise

The existing noise environment of the Project area and its vicinity is largely characterised by vehicular traffic and is the largest consistent noise source.

Noise levels decrease as the distance from the noise source to the receiver increases. Noise generated by a stationary noise source (point source) will decrease by approximately six decibels over hard surfaces and nine decibels over soft surfaces for each doubling of the distance.

Figure 6.6 illustrates the land use and sensitive receptors in the Project area. The pipeline network will be integrated into the existing urban environment. Similarly, the pumping stations will be located within the urban environment, although they will be underground. The WWTP will be situated approximately 550m from the nearest residence which is located to the west of the WWTP site. Noise sensitive receptors in the Project area include residences, schools and religious buildings.

6.7 Archaeology and Cultural Heritage

There is a total of seven UNESCO World Heritage Sites (WHSs) in Uzbekistan, none of which are within the Project boundary. The distances of each WHS to the Project boundary are shown in Table 6.9 below and the WHSs within the proximity to the Project boundary are shown in Figure 6.14. The boundary of the Historic Centre of Bukhara WHS is located *ca.* 13 km south of the Project Boundary at the closest point. The Silk Roads: Zarafshan-Karakum Corridor WHS comprises of thirty-four component parts located in rugged mountains, fertile river valleys, and uninhabited desert, the 866-kilometre corridor runs from east to west along the Zarafshan River and further southwest following the ancient caravan roads crossing the Karakum Desert to the Merv Oasis. The nearest components to the project boundary are presented in Figure 6.14 with the closest component being the Chor Bakh Necropolis, which is located 12.5 km south of the project boundary. Each component of the Zarafshan-Karakum Corridor WHS have an associated buffer which vary in size, however, these buffers are relatively small and do not overlap with the project boundary.

One archaeological monument has been identified within the Project boundary which has been listed on the National list of tangible cultural heritage sites – Tepa-5 in Kharaton village, Ramitan mahalla, Ramitan district. The monument is located *ca*. 230 m east of pumping station (PS) 2 and *ca*. 4.2 km northeast of the WWTP and is shown in Figure 6.13.

Tepa-5's Statement of Significance[20] is, as follows:

"Tepa-5" is a cultural heritage site, an archaeological monument located in the "Ramitan" Mahalla, the Ramitan district, Bukhara region. The site dates back to middle ages (9-10th centuries). Initially it started as a fortress and a settlement. The area is 30 acres (sic). The ownership status: State property. Bukhara regional Department of Cultural Heritage oversees the management of the site. By the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated October 4, 2019, it was included in the National List of Tangible Cultural Heritage Sites and is under state protection'.

[20] https://uz.wikipedia.org/wiki/Tepa_5

Table 6.9. World Heritage Sites in Uzbekistan

	World Heritage Site	Distance from Ramitan Project Boundary to closest UNESCO WHS feature
Cultural Site (x 5)	Silk Roads: Zarafshan-Karakum Corridor (2023), e.g. Chor Bakh Necropolis	*ca*. 12.5 km South (nearest feature along silk roads)
	Historic Centre of Bukhara (1993)	*ca*. 13 km South
	Historic Centre of Shakhrisyabz (2000)	*ca*. 230.6 km South East
	Samarkand – Crossroads of Cultures (2001)	*ca*. 221.4 km East
	Ichan Kala (1990)	*ca*. 373.7 km North West
Natural Site (x 2)	Turanian deserts with Cold Winter (2023)	*ca*. 157.1 km South West
	Tien Shan West (2016)	*ca*. 477.6 km North East

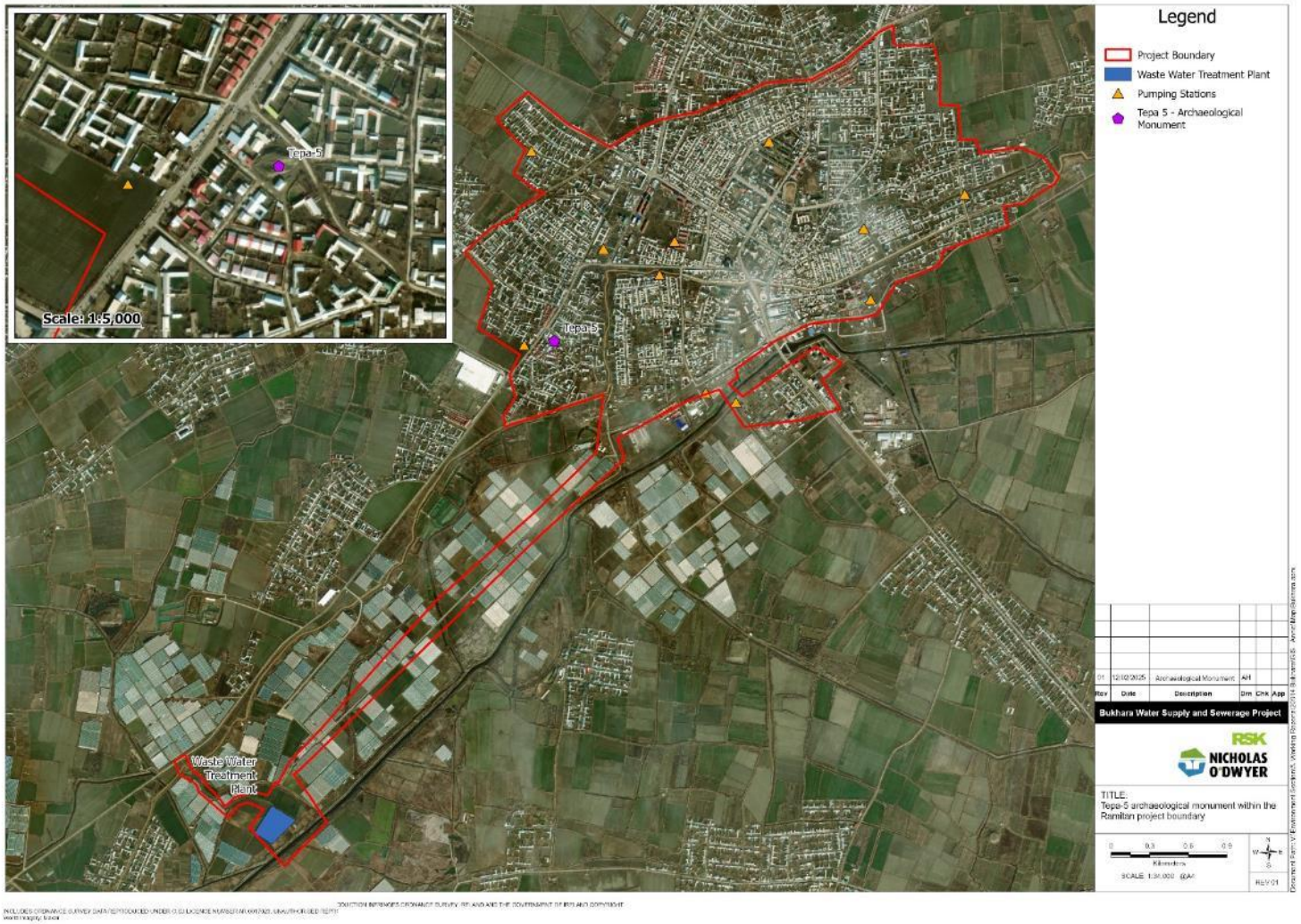


Figure 6.13. Archaeological and cultural heritage sites within proximity to the project boundary

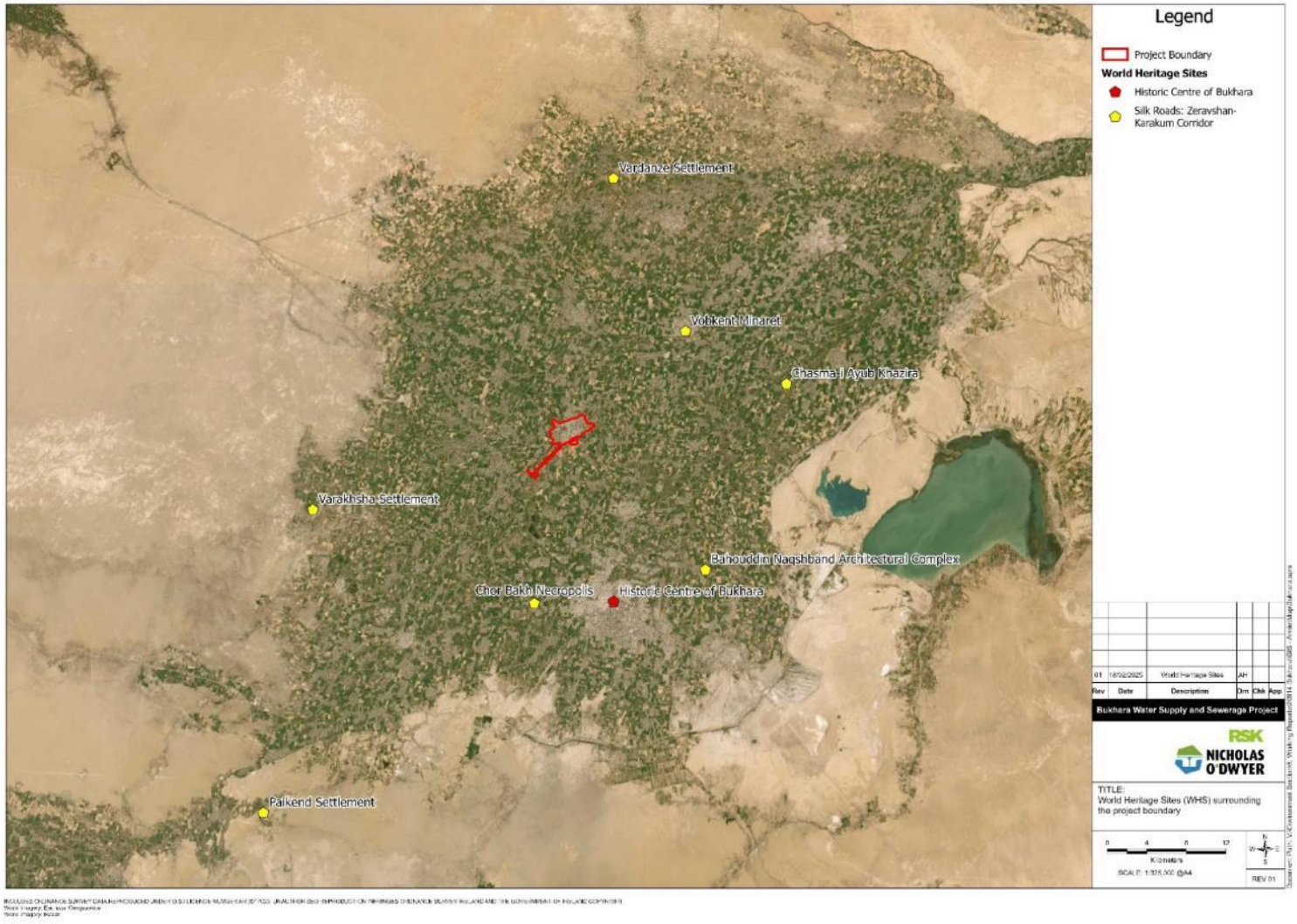


Figure 6.14 UNESCO World Heritage Sites (WHSs) outside the Ramitan Project boundary

6.8 Material Assets

This section describes traffic and transportation in the vicinity of Ramitan and the wider Bukhara Region.

6.8.1 Waste Management

Figure 6.15 shows the location of the Ramitan waste management facility which will handle waste produced by the project during both the construction and operations phase. In terms of sludge produced from the WWTP, sludge will be treated and used as fertiliser, contributing to sustainable practices and minimising waste disposal. The waste management facility is located 2.2km North-East of the WWTP.

6.8.2 Traffic and Transportation

6.8.2.1 Roads

The road network in the Bukhara Region is a combination of national highways, regional roads, and local routes, facilitating transportation within the region and to neighbouring areas. The region is strategically important for both domestic travel and trade due to its location in central Uzbekistan.

The Bukhara Region has a total road length of approximately 11,332 km, with 5,524 km located in the project-related districts. In terms of the Ramitan District, the road network has a total road length of approximately 1,346.6 km. This includes approximately 563.6 km of gravel roads, 456.7 km of asphalt and concrete roads, 283 km of earth roads, and 22 km of black top, 15.3 km of cement and concrete roads. As of 1st January 2023, approximately 348.7 km of roads in Ramitan were in need of repair.

Refer to Table 6.9 below for indicators of road types and lengths in Ramitan.

Table 6.10. Indicators of road types and lengths in Ramitan

Regions	Total length	Cement and concrete	Asphalt and concrete	Black top	Gravel pavement	Earth top	In need of repair as of 01.01.2023
Bukhara region:	**11 331.90**	**187.7**	**4 253.70**	**155.6**	**4 636.80**	**2 098.00**	**3 531.00**
Ramitan	**1,343.6**	**15.3**	**456.7**	**25**	**563.6**	**283**	**348.7**

6.8.2.2 M37 Highway

The M37 is a key national highway that runs through Bukhara and was largely funded through a combination of state resources and international investments, including loans from foreign banks, such as the Asian Development Bank (ADB). It connects several important cities, including Samarkand and the capital, Tashkent, extending westward toward the border with Turkmenistan. This highway is crucial for long-distance travel and freight movement between the central and southern parts of Uzbekistan.

6.8.2.3 Regional and Local Roads

There are numerous secondary roads branching off the M37, connecting Bukhara to smaller towns and villages within the region, such as Gijduvan, Kagan, and Shafirkan. These roads are essential for regional connectivity and access to agricultural areas, which are vital to Bukhara's economy. Local roads and smaller routes further facilitate movement between rural areas and the city of Bukhara, ensuring connectivity for local commerce and agriculture.

The road network in Bukhara also connects to other important regions of Uzbekistan, such as the Khorezm and Navoi regions, facilitating regional trade and mobility. Additionally, the road network connects to international routes leading to neighbouring countries like Turkmenistan, helping to support cross-border trade.

Ramitan District is easily accessible *via* the M37 Highway, situated approximately 5.5 km north of the proposed Ramitan WWTP. The proposed WWTP is easily accessible *via* A380 (approximately 1.8 km) and the M37 Highway, situated an additional 12.5 km to the east along the A380. Locally, as shown Figure 6.15, is the Ramitan WWTP in relation to the surrounding main road network and the Approved Transport Scheme to the network SPS and TDS.

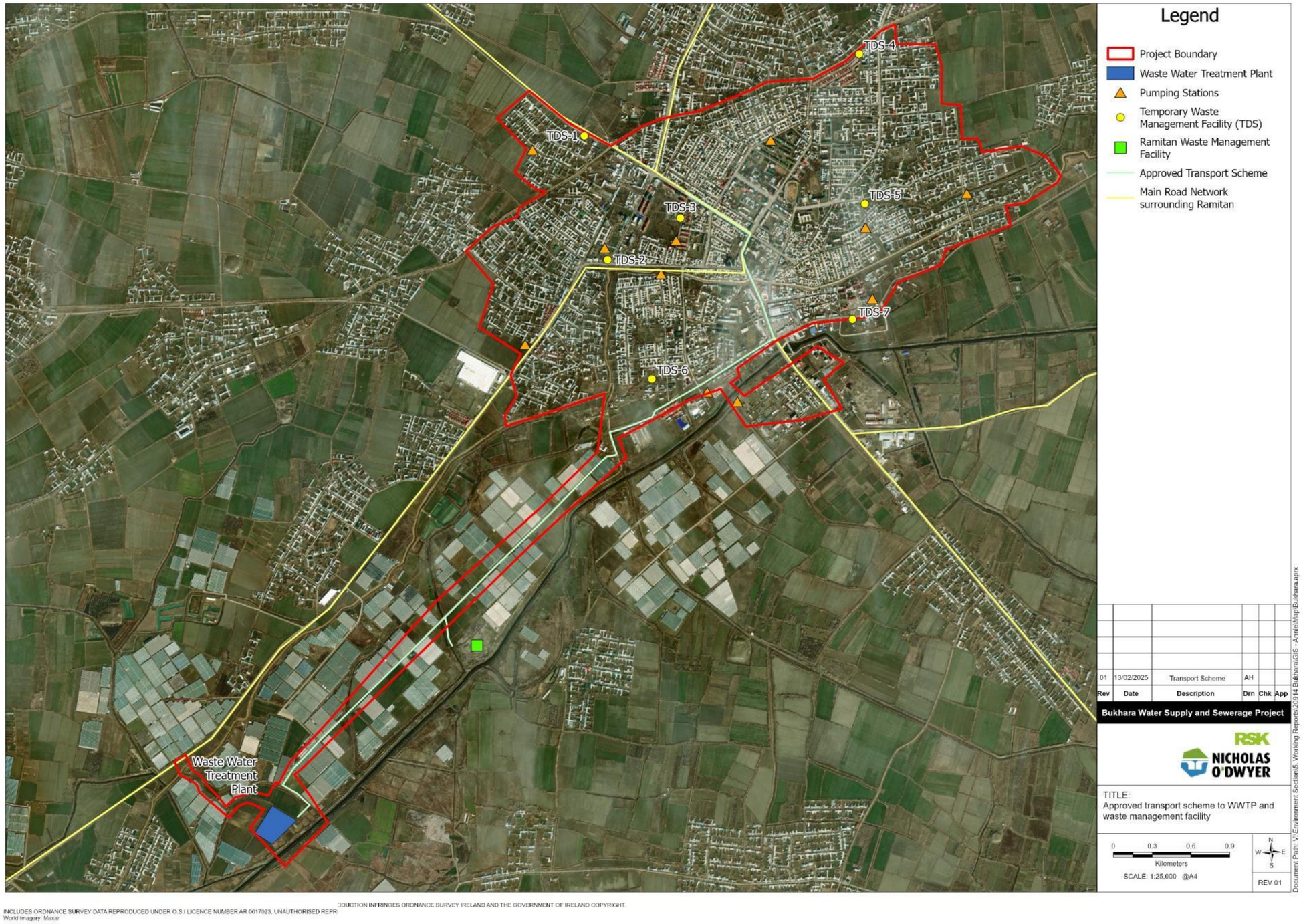


Figure 6.15. Approved transport scheme to the WWTP and waste management facility

6.9 Biodiversity

6.9.1 National State of Biodiversity

The biodiversity of Uzbekistan includes about 27,000 recorded species. Among them higher vascular plants, mosses, lichens, mushrooms and algae make up about 11,000 species, and more than 15,600 are faunal species.

At present, the vertebrate animals of Uzbekistan, which include species registered on the territory of the country for the entire period of zoological research, is represented by five classes and includes 715 species, including 77 species of fish, three species of amphibians, 61 species of reptiles, 467 species of birds and 107 species of mammals.

6.9.2 Ecosystem Diversity

The territory of Uzbekistan is characterized by a wide variety of natural ecosystems. Desert ecosystems are widely represented in flat regions; in mountainous regions, where altitude zonality is well defined, several zonal and climatic zones corresponding to the main types of mountain ecosystems are clearly defined. Aquatic ecosystems are located in both plain and mountain regions, forming specific habitats in each of them. Wetland ecosystems are mainly found in the flatlands of the country.

The following types of natural ecosystems are typical in the territory of Uzbekistan:

- highlands
- mountain ecosystems
- aquatic ecosystems
- foothills and lowlands
- deserts and semi-deserts
- wetland ecosystems

The most widespread types of ecosystems in the Bukhara Region are deserts and semi-deserts, aquatic ecosystems, and wetland ecosystems. Conservation and sustainable use of biodiversity is extremely important for the Bukhara Region. The project footprint is entirely within urban and agricultural zones, which have been previously developed or intensively managed, and do not support sensitive habitats or species of conservation concern.

6.9.3 Endangered Species

General degradation and fragmentation of natural ecosystems, which are intensified by anthropogenic impacts, has led to a reduction in the range and abundance of both rare and resource (hunting) species in Uzbekistan. Such species have an increased risk of extinction in the wild and are recommended for inclusion in the Red Data Book.

There are 207 species and subspecies of animals in various categories of rare and endangered species, 184 of which are listed in the Red Data Book of Uzbekistan (2009), including 24 mammal species, 48 bird species, 16 reptile species, 17 fish species, three ringworm species, 14 mollusc species, and 60 arthropod species.

The International Union for Conservation of Nature (IUCN) Red List includes 73 species and subspecies of animals whose future is of global concern.

6.9.4 Flora of Bukhara

On the desert lands of the Bukhara Region, 580 plant species of 55 families are found. Of these, 18 are endemic. Habitats include sandy steppe, salt marshes and reed beds.

As seen in Figure 6.16 the study area is within the II-4-b Bukhara Region within the Lower Zeravshan phytogeographical district.

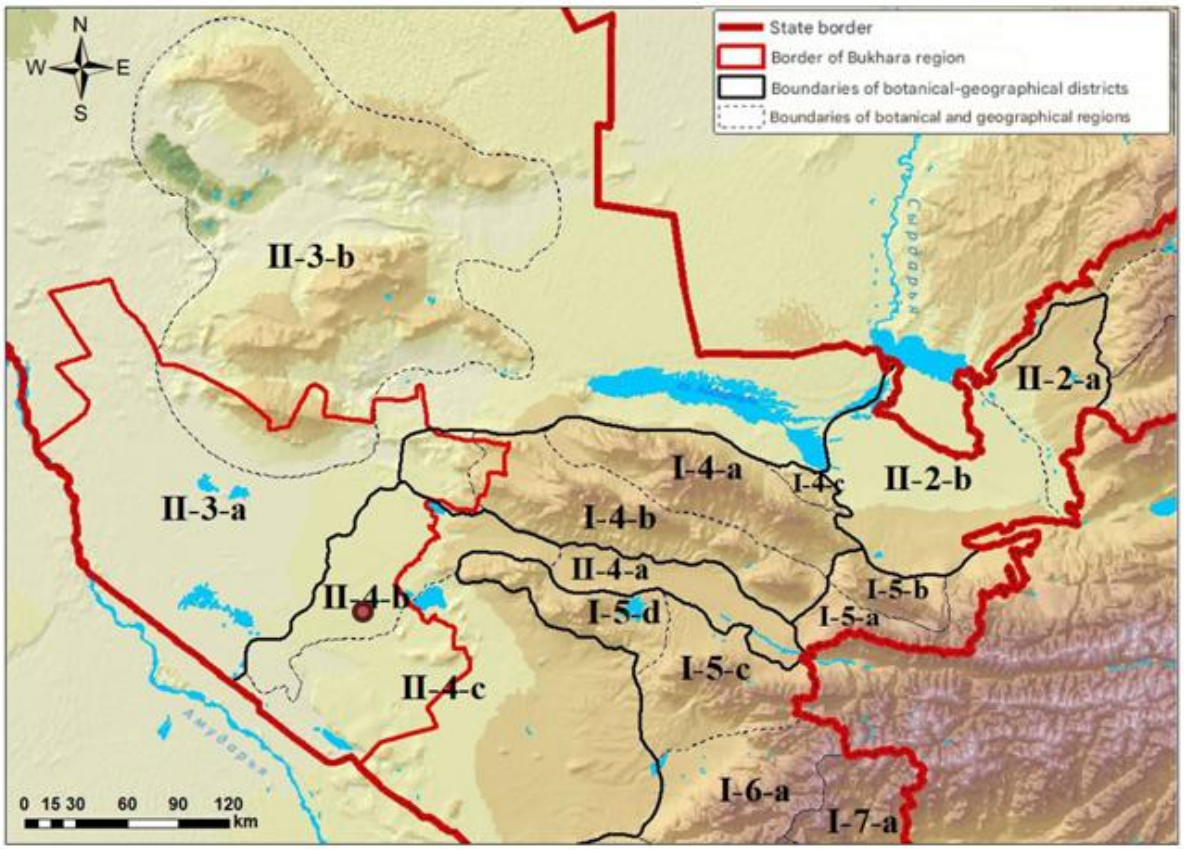


Figure 6.16. Phytogeographical districts of the Bukhara Region and adjacent areas (Tozhibaev et al., 2020).

I. Central Asian Mountainous Province: I-4 Nurata region (I-4-b Aktau district). II. Turan province: II-3 Kyzylkum region (districts: II-3-a Kyzylkum, II-3-b Kyzylkum remnant); II-4 Bukhara region (districts: II-4-b Lower Zeravshan, II-4-c Karshi-Karnabchul).

6.9.5 Fauna of Bukhara

More than 400 species of vertebrate animals are present within the Bukhara Region. In the sub-basins there are 37 species of fish; 2 species of amphibians; 40 species of reptiles; more than 300 species of birds; and at least 300 species of insects.

The fauna of the study area is typical of that of a populated area and is represented by mammals, reptiles and birds. The fauna within the study area is not rich, due to the urban and agricultural land use of the area.

Mammals recorded include long-eared hedgehog as well as rodents including ground squirrel, jird, jerboa, mole vole, and house mouse. Reptiles include Lichtenstein's toadhead agama, rapid racerunner, spotted whip snake, glass-snake, and dwarf sand boa.

The occurrence of birds within the study area is more diverse, and many recorded species are semi-aquatic birds. This is due to the presence of the river which provides feeding, nesting and resting areas for the birds. Birds that have been recorded in the study area include Turkestan ground jay, Asian desert warbler, houbara bustard, lark, quail, sparrow, barn swallow, European turtle dove, starling, myna, wagtail.

Within the shallow areas of the collector system that run through Ramitan, species such as green toad, marsh frog, and water snake can be found, as well as, a large group of insects, Such as grasshoppers, crickets, praying mantises, bumblebees and wasps.

6.9.6 Aquatic Environment

Since the 1940s there has been a large growth in the construction of irrigation canals and reservoirs in Uzbekistan, with over 6,000km of canal being constructed in the last 60 years. This growth has led to large changes in the natural aquatic environment. The building of dams and reservoirs has caused a major change to fish species with a decline in rheophilic fish (fish that require water current) and have stopped fish migration. The formation of reservoirs has also flooded the natural spawning and feeding grounds which have lower reproduction rates causing a decline in fish.

The construction of sewage networks and treatment facilities will prevent the discharge of untreated wastewater onto the terrain and into open watercourses, as periodically occurs in the current scenario. Wastewater from the Ramitan Wastewater Treatment Plant will be discharged into The discharge effluent from the Ramitan WWTP will be discharged into the Central Bukhara Collector. This collector leads is also reaching to the Zarafshan River and finally to the Amu Darya River.

The Amu Darya River is a very large river system, but it dries up before reaching Lake Aral. The Zarafshan River is one of the 5 tributaries of the Amu Darya River. It originates from the Zeravshan Glacier near the junction of the Turkestan Range and the Zeravshan Range of the Pamir-Alay Mountains in Tajikistan. It flows westward for about 300 kilometers, entering Uzbekistan after passing Panjakent, where it turns west to north, passing by the city of Samarkand, where it feeds the Dargom Canal, which is entirely dependent on the oasis thus created, then turns left again, heading west and further southwest to the north of Navoiy, passing Bukhara and reaching Dengizkul Lake in the desert beyond Karakul district. However, it does not exactly reach the Amu Darya, of which it used to be a tributary.

The Denguizkul Lake State Wildlife Sanctuary and RAMSAR site are hydrologically connected to the proposed WWTP outfall, the RAMSAR site is connected through the Amu-Darya River and canal network (ca. 81km downstream of the outfall location). This lake is of international ornithological importance and is a state ornithological reserve.

Similarly, the Zarafshan River is an extremely important natural resource for fisheries reservoirs in the Bukhara region. The lower reaches of the Zarafshan River constitute one of the most important fish reservoirs in Western Uzbekistan

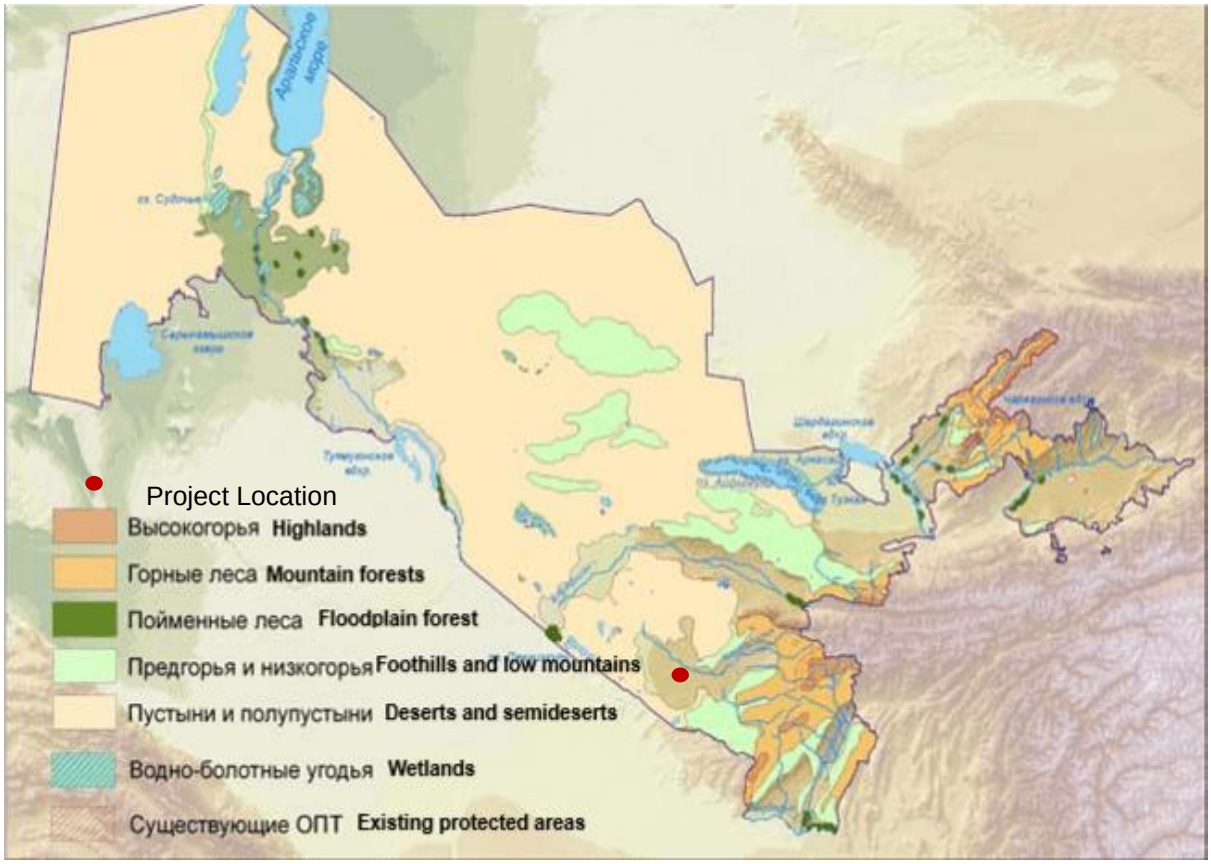


Figure 6.17. Main natural ecosystems of Uzbekistan

(Source: https://www.cbd.int/countries/?country=uz)

Effects on Aquatic Biodiversity and Biodiversity Of the Zarafshan River Catchment Basin

Zarafshan River Basin

The aquatic ecosystems of the lower reaches of the Zarafshan River revealed the distribution of 49 species and 2 subspecies of molluscs. They are distributed in aquatic ecosystems as follows: 32 species and 2 subspecies of molluscs were distributed in the lower reaches of the Zarafshan River, in Navbakhorsky fish farm - 22 species, in Khatyrchinsky fish farm - 15 species, in Nurbuloksaysky fish farm - 22 species and in Maidonsoysky - 18 species. They belonged to pelolimnophilic, peloreophilic, rheophilic, crenophilic, phytophilic, madicol, limno-crenophilic and telmatophilic ecological groups.

Based on surveys of natural and artificial fisheries reservoirs in Bukhara region and analysis of the literature on the ichthyofauna of the region, 32 fish species belonging to 6 genera and 12 families were found in the region. Of these 32 species, 23 species are listed in the Red Data Book of the International Union for Conservation of Nature (IUCN) and 5 species are listed in the Red Data Book of the Republic of Uzbekistan. The aquatic species are given in the Table 6.16.

However, in the mid-twentieth century, anthropogenic destruction of zoogeographic barriers on land led to the introduction of invasive species into the fauna of most regions, especially the hydrofauna, which remained unchanged for a long time.

Table 6.11. Aquatic ecosystems of the lower reaches of the Zarafshan River. Diversity and ecological groups of molluscs (Source: https://doi.org/10.1051/e3sconf/202126204009)

No.	Family and species	Lower course of the Zarafshan river	Navbakhor fish farm	Khatyrchi fish farm	Sources	Springs	Ecological groups
	Bivalvia class Unionidae family Sinanodonta genus						
1	Sinanodonta gibba	+	+	-	-	-	Peloreophile
2	Sinanodonta orbicularis	+	-	+	-	-	Peloreophile
3	Sinanodonta puerorum	+	-	+	-	-	Peloreophile
	Colletopterum genus						
4	Colletopterum bactrianum	+	-	+	-	-	Rheophile
5	Colletopterum cyreum sogdianum	+	-	+	-	-	Rheophile
6	Colletopterum ponderosum volgense	+	-	+	-	-	Pelolimnophile
	Corbiculidae family Corbicula genus						
7	Corbicula cor	+	+	+	-	-	Peloreophile
8	Corbicula fluminalis	+	+	-	-	-	Peloreophile
9	Corbicula purpurea	+	-	+	-	-	Peloreophile
	Corbiculina sort						
10	Corbiculina tibetensis	+	-	+	-	-	Peloreophile
11	Corbiculina ferghanensis	-	+	+	-	-	Peloreophile
	Sphaeridae family Musculium genus						
12	M.hungarica	+	-	-	+	-	Pelolimnophile
	Euglesidae family Euglesa genus						
13	Euglesa hissarica	-	-	-	+	-	Pelolimnophile
14	Euglesa heldreichi	-	-	-	-	+	Peloreophile
15	Euglesa turkestanica	-	-	-	+	-	Pelolimnophile
16	Euglesa obliquata	-	-	-	-	+	Pelolimnophile
17	Euglesa turanica	-	-	-	-	+	Pelolimnophile
	Pisidiidae family Odhneripisidium genus						
18	Odhneripisidium behningi	-	-	-	+	+	Crenophile
	Kuiperipisidium genus						
19	Kuiperipisidium terekense	-	-	-	+	+	Crenophile
20	Kuiperipisidium issykkulense	-	-	-	+	-	Crenophile
21	Kuiperipisidium sogdianum	-	-	-	+	-	Crenophile
22	Kuiperipisidium polytimeticum	-	-	-	+	-	Crenophile
	Gastopoda class Neritidae family Theodoxus genus						
23	Theodoxus.pallasi	+	-	-	+	-	Peloreophile
	Valvatidae family Cincinna genus						

24	Cincinna.pamirensis	+	-	-	-	-	Pelolimnophile
25	Cincinna.piscinalis	+	-	-	-	-	Pelolimnophile
	Belgrandellidae family Bucharamnicola genus						
26	Bucharamnicola.vucharica	+	+	-	+	-	Crenophile
	Martensamnicola genus						
27	Martensamnicola. Brevicula		+	-	+	-	Crenophile
28	Martensamnicola.hissarica	+	+	-	+	-	Crenophile
	Horatiidae family Sogdamnicola genus						
29	Sogdamnicola. Pallida		+	-	+	-	Crenophile
30	Sogdamnicola.shadini	+	-	-	+	-	Crenophile
	Lymnaeidae family Lymnaea genus						
31	Lymnaea. Stagnalis	+	+	-	-	-	Phytophile
32	Lymnaea.impura	+		-	-	-	Phytophile
33	Lymnaea.oblonga	+	+	-	-	+	Madikol
34	Lymnaea.goupili		+	-	+	+	Madikol
35	Lymnaea.thiesseae	+	+	-	-	+	Madikol
36	Lymnaea.truncatula	+	+	+	+	+	Madikol
37	Lymnaea.subangulata		+	-	-	+	Madikol
38	Lymnaea.almaatina	+	+	-	+	-	Limno-crenophile
39	Lymnaea.bowelli	+	+	-	+	-	Limno-crenophile
40	Lymnaea.tenera	+	+	+	-	+	Phytophile
41	Lymnaea.rectilabrum	+	-	+	-	+	Phytophile
42	Lymnaea.psilia	+	+	+	-	+	Phytophile
43	Lymnaea.fontinalis	+	+	+	-	+	Phytophile
44	Lymnaea.lagotis	+	-	+	-	-	Telmatophile
	Phisidae family Costatella genus						
45	Costatella. Acuta	+	+	-	+	-	Phytophile
	Planorbidae family Planorbis genus						
46	Planorbis. Planorbis	+	+	-	-	+	Phytophile
47	Planorbis.tangitarensis	+	-	-	-	+	Phytophile
	Anisus genus						
48	Anisus. Acronicus	-	+	-	+	+	Phytophile
49	Anisus.albus	-	-	-	-	+	Phytophile
50	Anisus.centralis	+	-	-	+	-	Pelolimnophile
51	Anisus.albopersicus	+	-	-	+	-	Phytophile
Total species		34	22	15	22	18	

Lake Denguizkul,

It is a Ramsar site, located ca. 31.5km southwest of Karakul. The area and depth of the lake are constantly changing: in high-water years, the lake surface reached 110-120 thousand hectares, with a water volume of 3-3.5 billion cubic meters, the greatest depth is 25-30 m. The water is very salty; the lake bed is covered with salt of a thickness in the region of 4-6 cm. According to the Main Department

of Water Management of the Republic of Uzbekistan, the estimated water level in Lake Denguizkul is 184.2 - 184.4 m. Due to the high salinity, the water is brackish. Lake Denguizkul is endorheic, 25-30% of the lake area is covered with reed thickets and shrubs, making it favourable for the reproduction and development of fish. This lake is of international ornithological importance and is a state ornithological reserve. Over a hundred species of avifauna use the lake as a migration route in spring and autumn and more than fifty species of waterfowl winter here. Ornithological surveys were carried out on the entire coast and water area of the lake, including a large bay in the northwest. During the ornithological examinations, hundreds of species of birds were recorded, among them there are birds of high priority: white-headed duck (1 priority), white-eyed pochard (1), Dalmatian pelican (2), Asian snipe godwit (2), Pallid Harrier (2), Great Falcon (2). Seventeen bird species are included in the Red Book of the Republic of Uzbekistan. Six species belong to the fourth priority group: Mallard, Pochard and Red-crested Pochard, Coot, Great Cormorant and Common Shelduck, as well as three species whose range is limited to the Eurasian Deserts and Semi-Deserts biome (Booted Warbler, Aquatic Warbler and Desert Finch. The species are given in Table 6.18.

As a result, the hydrological regime of Dengizkul Lake is fundamentally unstable. Use of water for domestic use and for agriculture is projected to increase. Proposed major changes to national irrigation regimes, notably diversion of water to the Aral Sea restoration project, potentially pose a significant longer-term threat to water levels at Dengizkul Lake and thus to the ornithological value of the site is given in Table.

Table 6.12. List of Birds of Dengizkul Lake Identified in 2012 (Source:LUKOIL Uzbekistan Operating Company LLC, 2013)

Priority	Species	Reason of presence	Protection status of the	Month				
				May	June	Sept e	November	
Podicipediformes								
n/l	Great Crested Grebe Podiceps cristatus*	N		2	17	34		8
n/l	Black-necked Grebe Podiceps nigricollis	M, W				600	59	15
n/l	Little Grebe Podiceps ruficollis	M, W				2		
Pelecaniformes								
2	Dalmatian Pelican Pelecanus crispus*		RDBUz VU IUCN VU	11	60	409		
3	White Pelican Pelecanus onocrotalus	M	RDBUz VU		20			
4	Greater Cormorant Phalacrocorax carbo*	N		78	463	1641	672	215
3	Pygmy Cormorant Phalacrocorax pygmeus*	N	RDBUz NT	79	48	33	11	1
Ciconiiformes								
3	Little Egret Egretta garzetta*	N	RDBUz VU	4	19	39		
n/l	Great Egret Egretta alba*	N		22	79	3	19	
n/l	Grey Heron Ardea cinerea*	N		14	62	25	13	1
3	Glossy Ibis Plegadis falcinellus*	M, N	RDBUz VU	1	127			
3	Spoonbill Platalea leucorodia*	M	RDBUz VU	9		14		
Phoenicopteriformes								
3	Greater Flamingo Phoenicopterus roseus	M,S	RDBUz VU		58	48	3	
Anseriformes								
3	Mute Swan Cygnus olor*	R	RDBUz NT	151	227	183	208	46

n/l	Greylag Goose Anser anser	N?M			10	3	30	15
4	Shelduck Tadorna tadorna*	N, M		13	44	12	1335	250
n/l	Ruddy Shelduck Tadorna ferruginea*	N, M		8	7			10
4	Mallard Anas platyrhynchos	N, W				41	976	110
n/l	Gadwall Anas strepera*	N, M		2	3	24		
n/l	Pintail Anas acuta	M					6	
n/l	Shoveler Anas clypeata*	N?, M		80		3	18	
n/l	Teal Anas crecca	M, W					62	99
n/l	Eurasian Wigeon Anas penelope	M, W					21	50
4	Red-crested Pochard Netta rufina*	N, W		299	742	151	910	
4	Pochard Aythya ferina	N,M, W			75	6716	1420	3
1	Ferruginous Duck Aythya nyroca*	M, W	RDBUz NT, IUCN NT	3			8	
n/l	Tufted Duck Aythya fuligula*	M, W		6		6	369	100
1	White-headed Duck Oxyura leucocephala	M, W	RDBUz EN, IUCN EN				312	
4	Goosander Mergus merganser	M, W					3	
Falconiformes								
2	Pallid Harrier Circus macrourus	M	RDBUz NT, IUCN NT			2		
n/l	Marsh Harrier Circus aeruginosus	R		1	4		2	1
n/l	Long-legged Buzzard Buteo rufinus	R		1				
n/l	Common Buzzard Buteo buteo	M						1
3	White-tailed Sea Eagle Haliaeetus albicilla	M, W	RDBUz VU				14	7
2	Greater Spotted Eagle Aquila clanga	M	RDBUz VU, IUCN VU			2		
3	Golden Eagle Aquila chrysaetos	S	RDBUz VU		1			
3	Lesser Kestrel Falco naumanni	M	RDBUz NT,			1		
n/l	Common Kestrel Falco tinnunculus	N,M					2	1
Galliformes								
n/l	Pheasant Phasianus colchicus	R			1			
Gruiformes								
4	Coot Fulica atra*	M, W		1386		32	1168	
Charadriiformes								
n/l	European Golden Plover Pluvialis apricaria*	M		2	3			
n/l	Ringed Plover Charadrius hiaticula*	M		5				
n/l	Little Ringed Plover Charadrius dubius*	M, N		13	43	5		
n/l	White-tailed Lapwing Vanelochettusia leucura*	N		2				
n/l	Black-winged Stilt	N		37	339			

	Himantopus himantopus*							
n/l	Pied Avocet Recurvirostra avocetta*	N		21				
n/l	Common Greenshank Tringa nebularia*	M, W		23	3			
n/l	Common Redshank Tringa totanus*	M, W		12	107	23		2
n/l	Common Sandpiper Actitis hypoleucos	M			3			
n/l	Marsh Sandpiper Tringa stagnatilis*	M		17	2			
n/l	Little Stint Calidris minuta*	M		16				
n/l	Dunlin Calidris alpina*	M		358		574		
2	Eurasian Curlew Numenius arquata*	M	IUCN NT	7				1
2	Black-tailed Godwit Limosa limosa*	M	IUCN NT	1	18			
2	Asian Dowitcher Limnodromus semipalmatus*	M	RDBUz VU, IUCN NT	2				
n/l	Collared Praticole Glareola pratincola	N			9			
n/l	Yellow-legged Gull Larus cachinnans*	N,M,W		17	133	214	105	2
n/l	Slender-billed Gull Larus genei*	N, M,W		355	88	3194	98	
n/l	Black-headed Gull Larus ridibundus	N,M						15
n/l	Caspian Tern Hydroprogne caspia*	S		13	5			
n/l	Gull-billed Tern Gelochelidon nilotica	N			3			
n/l	Common Tern Sterna hirundo*	N		3	21	1		
n/l	Little Tern Sterna albifrons	N			22			
Columbiiformes								
n/l	Black-bellied Sandgrouse Pterocles orientalis	R			1		1	
n/l	Rock Dove Columba livia	R			8			2
Cuculiformes								
n/l	Common Cuckoo Cuculus canorus	N, M		1				
Strigiformes								
n/l	Little Owl Athene noctua	R				2		
Caprimulgiformes								
5	Egyptian Nightjar Caprimulgus aegyptius	N		1				
Coraciiformes								
2	Eurasian Roller Coracias garrulus	N	IUCN NT	10	1			
n/l	European Bee-eater Merops apiaster	M, N				3		
n/l	Blue-cheeked Bee-eater Merops superciliosus	M,N			1			
Passeriformes								
n/l	Crested Lark Galerida cristata	R		7	234	17	6	8
n/l	Barn Swallow Hirundo rustica	N				1700		
n/l	Sand Martin Riparia riparia	S			1206	4880		

n/l	Pied (Masked) Wagtail Motacilla personata	N		21				
n/l	Citrine Wagtail Motacilla citreola	M		22				
n/l	Yellow Wagtail Motacilla flava	M		248				
n/l	Black-headed Wagtail Motacilla (flava) feldegg	N		4				
n/l	White Wagtail Motacilla alba	M,W				6		
n/l	Isabelline Shrike Lanius isabellinus	N		1		2		
n/l	Great Grey Shrike Lanius excubitor	N, R?					1	
n/l	Common Myna Acridotheres tristis	R		2	4	6		2
n/l	Eurasian Hooded Crow Corvus cornix	M,W					7	3
5	Streaked Scrub Warbler Scotocerca inquieta	N,R?						1
5	Southern Booted Warbler Hippolais rama	N,M		2	2		1	
n/l	Pied Wheatear Oenanthe pleschanka	N		6				
n/l	Isabelline Wheatear Oenanthe isabellina	N		2		1		
n/l	Rufous Scrub Robin Cercotrichas galactotes	N		1				
n/l	Indian House Sparrow Passer indicus	N		205	100			
n/l	Tree Sparrow Passer montanus	R					30	
n/l	Spanish Sparrow	N					1	
	Passer hispaniolensis							
n/l	Common Chaffinch Fringilla coelebs	M,W						1
n/l	Eurasian Siskin Spinus spinus	M						1
5	Desert Finch Rhodospiza obsoleta	R		4	14		26	
n/l	Corn Bunting Emberiza calandra	M,W					4	
	Total birds / waterbirds			3601 / 3062	4437/ 2860	20662/ 14040	7921/ 7826	971/ 946
	Total species / waterbird species			53/ 35	45/ 32	39/ 27	44/ 32	29/ 18

Notes.Priority species in groups 1-5 as identified in BAP. n/l = not listed in one of those groups.oReason of presence: N- nesting, R- resident, M- migrating, W- wintering, S- summering (making summer migrations).

Protection status in accordance with the Red Book of the Republic of Uzbekistan (2009) and Red List of IUCN (2012): EN-Endangered; VU- Vulnerable; NT- Near-Threatened.

* - partial survey is carried out in four points only (from the bridge on either side, at point 57 and in the bay near the road after the bridge)

6.9.7 Protected Areas

At present, seven reserves (188.3 thousand hectares), a complex landscape reserve (628.3 thousand hectares), two biosphere reserves (111.7 thousand hectares), three national nature parks (558.2 thousand hectares), a complex landscape reserve (628.3 thousand hectares), two biosphere reserves (111.7 thousand hectares), three national parks (558.2 thousand hectares), a national park “Durmen” (32.4 ha), 10 natural monuments (3.8 thousand ha), 12 wildlife sanctuaries (572.4 thousand ha, including Karnabchul, Mubarek, and Nurabad, see **Ошибка! Источник ссылки не найден.**) and the

Bukhara Specialized Nursery "Jeyran" (16.5 thousand hectares), as well as forest and forest hunting farms (11.121 million hectares) exist in the Bukhara Region.

However, there are no protected areas in the Project area directly. Other areas are, however, located within the surrounding areas. Figure 6.19 illustrates the protected natural areas within the surrounding area of the project boundary, and Table 6.13 includes the distances to the project boundary.

Table 6.13. Protected Natural Areas of Uzbekistan and their proximity to the project boundary

Protected Area - Type	Protected Area - Title	Distance from Project Boundary
Natural Monument	Varakhsho Natural Monument	*ca*. 22.3 km West
Ramsar Site, Wetland of International Importance	Tudakul and Kuymazar Water Reservoirs	*ca*. 28.6 km East
Nature Nursery	Bukhara Specialized Nursery “Jeyran” Nature Nursery	*ca*. 32.6 km Southeast
Natural Monument	Paykend Natural Monument	*ca*. 43.3 km Southwest
State Wildlife Sanctuary	Kumsultan State Wildlife Sanctuary	*ca*. 44.7 km South
State Wildlife Sanctuary	Khadicha State Wildlife Sanctuary	*ca*. 50.4 km South
State Wildlife Sanctuary / Ramsar site, Wetland of International Importance	Denguizkul State Wildlife Sanctuary	*ca*. 78.7 km South
State Wildlife Sanctuary	Mubarek State Wildlife Sanctuary	*ca*. 81.9 km Southeast

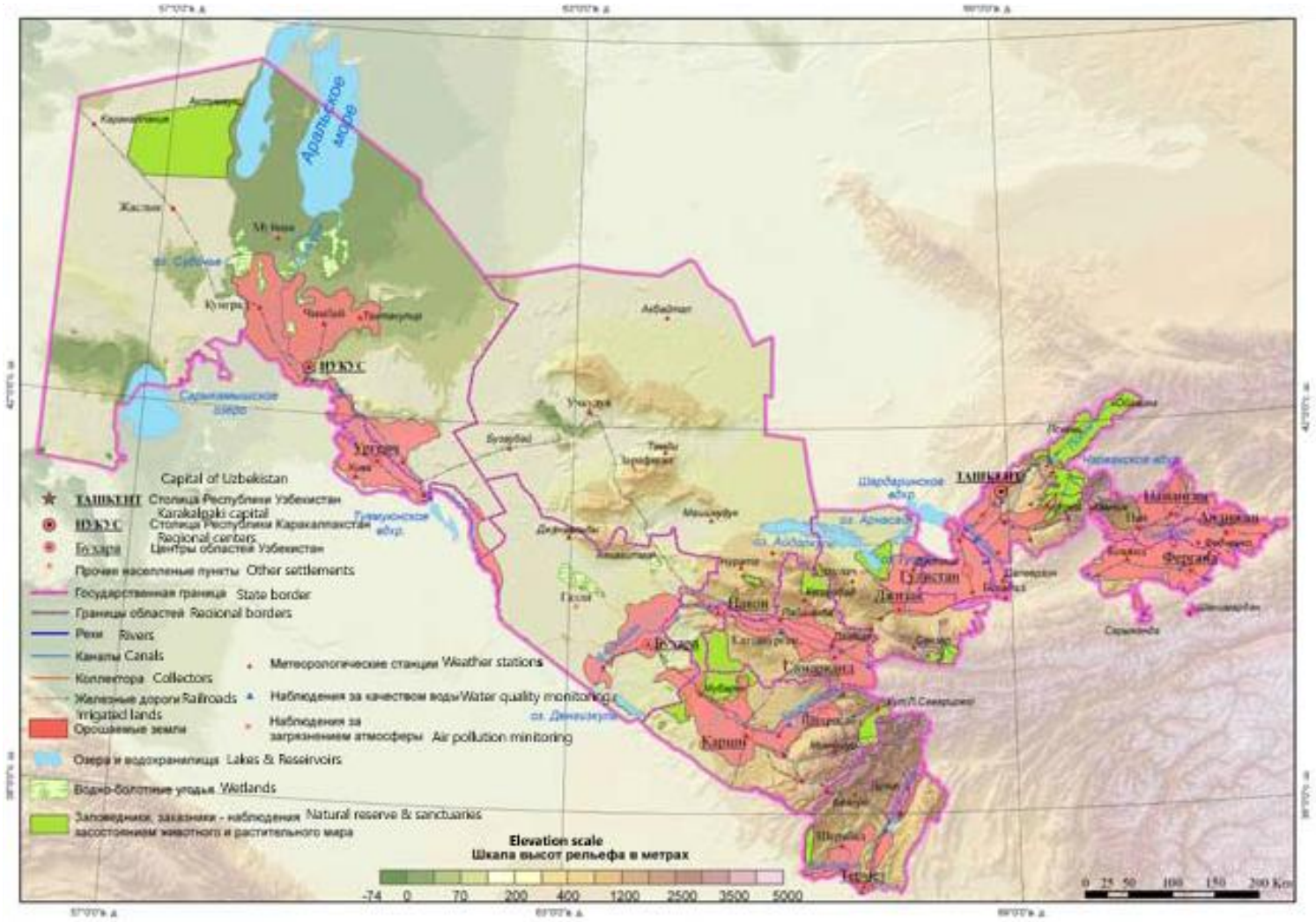


Figure 6.18. Protected Natural Areas of the Republic of Uzbekistan
(*Source:* https://www.cbd.int/countries/?country=uz)

a) **Lake Denguizkul**, is a Ramsar site, located *ca*. 78.7 km south of Ramitan. Explained above.

b) **Kumsultan State Wildlife Sanctuary i**s a lake located *ca*. 44.7 km south of the Project boundary and is an important spawning site for fish and migration routes of birds. The site has a state level of protection.

c) **Paykend Natural Monument** is located *ca*. 43.3 km southwest of the Project boundary. Within the area of the monument the following species listed in the Red Book of Uzbekistan have been recorded: MacQueen's Bustard (*Chlamydotis macqueenii*), Desert Monitor (*Varanus griseus*), Central Asian Tortoise (*Testudo horsfieldi*), Desert Sand Boa (*Eryx miliaris*) and Tatar Sand Boa (*Eryx tataricus*).

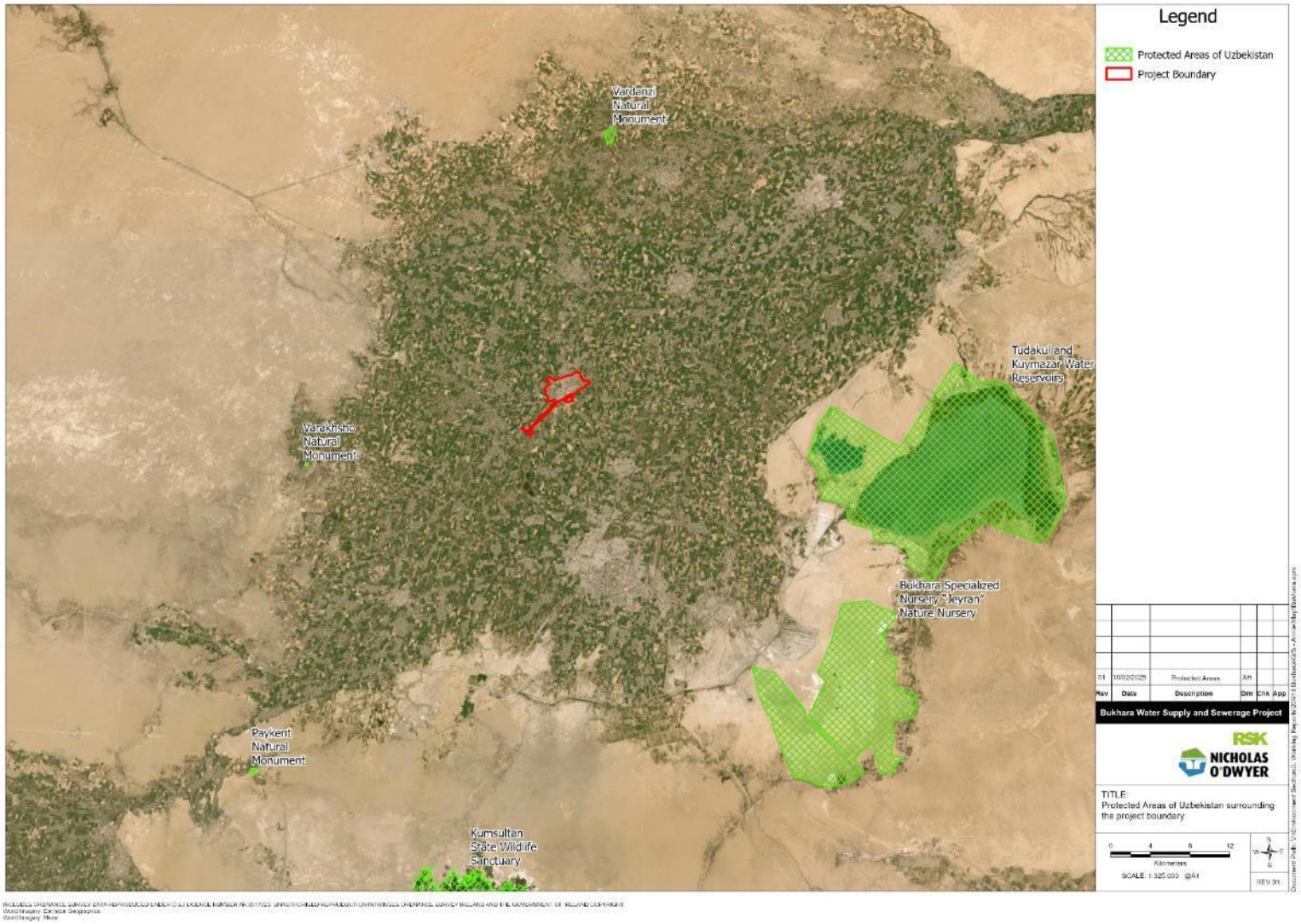


Figure 6.19. Protected natural areas of Uzbekistan surrounding the project boundary

7 SOCIAL BASELINE

This section of the ESIA presents preliminary socio-economic baseline data and an assessment based on available secondary information, site inspections and consultations with stakeholders, and identifies areas of impact. Data from the World Bank, Statistics Agency under the President of the Republic of Uzbekistan (www.stat.uz), data from the Bukhara regional Branch of the Statistics Agency under the President of the Republic of Uzbekistan (www.buxstat.uz), Passports of MSG (Mahalla Citizens Gatherings) and other regional offices of departments and organizations were used in preparing this section of the report.

This section examines and provides the following socio-economic baseline data and assessment:

1. Administrative - Territorial Structure of the Project City;
2. Demographics (Population, Gender and Age Structure, Birth Rates, Mortality Rates, etc.);
3. Gender Equality;
4. Public health;
5. Migration;
6. Living Standards;
7. Social Infrastructure;
8. Engineering Infrastructure;
9. Economy;
10. Transport; and
11. Agriculture.

7.1 Administrative -Territorial Structure of the Project City

The cities of Alat, Gijduvan**,** Karakul, Karaulbazar and **Ramitan** are the district centres of the eponymous districts. There are Mahalla Citizens Gathering (MSG) in each city, the number of which is determined by the population size and the occupied area of the city.

The sub-project area includes eight Mahalla Citizens Gatherings (Mahallas), of which seven are located on the territory of the district centre: A. Navoi, Ramitan, Bobur, Uba, Zarafshon, Tarnaut, Afrosiyob, Guliston, Ibin Sino.

Table 7.1 The number of MSG, streets and courtyards in district centres of the project cities

District centre	Total number of MSG	MSG included in the design	MSG Name	The total area of MSG	Number of MSG streets	Number of courtyards
Alat	10	10	MSG Khalifa	32.5	17	1,225
			MSG Bunyodkor	13	7	511
			MSG Navruz	568	5	418
			MSG Eski Olot	22	2	372
			MSG Ma'rifat	26.4	8	391
			MSG Khalkobod	9.2	3	191
			MSG Ok Oltin	22	3	372
			MSG Jayhunabad	429	7	591
			MSG Asajam	235	8	595

District centre	Total number of MSG	MSG included in the design	MSG Name	The total area of MSG	Number of MSG streets	Number of courtyards
			MSG Solo Karaul	1,136.5	4	763
Gijduvan	14	18	MSG Chorsu	N/A	8	644
			MSG Sardor	N/A	6	403
			MSG Kurgon	N/A	8	510
			MSG A.Gijduvoniy	N/A	5	451
			MSG Dilkusho	N/A	7	538
			MSG F.Hujaev	N/A	5	754
			MSG Shark	N/A	5	1,243
			MSG A.Kahhor	N/A	5	646
			MSG Pomuza	N/A	4	680
			MSG Guliston	N/A	3	471
			MSG Bobur	N/A	7	910
			MSG Galaba	N/A	2	561
			MSG Nodirabegim	N/A	4	530
			MSG Degrezon	N/A	6	581
			MSG Gulistonobod	N/A	5	954
			MSG Havzak	N/A	6	780
			MSG Mustakillik	N/A	4	588
			MSG Pozagari	N/A	5	570
Karakul	8	8	MSG Eski Kal'a	39.1	N/A	882
			MSG Paxtakor	23.5	N/A	616
			MSG Zarafshon	45.7	N/A	577
			MSG Chekirchi	66.9	N/A	731
			MSG Dustlik	52.2	N/A	646
			MSG Tinchlik	56.6	N/A	834
			`MSG Taykir	51.6	N/A	625
			MSG Regi Haydar	144.6	N/A	782
Karaulbazar	3	2	MSG Chulkuvar	256	6	792
			MSG Tinchlik	78.4	10	1,378
Ramitan	7	9	MSG A.Navoiy	73	4	568
			MSG Gulistan	59	5	401
			MSG Afrasiyob	49	6	414
			MSG Ibn Sino	53	5	603
			MSG Zarafshan	62	8	563
			MSG Bobur	50	4	391
			MSG Ramitan	58	2	312
			MSG Bogcha	102	4	736
			MSG Tarnaut	136	9	873
Total	**42**	**47**				

Summarises the areas, number of streets, and courtyards expected to be covered by the project in Gijduvan.

Table 7.2. Information on MSG area, number of streets and households – Ramitan (2023)

District centre	Total number of MSG	MSG included in the design	MSG Name	The total area of MSG (ha)	Number of MSG streets	Number of courtyards
Ramitan	**7**	**9**	MSG A.Navoiy	73	4	568
			MSG Gulistan	59	5	401
			MSG Afrasiyob	49	6	414
			MSG Ibn Sino	53	5	603
			MSG Zarafshan	62	8	563
			MSG Bobur	50	4	391
			MSG Ramitan	58	2	312
			MSG Bogcha	102	4	736
			MSG Tarnaut	136	9	873

9 MSGs are covered by the project in Ramitan. The total project area in this city is 642 hectares, where 4861 courtyards are located within the area. The number of MSG streets included is a total of 47.

7.2 Demographics

7.2.1 Population

The total population of the five district centres was 169, 919 people as of January 1, 2024 (100% of the total population, see Table 7.3). Ramitan District had a population of 29 057 inhabitants in January 2024, which includes 14 576 men and 14 481 women. The population density is 49.2 people/km^2 in the Bukhara Region.

Table 7.3. The population of district centres (2024*)

District centre*	Total in d/c	Population (individual)		
		Included in the project		
		Total	Among them:	
			Men	Women
Alat	28 370	28 370	14 084	14 286
Gijduvan	67 093	67 093	34 832	32 261
Karakul	34 018	34 018	16 862	17 156
Karaulbazar**	11 381	11 381	5 687	5 694
Ramitan	**29 057**	**29 057**	**14 576**	**14 481**
Total	169 919	169 919	86 041	83 878

*Data is indicated in the mahalla passports.
**Karaulbazar d/c population data provided by Bukhara Regional Statistics Department, as of 1st January 2024.

7.2.2 Gender and age structure

The gender and age structure of the population of the five district centres is as follows: the population younger than the working age made up 57,124; the population of the working age – 76,930; the

population older than the working age – 22,007. (Table 7.4 Gender and age structure of district centres in the context of local mahallas included in the project

Name of district centre/mahalla	Population*		
	Younger than the working age	The working age	Older than the working age
Alat			
MSG Khalifa	1,048	3,131	398
MSG Bunyodkor	310	1,249	264
MSG Navruz	652	1,090	198
MSG Eski Olot	692	995	233
MSG Ma'rifat	575	1,005	282
MSG Khalkobod	429	953	139
MSG Ok Oltin	884	1,034	229
MSG Jayhunabad	1,075	1,705	228
MSG Asajam	786	2,168	269
MSG Solo Karaul	1,388	2,098	385
Gijduvan			
MSG Chorsu	1,064	2,255	481
MSG Sardor	1,167	1,022	261
MSG Kurgon	1,168	993	254
MSG A.Gijduvoniy	746	1,441	387
MSG Dilkusho	1,137	1,352	279
MSG F.Hujaev	952	3,073	594
MSG Shark	3,220	3,330	750
MSG A.Kahhor	571	2,116	358
MSG Pomuza	1,459	2,309	458
MSG Guliston	511	1,833	486
MSG Bobur	836	3,019	790
MSG Galaba	1,640	852	342
MSG Nodirabegim	1,045	1,678	347
MSG Degrezon	1,053	1,164	298
MSG Gulistonobod	2,276	2,519	936
MSG Havzak	1,833	1,929	584
MSG Mustakillik	1,457	1,638	365
MSG Pozagari	1,023	1,647	487
Karakul			
MSG Eski Kal'a	836	2,578	552
MSG Paxtakor	935	1,450	499
MSG Zarafshon	1,628	1,085	415
MSG Chekirchi	1,822	1,025	784
MSG Dustlik	960	1,207	1,395
MSG Tinchlik	798	1,320	1,677
MSG Taykir	1,676	1,379	155

MSG Regi Haydar	1,927	1,860	173
Karaulbazar			
MSG Chulkuvar	662	1,376	1,078
MSG Tinchlik	2,834	1,475	1,508
Ramitan			
MSG A.Navoiy	1,250	1,231	299
MSG Gulistan	1,104	1,043	324
MSG Afrasiyob	935	1,043	220
MSG Ibn Sino	418	1,128	279
MSG Zarafshan	1,443	1,711	450
MSG Bobur	1,260	967	290
MSG Ramitan	836	684	160
MSG Bogcha	2,022	1,720	134
MSG Tarnaut	2,781	3,050	533
Total for project area	57,124	76,930	22,007

** - Source: passports of MSG of the project area as of 1 January 2023*

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Table 7.4 Gender and age structure of district centres in the context of local mahallas included in the project

Name of district centre/mahalla	Population*		
	Younger than the working age	The working age	Older than the working age
Alat			
MSG Khalifa	1,048	3,131	398
MSG Bunyodkor	310	1,249	264
MSG Navruz	652	1,090	198
MSG Eski Olot	692	995	233
MSG Ma'rifat	575	1,005	282
MSG Khalkobod	429	953	139
MSG Ok Oltin	884	1,034	229
MSG Jayhunabad	1,075	1,705	228
MSG Asajam	786	2,168	269
MSG Solo Karaul	1,388	2,098	385
Gijduvan			
MSG Chorsu	1,064	2,255	481
MSG Sardor	1,167	1,022	261
MSG Kurgon	1,168	993	254
MSG A.Gijduvoniy	746	1,441	387
MSG Dilkusho	1,137	1,352	279
MSG F.Hujaev	952	3,073	594
MSG Shark	3,220	3,330	750
MSG A.Kahhor	571	2,116	358
MSG Pomuza	1,459	2,309	458

MSG Guliston	511	1,833	486
MSG Bobur	836	3,019	790
MSG Galaba	1,640	852	342
MSG Nodirabegim	1,045	1,678	347
MSG Degrezon	1,053	1,164	298
MSG Gulistonobod	2,276	2,519	936
MSG Havzak	1,833	1,929	584
MSG Mustakillik	1,457	1,638	365
MSG Pozagari	1,023	1,647	487
Karakul			
MSG Eski Kal'a	836	2,578	552
MSG Paxtakor	935	1,450	499
MSG Zarafshon	1,628	1,085	415
MSG Chekirchi	1,822	1,025	784
MSG Dustlik	960	1,207	1,395
MSG Tinchlik	798	1,320	1,677
MSG Taykir	1,676	1,379	155
MSG Regi Haydar	1,927	1,860	173
Karaulbazar			
MSG Chulkuvar	662	1,376	1,078
MSG Tinchlik	2,834	1,475	1,508
Ramitan			
MSG A.Navoiy	1,250	1,231	299
MSG Gulistan	1,104	1,043	324
MSG Afrasiyob	935	1,043	220
MSG Ibn Sino	418	1,128	279
MSG Zarafshan	1,443	1,711	450
MSG Bobur	1,260	967	290
MSG Ramitan	836	684	160
MSG Bogcha	2,022	1,720	134
MSG Tarnaut	2,781	3,050	533
Total for project area	57,124	76,930	22,007

** - Source: passports of MSG of the project area as of 1 January 2023*

7.2.3 Birth rate

The fertility rate in the overall project area (except for the Gijduvan district at 25.8‰) is lower than the Bukhara Region average rate of 24.9 per 1000 population and according to a comparison of the Republic of Uzbekistan, this indicator is also lower than the average birth rate in the Republic in 2023 (25.9 ‰). The highest birth rate in the project area in 2023 is Gijduvan at 25.8 per thousand (‰). Ramitan had the second lowest birth rate in 2023 above Karaulbazar at 19.8‰ (2023).

Table 7.5. The fertility rate in the project area in the view of 2015-2023

*Fertility rate per 1000 population - ‰**

Regions	2015	2016	2017	2018	2019	2020	2021	2022	2023
The Republic of Uzbekistan	**20.5**	**20.6**	**19.8**	**21.2**	**22.3**	**22.7**	**23.9**	**26**	**25.9**
Bukhara Region	**17.9**	**18.1**	**17.8**	**19**	**20**	**19.8**	**22.9**	**27.4**	**24.9**
Alat	11	11	14.8	13.8	13.9	20.7	21.9	24.4	24.8
Gijduvan	20.7	22.4	20.2	21.8	21.6	22.5	28.5	28.5	25.8
Karakul	17.1	21	21.2	23.3	23.6	22.1	25.3	24.2	24.3
Karaulbazar	14.4	15	16.3	17.6	21.5	20.1	24.9	23.3	19.8
Ramitan	**17.3**	**17.3**	**19.5**	**18.2**	**21**	**19.7**	**23.6**	**25.5**	**21**

7.2.4 Mortality

The mortality rate in the overall project area (per 1000 population) is below the average rate for the Republic of Uzbekistan at 4.7 per 1000 population. The average mortality rate in the Bukhara Region is 4.3‰. The analysis for year by year shows that the mortality rate in the Ramitan district is lower in 2023 (4‰) compared to 2016 (5‰).

Table 7.6. The mortality rate in the project area in the view of 2016-2023

Mortality rate per 1000 population – ‰								
Regions	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
The Republic of Uzbekistan	**4.9**	**5**	**4.7**	**4.6**	**5.1**	**5**	**4.8**	**4.7**
Bukhara Region	**4.4**	**4.5**	**4.2**	**4.4**	**5.2**	**4.7**	**4.5**	**4.3**
Alat	4.3	4.7	4	4.7	4.8	4.7	4.4	4.5
Gijduvan	3.9	3.9	3.8	3.9	4.9	4.2	3.7	3.6
Karakul	4.2	4.2	4.3	4.1	5	4.5	4.1	3.7
Karaulbazar	4.6	4.6	4.5	4.3	5.2	5.1	4.7	4.2
Ramitan	**5**	**5.2**	**4.4**	**4.8**	**5.5**	**5**	**3.4**	**4**

7.2.5 Structure of households by number of children

Table 7.7. Structure of households by the number of members in the Republic of Uzbekistan based on the results of a sample households survey, in % (2000-2022).

Indicator	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018	2020	2022
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
1 person	3.9	4.7	4.0	4.0	3.6	2.9	3.1	2.4	2.5	2.4	3.1	2.7
2 persons	7.1	8.7	6.7	7.0	6.1	5.9	6.7	5.0	5.4	5.4	5.5	6.7
3 persons	9.8	9.7	10.5	11.7	9.8	9.4	11.5	9.6	10.0	10.1	10.2	11.0
4 persons	16.1	17.3	18.1	18.2	19.3	18.3	19.8	18.8	19.1	19.9	19.5	18.5
5 persons and more	**63.2**	**59.6**	**60.7**	**59.1**	**61.2**	**63.6**	**58.9**	**64.2**	**63.0**	**62.2**	**61.7**	**61.1**

A sizeable majority of people are currently living in households of 5 persons and more - 61.1% in 2022.

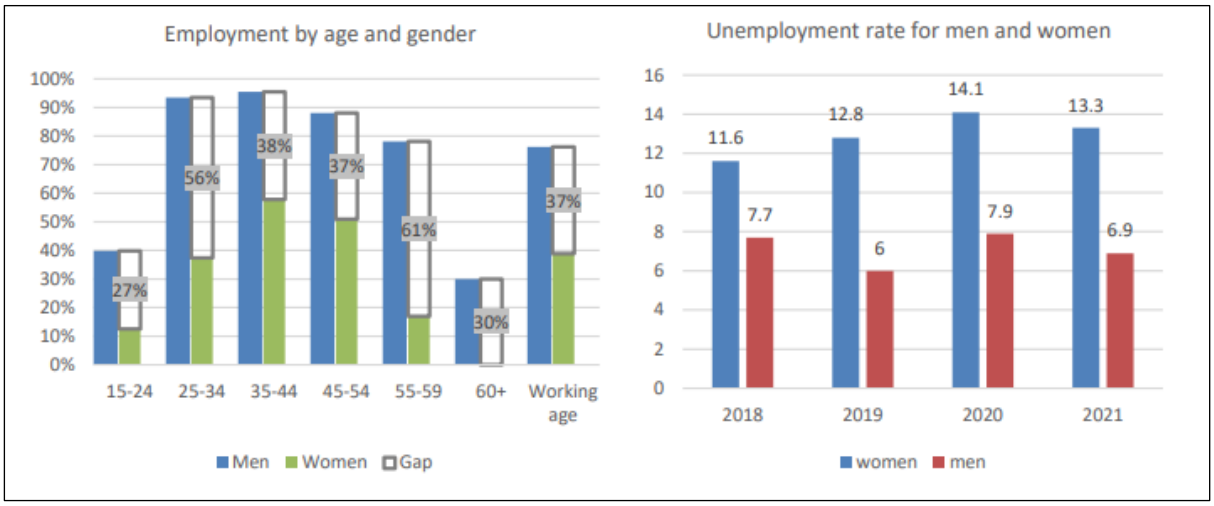
7.3 Gender Equality

The World Bank's Country Gender Assessment (CGA) for Uzbekistan[21] (May 2024) examines gender equality in Uzbekistan across several domains, including education, health, economic activity, protection from gender-based violence (GBV), marriage, divorce, and participation in public life. This assessment report recognised Uzbekistan as one of the top five improvers in gender equality in 2024 with women's access to education and health services notably improved. Statistics and data in relation to two gender equality domains - economic activity and gender-based violence (GBV) - are reviewed below.

7.3.1 Economic Activity

According to the World Bank CGA (2024), a high share of youth struggle to enter the labor force (or obtain further education), especially young women. The share of young men who were not in employment and not in education or in training (NEET) was 8.8% between the ages of 15 and 25 yrs old, compared to 42% among women of that age group. Employment/unemployment rates by age and gender are illustrated in Figure 7.1[22] below.

Figure 7.1. Employment/Unemployment by Age and Gender



In addition, the World Bank CGA in 2024 states that '*men earned 34% more than women in Uzbekistan on average in 2022'.*

7.3.2 Protection from Gender-based Violence (GBV)

Gender based violence (GBV) is a global problem, affecting women across the world impacting on their sense of agency and overall well-being, both physical and mental. The incidence of gender-based violence (GBV) is unknown in Uzbekistan due to a lack of representative survey data and underreporting, but it is believed to be highly prevalent[23].

According to the World Bank, in 2022, almost 38,000 protection orders were issued in Uzbekistan in relation to violent cases, up from 30,000 orders in 2021; and approximately 90% of protection orders were requested by family members against other family members.

[21] World Bank Country Gender Assessment Report: Uzbekistan (2024)

[22] World Bank estimates based on Household Budget Survey of Uzbekistan, 2022 (left) and Agency on Statistics, 2021(right).

[23] CDAW (2015), cited in World Bank CGA Report for Uzbekistan, 2024, page 9.

7.4 Public health

As of 2023, 118 hospitals operate in the Bukhara Region, including 2 hospitals in Alat, 15 hospitals in Gijduvan, 4 hospitals in Karakul, 8 hospitals in Karaulbazar, and **3 hospitals in Ramitan.** Additionally, 549 outpatient-polyclinic clinics are operational across the region, with 19 clinics in Alat, 65 clinics in Gijduvan, 31 clinics in Karakul, 7 clinics in Karaulbazar, and **28 clinics in Ramitan.** The number of hospital beds has increased to 9,324 beds in the region in 2023, with 826 beds in Gijduvan, 327 beds in Karakul, 242 beds in Alat, 86 beds in Karaulbazar, and **328 beds in Ramitan**. The healthcare sector employs 8.8 thousand medical professionals, including 1,250 doctors and 7,550 nursing staff. Additionally, the average number of medical workers per district is as follows: 1.3 thousand in Alat, 3.1 thousand in Gijduvan, 2.0 thousand in Karakul, 0.4 thousand in Karaulbazar, **and 1.7 thousand in Ramitan.** All existing medical institutions in the Bukhara Region, including all 11 family polyclinics in Bukhara city, are fully connected to fibre-optic internet, and the electronic queue system (Teshnomed) is operational in the medical associations and family polyclinics in Karakul and Gijduvan districts.

Table 7.8. Number of hospital facilities operating in the project areas of Bukhara Region (units), 2017-2023

	2017	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*
Bukhara region	**79**	**81**	**82**	**89**	**90**	**95**	**118**
Alat	1	1	1	2	2	2	2
Gijduvan	15	16	15	10	11	11	15
Karakul	3	2	3	3	2	4	4
Karaulbazar	7	7	6	4	4	4	8
Ramitan	**3**	**3**	**3**	**4**	**3**	**3**	**3**

Table 7.9. Number of outpatient-polyclinic clinics operating in the project areas (2010-2021)

	2010	*2012*	*2014*	*2016*	*2018*	*2020*	*2021*
Bukhara region	***523***	***544***	***506***	***567***	***486***	***531***	***549***
Alat	26	27	23	25	18	18	19
Gijduvan	66	74	63	68	55	60	65
Karakul	41	43	38	42	27	31	31
Karaulbazar	6	6	5	8	6	7	7
Ramitan	**37**	**38**	**36**	**37**	**30**	**29**	**28**

Table 7.10. Number of medical workers in Bukhara region (2017-2023)

	2017	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*
Number of medical workers in Bukhara region in project areas (ths. people)							
Bukhara region	**27.9**	**29.5**	**30.2**	**30.2**	**30.5**	**31.1**	**32.6**
Alat	1.4	1.5	1.4	1.4	1.5	1.3	1.3
Gijduvan	2.8	3.2	3.0	3.0	3.0	2.7	3.1
Karakul	2.2	2.2	2.2	2.2	2.1	1.9	2.0
Karaulbazar	0.3	0.3	0.3	0.3	0.4	0.3	0.4
Ramitan	**1.8**	**1.9**	**1.9**	**1.7**	**1.8**	**1.7**	**1.7**
Number of doctors in Bukhara region in project areas (ths. people)							
Bukhara region	**5.4**	**5.8**	**5.9**	**6.0**	**6.2**	**6.5**	**7.5**

	2017	2018	2019	2020	2021	2022	2023
Alat	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Gijduvan	0.4	0.5	0.5	0.5	0.5	0.4	0.6
Karakul	0.3	0.3	0.3	0.3	0.3	0.3	0.4
Karaulbazar	0.06	0.05	0.05	0.05	0.06	0.06	0.07
Ramitan	**0.2**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.3**
Number of average medical workers in design areas in Bukhara region (ths. people)							
Bukhara region	**22.5**	**23.7**	**24.3**	**24.1**	**24.3**	**24.6**	**25**
Alat	1.2	1.3	1.2	1.2	1.3	1.2	1.1
Gijduvan	2.4	2.7	2.5	2.5	2.5	2.3	2.5
Karakul	1.9	1.9	1.9	1.9	1.9	1.6	1.6
Karaulbazar	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Ramitan	**1.6**	**1.6**	**1.6**	**1.4**	**1.5**	**1.5**	**1.4**

Table 7.11 Number of beds (units) of hospital facilities (2017-2023)

Number of beds (units) of hospital facilities acting in project areas in Bukhara region							
	2017	2018	2019	2020	2021	2022	2023
Bukhara region	**7,058**	**8,342**	**7,379**	**7,644**	**8,524**	**9,162**	**9,324**
Alat	192	200	189	197	197	214	242
Gijduvan	719	734	628	649	623	747	826
Karakul	322	327	588	613	618	322	327
Karaulbazar	86	86	86	94	94	86	86
Ramitan	**333**	**328**	**328**	**353**	**333**	**333**	**328**

7.5 Migration

Migration issues have their own peculiarities in the Bukhara region. While the share of the population participating in migration is significantly lower than the share of the population participating in temporary labor migration. In the project areas, migration cases look like this. According to the results of 2023, the number of people who left the Bukhara region made up only 11,316, among them 3,712 people were in the project areas, in particular, 1,750 people from the Gijduvan district, 874 people from the Karakul district, 417 people from the Alat district, **430 people from the Ramitan district** and 241 people from the Karaulbazar district. The analysis in the view of years shows that the number of dropouts in 2020 was the highest in comparison with the previous years from 2016 and in the following years up to 2023. And as for those who arrived in the region, the situation there is not consistently high in terms of the ratio of those who leave the region. Detailed indicators are provided in Table 7.12 below.

Table 7.12 Number of those who left and arrived in the project areas of the Bukhara region (2016-2023)

The number of those who left								
Regions	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Bukhara Region	**7,967**	**9,037**	**8,766**	**9,265**	**13,350**	**10,991**	**9,273**	**11,316**
Alat	335	436	337	347	662	480	377	417
Gijduvan	1,529	1,644	1,467	1,595	2,179	1,708	1344	1,750
Karakul	396	471	585	737	1,734	992	770	874
Karaulbazar	173	196	180	146	163	210	183	241
Ramitan	**261**	**281**	**384**	**351**	**414**	**427**	**359**	**430**

The number of those who arrived								
Regions	***2016***	***2017***	***2018***	***2019***	***2020***	***2021***	***2022***	***2023***
Bukhara region	**5,994**	**6,783**	**6,091**	**5,584**	**4,873**	**6,672**	**6236**	**7,797**
Alat	222	191	278	230	138	148	127	129
Gijduvan	1,347	999	772	505	563	595	617	667
Karakul	272	555	464	210	69	158	162	172
Karaulbazar	190	267	53	81	48	371	262	331
Ramitan	**172**	**337**	**213**	**173**	**506**	**222**	**243**	**371**

7.6 Living standards

7.6.1 Total Income per capita

Table 7.13 sets out total income per capita by region in thousand soums. For 2000-2009 monetary income is given, total income is included from 2010 onwards with updated data from 2010.

Table 7.13. Income per Capita (2000-2022), 000s Soums

Regions	2000	2006	2010	2016	2018	2020	2022
The Republic of Uzbekistan	**96.4**	**489.1**	**2,192.8**	**6,215.9**	**9,128.6**	**12,122.2**	**17,807.3**
The Republic of Karakalpakstan	60.6	289.7	1,498.9	4,372.0	6,808.7	9,436.6	13,253.4
Andijan	111.2	426.4	1,838.1	5,637.3	8,412.0	10,765.9	15,727.3
Bukhara	***87.6***	***466.2***	***2,524.4***	***7,354.2***	***11,270.6***	***14,675.5***	***21,382.0***
Djizakh	54.2	312.4	1,810.7	5,459.4	8,512.9	10,951.7	15,221.2
Kashkadarya	72.4	351.2	1,896.4	5,498.4	7,827.9	10,199.0	14,678.9
Navoi	117.7	731.4	3,881.6	9,745.0	13,921.4	19,922.5	27,420.4
Namangan	65.3	329.6	1,566.7	4,745.5	6,887.6	9,258.8	13,880.7
Samarkand	74.7	313.9	2,029.0	5,603.4	8,087.7	10,522.8	15,534.2
Surhandarya	66.2	385.8	1,718.4	5,079.8	7,622.5	9,745.0	14,597.2
Syrdarya	75.2	374.7	2,215.1	6,772.1	8,353.5	10,938.3	15,124.1
Tashkent	91.2	486.9	2,433.3	6,749.9	9,401.6	13,129.4	18,129.4
Fergana	105.5	388.6	1,723.0	4,994.1	7,096.8	8,853.5	13,607.9
Khorezm	73.6	368.2	2,105.3	5,840.3	9,536.1	12,270.6	19,643.5
Tashkent city	244.3	1,619.8	4,505.9	1,2316.1	18,432.1	25,543.6	37,518.0

7.6.2 Socio-economic situation in the Republic of Uzbekistan (for January-December 2022)

Gross domestic product (GDP)

According to preliminary data, the GDP of the Republic of Uzbekistan for January-December 2024 grew by **6.5%** relative to the corresponding period of 2023.

The economy of Uzbekistan grew by **6.5%** in 2024, and the gross domestic product amounted to 1 quadrillion 454 trillion soums or 114.9 billion dollars. GDP per capita reached 39.1 million soums or **3,093** dollars.

Last year, GDP per capita in current prices amounted to 39 million 131 thousand soums or 3,092.7 dollars. In real terms, it grew by **4.4%** compared to 2023 and by **19.5%** compared to 2020.

Compared to 2023, the share of the service sector in the GDP structure increased from 46.2% to 47.4%, industry - from **25.3%** to **26.4%.** The share of agriculture, forestry and fisheries decreased from 21.2% to 19.2%, and construction - from 7.3% to 7%.

Table 7.14 Composition of the gross territorial product of the Bukhara region

The composition of the gross territorial product of the Bukhara region by types of economic activity (as a percentage of the total volume)									
	2010	**2012**	**2014**	**2016**	**2018**	**2020**	**2022**	**2023**	**2024**
I. GDP, total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Sector gross value added	90.1	91.3	93.0	93.3	93.8	96.7	95.6	94.8	97.8
Net taxes on product	9.9	8.7	7.0	6.7	6.2	3.3	4.4	5.2	2.2
II. Sector gross value added	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Agriculture, forestry and fisheries	**39.1**	**42.8**	**45.2**	**44.7**	**48.7**	**46.2**	**44.7**	**26.8**	**35.0**
Industry (construction holding)	**30.7**	**23.4**	**21.0**	**21.6**	**20.6**	**24.8**	**26.2**	**31.7**	**29.8**
Industry	15.2	13.7	13.2	14.3	12.9	16.8	18.0	22.7	19.9
Construction	15.5	9.7	7.8	7.3	7.7	8.0	8.2	9.0	9.9
Services	***30.2***	***33.8***	***33.8***	***33.7***	***30.7***	***29.0***	***29.1***	***41.5***	**35.2**
trade, accommodation and catering services	5.2	6.6	7.3	8.1	7.3	7.2	7.5	10.7	13.2
transportation and storage, information and communication	5.9	7.5	6.9	7.5	6.3	5.2	5.4	7.8	5.6
other service sectors	19.1	19.7	19.6	18.1	17.1	16.6	16.2	23.0	16.4

7.6.3 Employment of population

Table 7.15. Employment levels, 2023

Labor resources and employment of the population in the project area for 2023					
Quantity					
	Labor sources	Economically active population		Employed in economic sectors	
Bukhara Region	**1,089.2**	**858.8**	**78.9%**	**803.2**	**73.7%**
Ramitan	76.3	63.3	83%	50.3	79.4%

Table 7.16. Unemployment levels (2023)

District centre	Economically active population	including		Unemployment level
		Employed in economic sectors	Unemployed	
2023				
Alat	43.3	40.4	2.9	6.7
Gijduvan	130.5	119.2	11.3	8.7
Karakul	71.0	64.4	6.6	9.2
Karaulbazar	17.8	16.3	1.5	8.6
Ramitan	62.9	57.2	5.7	9.1

Table 7.17. Labor market (2017-2023), 1000s People

Labor market in Bukhara Region							
Indicators	***2017***	***2018***	***2019***	***2020***	***2021***	***2022***	***2023***
Employed (ths. people)							
Economically active population	874.6	887.7	875.4	881.9	862.2	860.6	858.8
Including the employed	826.5	810.1	797.1	788.0	777.3	784.5	803.2
Including sectors of the economy							
Agriculture, forestry and fisheries	254.8	252.1	245.2	250.3	231.5	227.5	228.8
Industry	108.1	103.1	101.7	92.9	99.7	92.3	95.9
Construction	125.3	114.9	118.3	115.6	102.7	99.4	110.1
Trade	81.7	76.3	77.9	73.8	73.0	70.4	73.5
Transportation services	48.3	46.3	44.1	42.0	42.3	40.5	40.4
Education	64.1	64.2	63.2	66.9	71.7	72.6	75.9
Health and social services	40.6	40.7	39.7	44.2	40.5	39.9	40.2
Others	103.6	112.5	107.0	102.3	115.9	141.9	138.4
Distribution of the employed population by property type							
Public sector	138.6	144.3	143.8	142.2	382.4	427.2	436.0
Non-governmental sector	687.9	665.8	653.3	645.8	394.9	357.3	367.2
Unemployed registered in the labor authorities	0.8	1.1	3.6	3.1	3.7	6.4	6.4

7.7 Social Infrastructure

Existing social infrastructure provision in the Project area is examined including pre-primary education (units and pupils), general educational institutions (no. of teaching staff, etc.), and the number of healthcare centres.

7.7.1 Education

Table 7.18. Pre-primary education (2017-2023)

Number of pre-primary recommended education (at the end of the year, unit)							
	2017	***2018***	***2019***	***2020***	***2021***	***2022***	***2023***
Bukhara region	**343**	**414**	**482**	**515**	**566**	**593**	**2077**
Alat	7	9	13	13	22	29	93
Gijduvan	52	64	64	71	76	77	419
Karakul	20	29	12	13	47	50	152
Karaulbazar	9	9	34	37	10	11	17
Ramitan	**27**	**32**	**43**	**44**	**43**	**43**	**183**
Number of pupils (at the end of the year, people)							
	2017	***2018***	***2019***	***2020***	***2021***	***2022***	***2023***
Bukhara region	**40,105**	**56,255**	**67,260**	**75,620**	**80,934**	**85,563**	**127,246**
Alat	635	1,295	1,405	1,883	2,966	3,825	5,460
Gijduvan	5,101	8,688	10,982	11,756	12,453	12,003	21,037
Karakul	895	2,593	1,622	1,822	5,260	6,304	11,086
Karaulbazar	1,600	1,432	3,728	4,126	1,475	1,558	1,748

Ramitan	**2,539**	**4,230**	**4,658**	**5,226**	**6,516**	**67,91**	**10,421**

Table 7.19. General education institutions (2017/18 - 2023/2024)

Number of general education institutions (at the beginning of the academic year, units)							
	2017/ 18	***2018/ 19***	***2019/ 20***	***2020/ 21***	***2021/ 22***	***2022/ 23***	***2023/24***
Bukhara Region	**536**	**539**	**548**	**551**	**563**	**577**	**583**
Alat	36	35	35	37	37	39	38
Gijduvan	66	66	68	68	73	74	75
Karakul	53	53	54	54	54	56	57
Karaulbazar	8	8	8	8	8	9	8
Ramitan	**44**	**44**	**44**	**44**	**45**	**45**	**45**
Number of pupils (at the end of the year, people)							
	2017/ 18	***2018/ 19***	***2019/ 20***	***2020/ 21***	***2021/ 22***	***2022/ 23***	***2023/24***
Bukhara Region	**284,113**	**313,558**	**327,139**	**332,865**	**326,549**	**331,615**	**337,685**
Alat	16,222	17,624	18,018	18,281	17,052	17,305	17,299
Gijduvan	47,416	52,333	53,212	53,665	53,229	53,860	54,322
Karakul	25,100	27,289	28,306	28,633	27,507	28,178	28,623
Karaulbazar	3,359	3,693	3,993	4,092	3,955	4,060	4,122
Ramitan	**20,504**	**22,507**	**23,477**	**23,779**	**23,540**	**23,909**	**24,607**
Number of teaching staff (at the end of the year, out of job)							
	2017/ 18	***2018/ 19***	***2019/ 20***	***2020/ 21***	***2021/ 22***	***2022/ 23***	***2023/24***
Bukhara Region	**24,395**	**25,942**	**27,983**	**28,900**	**29,109**	**29,910**	**30,930**
Alat	1,521	1,545	1,637	1,709	1,690	1,661	1,748
Gijduvan	3,585	3,886	4,206	4,377	4,347	4,402	4,545
Karakul	2,700	2,742	2,771	2,852	2,810	2,885	2,960
Karaulbazar	312	342	375	386	399	404	407
Ramitan	**1,627**	**1,756**	**1,880**	**1,920**	**2,010**	**2,054**	**2,143**

7.7.2 Healthcare centres

Table 7.20. Number of healthcare centres operating in the project areas of the Bukhara Region (units)

	2018	2019	2020	2021	2022	2023	2024- I-IX)
Bukhara region	**6,631.6**	**8,413.2**	**9,843.1**	**12,574.1**	**15,848.8**	**19,294.1**	**23,781.7**
Alat	169.4	325.4	375.0	446.2	526.3	635.2	534.9
Gijduvan	717.7	1,143.7	1,301.1	1,684.4	1,937.6	2,311.5	1,950.2
Karakul	202.0	392.1	438.6	548.9	699.6	842.8	714.8
Karaulbazar	128.1	152.4	196.7	238.9	314.7	400.1	322.7
Ramitan	**219.3**	**463.2**	**517.2**	**690.8**	**883.3**	**1,071.6**	**913.3**

7.8 Engineering infrastructure

7.8.1 Water supply

For several years the Republic of Uzbekistan has been pursuing a policy of providing the population with safe drinking water services. As of 2022, the share of households using at least basic drinking water services in urban areas was 98.7% of all urban households. The share of households using at least basic drinking water services in rural areas is 96.8% of all rural households in the republic.

Table 7.21. Proportion of households using safe drinking water (2005-2023)

Indicator	2005	2010	2015	2020	2021	2022	2023
Proportion of households using at least basic drinking water services, urban areas (% urban households)	89.1	91.4	94.7	92.6	95.8	98.7	99.1
Proportion of households using at least basic drinking water services, rural areas (% of rural households)	54.5	60.5	85.7	82.7	93.6	96.8	97.3
Proportion of households using at least basic drinking water services (% of households)	68.9	73.4	90.4	87.9	94.7	97.8	98.4
Proportion of households using safe drinking water services, urban areas (% urban households)	97.2	97.7	99.4	98.7	98.8	99.6	99.6
Proportion of households using safe drinking water services, rural areas (% of rural households)	82.8	89.4	96.9	98.8	98.3	98.8	99.1
Proportion of households using safe drinking water services (% of households)	88.8	92.9	98.2	98.7	98.5	99.2	99.3

7.8.2 Wastewater

Some of project district centers of the Bukhara region have a centralised sewerage system only in some micro districts (makhallas) but most of other micro districts do not have a centralised sewerage system at all.

7.8.3 Communication services

The sphere of communication is of great importance in the modern world. Over the past decades, the structure of communication services has changed dramatically in the direction of ICT. We cannot imagine our modern life without the Internet, cellular communications. As in the whole world, in Uzbekistan, too, such a trend is observed. An analysis by year shows that, instead of traditional areas of communication, modern spheres of communication services, in particular the Internet and cellular communications have begun to play an increasingly important role. For example, in 2000, the share of the Internet in the Bukhara region was only 0.4%, then this figure was already 34.1% by 2021.

Accordingly, some service sectors lost their positions, for example, the urban and rural telephone network fell from 15.4 to 1%, as well as the long-distance and international telephone network fell from 31.1% to 12.4%.

Table 7.22. Indicators for communication services in Bukhara Region %

Structure of revenue of communication enterprises from communication services/in percentages of the total								
№	**Indicators**	**Unit of measurement**	**2010**	**2015**	**2020**	**2021**	**2022**	**2023**
1	Communication - total	в %	100	100	100	100	100	100
2	postal	в %	1.4	1.3	0.80	1.08	0.90	0.002
3	telegraph	в %	0.03	0.02	0.003	0.004	0.002	0.002
4	long-distance and international telephone	в %	2.4	0.9	0.04	0.03	0.02	0.01
5	urban and rural telephone	в %	3	1.6	1.10	0.76	0.48	0.32
6	mobile	в %	88.6	72	55.10	51.83	49.82	34.21
7	data transmission network, including the Internet	в %	4.6	23.7	41.70	44.96	47.35	63.43
8	transmission and reception of television programs	в %	0.03	0.4	1.30	1.33	1.21	1.33
9	other types of communication	в %	0	0.03	0.000001	0	0.23	0.70

7.9 Economy

7.9.1 Trade

As of July 1, 2024, the number of commercial enterprises operating in the retail trade sector in Uzbekistan reached 88,541 units, of which the number of operating large enterprises was 324 units, and small enterprises and microfirms - 88,217.

In January-June 2024, according to the Statistics Agency of Uzbekistan, the volume of retail turnover amounted to 154.62 trillion soums, which is 8.4% higher compared to the same period in 2023.

The turnover of large enterprises amounted to 27.79 trillion soums (growth rate - 9.4%), and small businesses and private entrepreneurship - 126.82 trillion soums (growth rate - 8.2%), including unorganized trade amounted to 16.68 trillion soums (growth rate - 14.1%).

The retail trade turnover of small businesses and private entrepreneurship, according to statistical calculations, in January-June 2024 amounted to 126.82 trillion soums and, compared to the same period in 2023, increased by 8.2%. The share of this sector in the republic in the retail turnover reached 82.0%.

In the structure of retail turnover, the turnover of large enterprises in January-June 2024, compared to the corresponding period in 2023, increased by 14.0% and reached 27.79 trillion soums, which is 18.0% of its total volume.

The retail turnover per capita in the republic for January-June 2024 averaged 4.18 million soums (compared to the same period in 2023, it increased by 6.2%).

The turnover of wholesale and retail trade in motor vehicles and their accessories (except for maintenance and repair of motor vehicles) for January-June 2024 amounted to 54.08 trillion soums and increased by 18.5% compared to the same period in 2023. The turnover of large enterprises amounted

to 21.15 trillion soums (growth rate -48.4%), and small businesses and private entrepreneurship - 32.93 trillion soums (growth rate -5.0%).

According to preliminary data, in January-June 2024, the volume of wholesale turnover reached 147.01 trillion soums and, compared to the same period in 2023, increased by 10.6%.

Table 7.23. Main indicators of wholesale trade organizations of the Bukhara Region (2012-2024)

	2012	2014	2016	2018	2020	2022	2023	2024
Wholesale turnover- total, billion soum	**18 018,9**	**26 749,1**	**2 104,3**	**1949,1**	**4 442,1**	**13 722,5**	**13 747,5**	**18 023,9**
Inventories (at the end of the year):	191,0	306,3	440,7	647,8	828,2	714,0	1 048,5	
Turnover by days	12,8	16,4	23,7	32,5	52,4	44,0	-	
Growth rates of wholesale trade turnover as a percentage compared to preceding year	102,4	111,0	116,5	105,0	121,0	170,3	92,8	106,5

Table 7.24. Growth rates of retail turnover by project districts (%)

The growth rate of the volume of retail trade turnover in the districts of the Bukhara Region (as a percentage/& of the preceding year)							
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**I-IX - 2024**
Bukhara Region:	**108.2**	**107.7**	**102.6**	**109.3**	**108.0**	**106.2**	**108.3**
Alat	104.0	111.4	101.7	115.9	102.1	118.4	107.9
Gijduvan	102.7	112.9	102.7	116.7	106.3	106.3	106.8
Karakul	105.6	79.8	100.4	101.2	102.9	105.2	105.4
Karaulbazar	107.5	108.4	111.9	101.5	104.2	105.8	105.7
Ramitan	**96.1**	**113.7**	**100.2**	**115.4**	**105.8**	**107.1**	**107.0**

In the Republic of Uzbekistan, the overall retail trade turnover in January-December 2023 reached 359,298.1 billion soums, an increase by 12.5% compared to the same period in 2022, and the trade turnover of large enterprises amounted to 74,154.1 billion soums (increase rate is 12.8%), and small business and private entrepreneurship - 285,143.8 billion soums (increase rate is 12.5%), including unorganised trade amounting to 28,904.1 billion soums (increase rate is 11.3%).

Over the past six years (2019–2024), high growth rates of retail trade turnover in the Bukhara region were noted in 2023 and 2024. In 2023, the total retail trade turnover for the Bukhara region amounted to 18,167.1 billion soums, marking an increase of 19.1% compared to the previous year (15,522.0 billion soums in 2022. Details on retail turnover in the project districts can be found in Table 7.25.

Table 7.25. The volume of retail turnover by project district (Billion soums)

The volume of retail turnover by project districts (at current prices; billion soums)							
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**I-IX - 2024**
Bukhara Region	**8,375.1**	**10,309.2**	**12,072.8**	**14,605.3**	**15,522.0**	**18,167.1**	**14,359.3**
Alat	203.6	259.3	263.8	338.4	345.6	450.6	363.8

Gijduvan	1,374.3	1,774.5	2,189.1	2,827.2	2,952.4	3,457.7	2,555.2
Karakul	907.4	828.2	901.2	1,009.8	1,141.8	1,323.7	1,041.7
Karaulbazar	135.8	168.2	258.3	290.3	318.6	371.3	294.9
Ramitan	**498.6**	**647.8**	**727.0**	**928.8**	**1,035.4**	**1,221.9**	**761.0**

7.9.2 Industry

By type of industrial products, one can observe their more or less even distribution over the districts, except for the production of coke and refined petroleum products of which the Karaulbazar oil refinery has been overtaking, which accounts for 99.5% of this kind of products. The Gijduvan district occupies one of the leading places in the Bukhara region in the areas of production of paper and paper products (35.9%), production of chemical products (15.2%) and textile products (22.2%). In the Karakul district the production of electrical equipment is 32.4%, and the Ramitan district occupies the leading role in the Bukhara region for the manufacture of furniture and production of wood products and cork products (except furniture), materials for sewing and weaving, 37.3% and 33.4%, respectively.

Table 7.26. Share of project areas in the structure of the manufacturing industry (2024), %

The share of districts in the manufacturing industry in the region in January-September 2024, %					
	Alat	Gijduvan	**Karakul**	Karaulbazar	Ramitan
Industry	**1.5**	**7.6**	**4.3**	**46.8**	**4.8**
Food production	2.7	12.5	5.4	2.4	**6.6**
Beverage production	0.0	2.4	0.0	0.3	**3.6**
Textile production	3.0	21.9	15.9	2.4	**15.9**
Apparel production	3.8	10.5	4.7	1.0	**5.0**
Production of leather and related products	0.5	10.9	0.9	0.0	**0.4**
Manufacture of wood products and cork products (except furniture), materials for sewing and weaving	0.0	2.2	0.3	0.0	**0.2**
Manufacture of paper and paper products	0.1	21.3	0.1	0.0	**0.3**
Publication and reflection of written materials	0.0	5.9	0.0	0.0	**0.0**
Production of coke and refined petroleum products	0.0	0.0	0.1	99.9	**0.0**
Production of chemical products	0.0	10.8	0.1	0.0	**0.2**
Production of basic pharmaceuticals and preparations	13.5	0.0	0.0	0.0	**11.1**
Production of rubber and plastic products	0.0	12.1	0.0	0.0	**6.1**
Manufacture of other mirror mineral products	0.6	3.0	1.3	2.3	**2.1**
Metallurgical industry	0.0	17.6	0.0	0.0	**0.0**
Machinery and equipment for the production of finished metal products	2.6	8.6	3.6	1.1	**2.2**
Production of electrical equipment	0.0	0.0	0.0	8.4	**0.0**
Manufacture of machinery and equipment not included in other categories	0.0	0.0	15.3	0.0	**0.0**

The share of districts in the manufacturing industry in the region in January-September 2024, %					
	Alat	Gijduvan	**Karakul**	Karaulbazar	Ramitan
Manufacture of motor vehicles, trailers and semi-trailers	0.0	0.1	4.5	0.0	**17.6**
Production of other cargo aircraft	52.1	0.0	0.0	44.0	**0.0**
Furniture manufacturing	1.0	22.9	2.7	0.1	**22.6**
Production of other finished products	0.0	10.5	0.0	0.0	**0.2**
Repair and installation of machinery and equipment	6.4	2.6	1.4	0.0	**0.0**

Table 7.27 Growth rates of production of consumer goods by project district - %

Growth rates of production of consumer goods by project district (as a percentage of the preceding year)							
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Bukhara region	**108,2**	**107,7**	**102,6**	**109,3**	**108,0**	**106,2**	**108,3**
Alat	104,0	111,4	101,7	115,9	102,1	118,4	107,9
Gijduvan	106,5	108,3	120,8	118,2	104,2	107,8	112,5
Karakul	102,7	112,9	102,7	116,7	106,3	106,3	106,8
Karaulbazar	105,6	79,8	100,4	101,2	102,9	105,2	105,4
Ramitan	107,5	108,4	111,9	101,5	104,2	105,8	105,7

7.9.3 Investment

In January-December 2024, the total amount of foreign investments and loans utilized amounted to 34.9 billion US dollars, of which 26.4 billion US dollars or 333.8 trillion soums, or 26.4 billion US dollars, were directed to the creation of new fixed assets, that is fixed capital. If compared with 2023, it amounted to 152.1 %.

The share of foreign investment and loans in fixed capital in the total volume of investments developed for January-December 2024 amounted to 67.6 %. Direct foreign investment and loans for the specified period amounted to 310.2 trillion soums, foreign loans guaranteed by the Republic of Uzbekistan - 23.6 trillion soums.

The share of foreign direct investment and loans, as well as foreign loans guaranteed by the Republic of Uzbekistan in the total volume of foreign investment and loans in fixed capital amounted to 92.9 % and 7.1 %, respectively.

In the composition of foreign direct investment and loans to fixed capital, foreign direct investment reached 150.5 trillion soums, or 45.1 % of their total volume, other investments and non-guaranteed loans - 159.6 trillion soums, or 47.8 % of the total..

Table 7.28. Investments into fixed assets in Bukhara Region (2018-part 2024)

	2018	2019	2020	2021	2022	2023	2024- I-IX
Investments into fixed assets - total, billion soums	9,610.9	10,366.6	12,183.9	20,528.3	21,638.3	31,030.5	35,342.9
Investments in fixed capital (growth rate, %)	60.6%	95.9%	104.7%	147.4%	94.2%	132.2%	144.5%

7.9.4 Indicators of investment and construction activity

The commissioning of housing and social facilities through new construction and reconstruction has been very rapid in recent years. For example, in **2010**, **639.5 thousand m²** of housing was commissioned, and by **2022**, this figure increased to **1,495.8 thousand m²**. In **2023**, the total area of housing commissioned was **1,499.9 thousand m²**.

Regarding social infrastructure, in **2010**, no secondary schools were commissioned. However, by **2022**, schools with a total capacity to accommodate **15.4 thousand students** were commissioned. In **2023**, secondary schools with a capacity of **5.5 thousand students** were commissioned.

Table 7.29. Socio-economic indicators of investment and construction activities in the Bukhara Region

	2018	2019	2020	2021	2022	2023	2024- I-IX
Commissioning of housing and social facilities through new construction and reconstruction:							
Total area of housing, thousand m^2	1,258.7	1,277.6	1,299.1	1,337.6	1,495.8	1,499.9	1,191.6
secondary schools, for thousand students	7.3	9.5	3.9	10.6	15.4	5.5	1.5
vocational colleges, for thousand students	0.4	-	0.03	0.4	-	-	-
Academic ones, for thousand readers	-	-	-	-	-	-	0.4
hospitals, thousand beds	0.8	0.4	0.1	-	0.5	-	-
polyclinics, including rural medical centers, thousand visits per shift	1.4	1.4	0.1	0.6	1.2	0.3	0.5
Construction works, billion soum	3,581.2	4,368.1	5,659.8	7,401.1	8,448.7	9,468.8	11,638.1

The pace of construction throughout the country and region has been growing rapidly over recent years (2018-2023/24). For instance, in 2018, the value of construction in the region amounted to 3,581.2 billion soums, and by 2022, this figure had reached 8,448.7 billion soums. In 2023, the total value of construction in the region increased further to 9,468.8 billion soums, and again in 2024. In the context of districts, a similar growth pattern is observed. **The highest growth rate among the project districts is seen in Ramitan district, where the value of construction increased from 292.6 billion soums in 2018 to 846.1 billion soums in 2022, and 1,080.2 billion soums in 2023**. Karakul was second where the value of construction increased from 161.8 billion soums in 2018 to 291.2 billion soums in 2022, 340.4 billion soums in 2023 and 605.4 billion soums in part 2024. However, Karakul had the lowest volume of construction in 2023 of the five project districts.

Table 7.30. The volume of construction in the project area (in Billion soums)

	2018	2019	2020	2021	2022	2023	2024- I-IX
Bukhara Region	**3,581.2**	**4,368.1**	**5,659.8**	**7,401.1**	**8,448.7**	**9,468.8**	**11,638.1**
Alat District	247.0	288.1	339.5	362.1	421.4	440.6	361.4
Gijduvan District	278.8	389.5	442.4	566.9	549.0	572.3	572.9
Karakul District	161.8	219.3	254.5	277.7	291.2	340.4	605.4
Karaulbazar District	292.5	278.0	368.1	437.1	404.2	635.9	401.8
Ramitan District	**292.6**	**360.3**	**379.3**	**960.3**	**846.1**	**1080.2**	**824.7**

7.9.5 Small business and entrepreneurship

As of January 1, 2023, the total number of operating small enterprises and microfirms in the Bukhara Region was 30,082 units, of which 2,392 were newly created.

And if their share in the region's GDP is 74.6%, the share in industry and construction was 37.1% and 82.8%, respectively. 74.5% of all employed are in small businesses and private entrepreneurship (2022).

Table 7.31. Share of small business and private entrepreneurship in the Bukhara Region (in % of the total), 2010 – 2024 (part)

Year	GDP	Industry	Construction	Employment rate
2010	64.1	18.5	53.3	76.5
2011	65.7	20.1	63.1	76.8
2012	65.5	23.8	62.9	77.3
2013	66.8	30.5	64.6	78.5
2014	67.0	33.0	64.9	78.8
2015	76.9	41.2	60.9	78.5
2016	78.4	46.0	65.8	78.5
2017	79.0	43.5	66.2	78.5
2018	80.3	41.5	83.5	76.5
2019	73.5	35.1	86.4	76.1
2020	75.6	35.1	79.3	74.9
2021	72.0	37.5	74.4	74.5
2022	74.6	37.1	82.8	74.5
2023	71.7	30.2	84.5	-
2024-I-IX	74.2	42.0	86.5	-

7.9.6 Retail trade turnover

The retail trade turnover in the Republic of Uzbekistan increased by 12.3% during January-December 2022 compared to the same period of the preceding year and amounted to **319,288.2** billion soums. The share of trade turnover of large enterprises amounted to 20.6**%,** the increase rate of **30.7%** compared to the preceding year**.** The retail turnover of small businesses increased by **8.0%** compared to the same period last year, the share of sales in the total retail trade turnover amounted to **79.4%.** Of the total turnover of small businesses, the sale of goods in unorganized trade amounted to **25,970.2** billion soums. The share of this sector in the total volume of trade was equal to **8.1%.**

The main indicators of retail trade in the Bukhara Region are set out in Table 7.32. An analysis by year shows that in recent years, the growth rate of retail trade has been going up by leaps and bounds. For example, the trade turnover in rural areas in 2020 amounted to 3621.8 billion. The same figure for 2021 was 5359.1 billion soums. The same can be observed for many other indicators.

Table 7.32. Main indicators of retail trade in the Bukhara Region (2017-2023)

	2017	2018	2019	2020	2021	2022	2023
Retail turnover, including catering organizations, sales in all retail chains, billion soums	**6,578.5**	**8,375.1**	**10,309.2**	**12,072.8**	**14,605.3**	**18,491.4**	**18,167.1**
including:							
In cities	4,605.0	5,862.5	7,216.4	8,451.0	9,246.2	12,188.2	-
In rural areas	1,973.6	2,512.5	3,092.8	3,621.8	5,359.1	6,303.2	-
Of the total volume of retail turnover, billion soums:	6,374.5	8,121.7	9,992.0	11,468.0	14,194.4	13,371.4	-
Groceries	204.0	253.3	317.2	343.9	5,296.8	11,633.9	-
Non-food products	6,170.5	7,868.4	9,674.8	11,124.1	8,897.6	5,855.9	-
Retail turnover per capita, thousand soums	3,543.1	4,454.9	5,398.9	6,103.1	3,409.5	13,264.4	-
Inventories in retail chains (at the end of the year, including consignment goods)	146.1	221.2	270.0	318.8	491.1	384.3	-
Total, billions soums	238.3	308.6	454.7	540.0	310.1	465.3	-
On turnover days	23.7	37.2	58.2	71.1	39.0	43.0	-
Retail facilities (at the end of the year)	9,776.0	10,170.0	9,272.0	14,531.0	11,763.0	12,187.0	-
Total, thous.	-	-	-	-	-	-	-
Per 10,000 inhabitants	52.0	50.0	54.0	74.0	119.0	382.0	-
Catering organizations (at the end of the year) total, thous.	686.0	942.0	695.0	334.1	1,082.0	1,140.0	-

7.9.7 Foreign trade turnover

The foreign trade turnover of the republic in January-December 2022 amounted to **50,008.4** million USD, and increased by **$7,837.9** million or **18.6**% compared to the corresponding period of the preceding year, including exports for 19,309.1 million USD (an increase of **15.9**% compared to the corresponding period of the preceding year), imports for an **30,699.3** million USD (an increase of **20.4%** compared to the corresponding period of the preceding year), respectively. The structure of exports also showed increases, including animal and vegetable oils, fats and wax increased by **13.9** percent (up to 19.6 million USD) compared to the same period of the preceding year, drinks and tobacco - by **3.1** percent (75.0 million USD), various finished products by **41.5**% (325.7 million USD), food and live animals by **18.9**% (259.8 million USD), and manufactured goods by **2.5**% (110.1 million USD).

In the structure of imports, the main share falls on machinery and transport equipment - **16.9**% (1,396.0 million USD), industrial goods - **22.0%** (1,039.4 million USD)**,** as well as chemicals and similar products - **16.0%** (583.5 million USD).

The indicators for foreign trade turnover of the Bukhara Region for 2022 amounted to 1 billion 227.7 million USD. If the volume of exports amounted to 310.2 million US dollars, imports amounted to 917.5 million US dollars. At the same time, the trade balance is negative and amounts to 607.3 million US

dollars. An analysis by country shows that the share of CIS countries in foreign trade turnover is 60.7% compared to 39.3%, for other countries that are not part of the CIS.

Table 7.33. Foreign trade of Bukhara Region (2018-2024/part)

Foreign trade of Bukhara Region							
	2018	2019	2020	2021	2022	2023	2024- I-IX
Million dollars							
Foreign trade turnover	**911.3**	**1,259.4**	**831.2**	**1,180.9**	**1,224.8**	**1,212.3**	**965.8**
export	187.2	265.8	231.1	312.1	306.5	301.4	222.6
import	724.2	993.6	600.1	868.8	918.3	910.9	743.2
trade balance	-537.0	-727.8	-369.1	-556.7	-611.8	-609.5	-520.7
including:							
With the CIS countries	**538.3**	**669.8**	**449.4**	**631.8**	**744.5**	**632.2**	**422.2**
export	62.8	102.4	87.1	92.9	160.6	165.6	103.4
import	475.5	567.4	362.2	538.9	583.9	466.6	318.8
trade balance	-412.7	-465.0	-275.1	-446.0	-423.3	-301.0	-215.5
with other countries	**373.0**	**589.5**	**381.8**	**549.1**	**480.3**	**580.1**	**543.6**
export	124.3	163.4	143.9	219.2	146.0	135.9	119.2
import	248.7	426.2	237.9	329.9	334.3	444.2	424.4
trade balance	-124.3	-262.8	-94.0	-110.7	-188.3	-308.3	-305.2
As a percentage of the preceding year							
Foreign trade turnover	**103.8**	**138.2**	**66.0**	**142.1**	**103.7**	**99.0**	**107.9**
export	92.8	142.0	86.9	135.1	98.2	98.3	99.4
import	107.1	137.2	60.4	144.8	105.7	99.2	110.8
Including:							
With the CIS countries	**93.3**	**124.4**	**67.1**	**140.6**	**117.9**	**84.9**	**83.5**
export	138.1	163.0	85.1	106.5	173.1	103.1	88.9
import	89.4	119.3	63.8	148.8	108.3	79.9	81.9
with other countries	**124.1**	**158.1**	**64.8**	**143.8**	**87.5**	**120.8**	**139.6**
export	79.6	131.4	88.1	152.4	66.5	93.1	110.8
import	172.2	171.4	55.8	138.7	101.4	132.9	150.7

7.9.8 Market services rendered

In January-May 2024, enterprises of the republic produced industrial products worth 292.0 trillion soums, the industrial production index compared to the same period last year was 108.4%. In the total volume of industrial production, the share of the manufacturing industry was 82.1%, mining and quarrying - 8.9%, electricity, gas, steam and air conditioning - 8.5%, water supply, sewerage, waste collection and disposal - 0.5%. Compared with the same period of the previous year, there is an increase in production volumes at manufacturing enterprises by 10.5%, at water supply, sewerage, waste collection and disposal enterprises by 1.4%, at electricity, gas, steam and air conditioning enterprises by 3.4% and a decrease in production at mining and quarrying enterprises by 1.3%. At the same time, compared with the same period of the previous year, there is a significant increase in output at enterprises producing other finished products (154.2% compared to January-May 2023), production of

coke and petroleum products (145.1%), motor vehicles, trailers and semi-trailers (123.9%), rubber and plastic products (127.1%) and production of tobacco products (117.2%). Compared with the same period of the previous year, there is a decrease in output at enterprises producing other transport equipment (98.2% compared to January-May 2023), production of electrical equipment (99.4%), as well as at enterprises producing computers, electronic and optical products (89.3%). .

7.9.9 Inflation rate

The consumer price index (CPI), which characterizes the level of inflation in the consumer sector of the republic, amounted to 105.5% for January-May 2024. The CPI for food products (including public catering) was recorded at 100.01%, non-food products - 102.5%, services - 120.0%. The contribution to the growth of the consolidated indicator of price changes for food products for January-May 2024 amounted to 0.01 percentage points. They accounted for only 0.2% of the total impact of the observed goods and services. The contribution of changes in prices for non-food products 1 to the growth of the consolidated CPI for the same period was recorded at 0.81 percentage points (14.8%), services - 4.64 percentage points (85.0%). Among the sections of the 2018 CPI RU, the CPI for January-May 2024 for housing services, water, electricity, gas and other types of fuel amounted to 135.0%, goods and services in the field of healthcare - 111.6%, alcoholic beverages and tobacco products, as well as restaurant services and hotel services - 103.9%, in the field of transport - 102.6%, household and other goods and services - 102.4%, household items, household appliances and current housing maintenance - 101.3%, clothing and footwear - 101.2%, services in the field of education - 101.0%, insurance and financial services - 100.9%. The CPI by December 2023 below the 100.0% mark was recorded for food and soft drinks (99.9%), as well as in the field of information and communication (98.0%). The acceleration of the growth rate of prices and tariffs for housing and communal services is due to the introduction of updated differentiated tariffs for electricity and gas consumption for the population based on the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated April 16, 2024 "On additional measures to introduce market mechanisms in the fuel and energy complex of the country", as well as an increase in the minimum fees for services in apartment buildings. The decrease in food prices is due to the influence of the seasonal factor, and in the field of information and communication - to a change in the tariff policy of a number of mobile operators. The contribution of price changes in housing services, water, electricity, gas and other types of fuel to the growth of the consolidated CPI for May 2024 to December 2023 reached 4.20 percentage points, or more than 75% of the total impact of observed goods and services. The restraining factor was the decrease in prices for food products and non-alcoholic beverages, as well as in the information and communication sector (in total -0.12 p.p.). The impact of other sections was less significant..

7.10 Transport

Year after year, the volume of transport services in the Bukhara region has been rapidly rising. In 2010, the volume of cargo transportation was 36.9 million tons, and this figure reached 59.6 million tons by 2022. In 2023, the volume further increased to 68.3 million tons. The cargo turnover was 1071.2 million tons in 2010, and by 2022, it amounted to 1704.7 million tons, reaching 2593.3 million tons in 2023. Almost the same growth rates can be seen in passenger transportation. In 2010, the volume of passenger traffic was 228.5 million passengers, which grew to 281.8 million passengers by 2022. By 2023, this figure had further increased to 291.3 million passengers. Passenger turnover amounted to 2111.1 million passenger km in 2010, and 9781.3 million passenger km in 2022. By 2023, the passenger turnover reached 10132.8 million passenger km.

Table 7.34. The volume of transport services by year in the Bukhara Region (2010-2024/part)

Year	Transportation of goods (million tons)	Cargo turnover (million tons)	Passenger transportation (million passengers)	Passenger turnover (millions passenger km)
2010	36.9	1,071.2	228.5	2,111.1

Year	Transportation of goods (million tons)	Cargo turnover (million tons)	Passenger transportation (million passengers)	Passenger turnover (millions passenger km)
2011	40.1	1,180.8	255.2	2,443.1
2012	44.2	1,313.1	274.6	2,684.3
2013	49.7	1,413.1	290.9	2,817.3
2014	59.2	1,564.1	322.1	3,147.3
2015	66.8	1,700.4	354.8	3,427.9
2016	57.5	1,253.6	263.4	9,021.4
2017	59.3	1,322.9	276.6	9,372.1
2018	67.1	1,439.8	290.5	9,716.6
2019	64.5	1,532.9	284.8	9,740.5
2020	58.2	1,530.4	256.4	8,802.7
2021	57.7	1,668.4	269.2	9,613.5
2022	59.6	1,704.7	281.8	9,781.3
2023	68,3	2,593.3	291.3	10,132.8
2024 -I-IX	52,6	2,024.1	218.3	7,591.9

7.11 Agriculture

According to preliminary data, the total volume of products and services of agriculture, forestry and fisheries in the republic amounted to 364522.8 billion soums as of 01.01.2023. Including agricultural products for 347564.4 billion soums, services in the crop and livestock industries, as well as in hunting for 5,573.4 billion soums, in forestry for 9223.0 billion soums, in fisheries for 3,162 billion soums.

The cultivated area under agricultural crops in the Bukhara region amounted to 240,035 hectares in 2022, compared to 237,709 hectares in 2018. However, in 2023 and 2024, this figure decreased to 219,719 hectares and 229,553 hectares, respectively, indicating a significant reduction in cultivated land in the region.

Comparing crop production for these years, it amounted to 2,426.3 billion soums in 2010 and increased to 33,255.9 billion soums in 2022. By 2023, the total agricultural products in the region reached 37,174.5 billion soums, continuing its upward trend.

It should be noted that entities engaged in agriculture are divided into three categories: farms, individual (dehkan) subsidiary farms, and organizations engaged in agricultural activities.

Table 7.35. Main indicators of agriculture in the Bukhara Region

The main indicators of agriculture in the Bukhara Region							
	2018	2019	2020	2021	2022	2023	**2024**
Cultivated land of agricultural crops, ha	**237 709**	**238 671**	**238 708**	**234 313**	**240 035**	**219 719**	**229 553**
Agricultural products, bln. soums	17 064,6	19 182,1	23 876,0	28 529,3	32 867,5	37 174,5	41 039,4
including:							
agriculture	8 854,7	9 463,0	11 646,6	14 100,4	16 848,3	17 857,0	19 655,0
animal husbandry	8 209,9	9 719,1	12 229,4	14 428,9	16 019,2	19 317,5	21 384,4
The growth rate of agricultural production	102,9	103,6	101,9	104,7	103,9	103,8	102,7

The main indicators of agriculture in the Bukhara Region							
	2018	2019	2020	2021	2022	2023	**2024**
as a percentage of the preceding year							
including:							
agriculture	99,1	103,7	100,6	105,2	105,1	102,9	101,0
animal husbandry	107,5	103,5	103,2	104,2	102,7	104,7	104,3

Table 7.36. Growth rates of agricultural production in Bukhara Region (as a percentage of the preceding year)

	Including:				Including:				Including:			
	Economic entities of all categories	Farms	Individual (dehkan) subsidiary farms	Organizations engaged in agricultural activities	Economic entities of all categories	Farms	Individual (dehkan) subsidiary farms	Organizations engaged in agricultural activities	Economic entities of all categories	Farms	Individual (dehkan) subsidiary farms	Organizations engaged in agricultural activities
	Total				Agricultural products				Animal husbandry products			
2010	107.6	108.6	107.1	108.0	108.6	108.3	108.3	182.4	106.2	115.3	106.2	93.4
2011	107.1	105.6	107.8	106.5	106.9	105.4	108.7	88.7	107.4	107.5	107.3	113.1
2012	106.3	101.4	108.3	111.4	105.3	101.1	109.4	134.6	107.5	105.2	107.7	104.4
2013	106.6	104.0	107.8	97.6	106.5	103.3	109.5	103.7	106.8	113.1	106.8	95.3
2014	106.7	103.2	107.9	110.5	106.8	102.9	110.8	59.3	106.6	106.5	106.1	132.5
2015	107.1	107.1	107.1	110.4	107.2	107.5	106.7	136.7	107.1	103.0	107.3	105.9
2016	108.4	108.7	108.2	112.2	109.1	108.7	109.0	156.7	107.6	107.8	107.7	101.1
2017	103.5	102.8	103.6	110.6	101.2	103.0	99.6	100.8	106.1	100.3	106.2	114.3
2018	102.9	99.3	103.4	156.8	99.1	98.5	97.7	276.4	107.5	112.5	107.2	113.2
2019	103.6	105.7	101.8	169.4	103.7	104.6	101.2	232.1	103.5	121.4	102.1	142.3
2020	101.9	104.5	101.2	96.3	100.6	103.4	97.5	106.0	103.2	115.4	103.1	84.1
2021	104.7	111.4	100.8	129.3	105.2	110.7	96.5	126.7	104.2	118.7	102.8	136.7
2022	103.7	107.9	100.8	119.4	105.2	107.7	101.0	111.0	102.9	109.5	100.7	138.8
2023	103.8	106.1	102.7	103.2	102.9	105.5	102.1	88.4	104.7	111.8	102.9	132.7
2024	102.7	94.6	104.1	128.2	101.0	93.6	104.0	145.5	104.3	103.0	104.2	108.3

If in 2022 agricultural products worth 33,653.0 billion soums were produced in the Bukhara region, it looks like as follows for the project districts: agricultural products worth 3,879.0 billion soums were produced in the Gijduvan district, this amounted to 3,550.7 billion soum in the Ramitan district, to 3,194.0 billion soums in the Karakul district, to 2,342.2 billion soums in the Alat district, and to 996.4 billion soums in the Karaulbazar district.

In 2023, the total agricultural products in the Bukhara region amounted to 37,921.8 billion soums. The agricultural output of the districts also saw increases, with Gijduvan district producing 4,298.6 billion soums, Ramitan district 3,951.4 billion soums, Karakul district 3,584.9 billion soums, Alat district 2,644.4 billion soums, and Karaulbazar district 1,070.7 billion soums.

Table 7.37. Agricultural products by project district

Agricultural products in the context of project districts (at current prices, billion soums)							
	2018	2019	2020	2021	2022	2023	2024-I-IX
Bukhara Region	**17,334.2**	**19,436.2**	**24,367.5**	**29,170.4**	**33,653.0**	**37,921.8**	**28,908.1**
Alat	1,182.7	1,397.4	1,711.1	2,062.8	2,342.2	2,644.4	1,997.2
Ghijduvan	2,092.0	2,342.6	2,861.0	3,326.1	3,879.0	4,298.6	3,175.1

Karakul	1,750.3	1,955.0	2,374.6	2,819.5	3,194.0	3,584.9	2,835.1
Karaulbazar	422.7	525.0	670.0	768.5	996.4	1,070.7	811.5
Ramitan	**1,544.8**	**1,761.3**	**2,279.0**	**2,867.1**	**3,550.7**	**3,951.4**	**2,896.2**

7.12 Summary of overall socio-economic indicators, patterns and trends for Ramitan

The in-depth socio-economic information and data set out in the sections above indicates a country and a region undergoing significant growth and development. All indicators are showing significant change including key demographics for population growth and migration, along with rising living standards and decreasing mortality rates. One clear finding is that a sizeable majority of people currently live in households of 5 people or more.

Significant investment has been targeted at both social and engineering infrastructure since 2010, e.g. numbers in pre-primary education, and the economy is transforming rapidly and production in all sectors is growing at pace along with significant increases in cargo transport and exports, e.g. the increase in the production of agricultural products has been enormous.

In addition, overall growth and development has been supported by the Funds for Reconstruction and Development and a significant increase in Foreign Direct Investment (FDI). Therefore, given the very positive overview of the socio-economic position of the country and the Bukhara Region, the investment from the AIIB is timely and will ultimately support and assist the sustainable socio-economic growth and development of the region in the short, medium and long-term for the benefit of existing and future generations of Uzbekistan’s citizens.

8 GRIEVANCE REDRESS MECHANISM

8.1 Introduction

Timely and effective redress of stakeholder grievances will bring sustainability in a project's operations. It will help advocate forming and strengthening relationships between project management and the stakeholder community groups and bridge gaps to create a common understanding, helping the project management operate efficiently in the area. To register and resolve the community's grievances in this process, a Grievance Redress Mechanism (GRM) will be established. The proposed mechanism will be based on two-tier grievance redress committees – at the settlement and project levels. The proposed GRM will help achieve sustainability objectives by dealing with the environmental and social issues of the project on time.

UzSuvta'minot JSC approved a GRM titled "Operational Grievance Management Procedures" for the Bukhara region Water Supply and Sewerage Project (BRWSSP), which will be used within the Project "Development and modernization of the sewerage system in Gijduvan, **Ramitan**, Alat, Karaulbazar and Karakul district centres of Bukhara Region (1st priority)".

The GRM serves to[24]:

- Create an effective consultation mechanism.
- Involve the public in the project.
- Increase transparency and accountability in the project.
- Allow for positive social changes in the community.
- Identify and address issues reducing environmental and social risks and improve or introduce optimum health and safety measures.
- Identify personnel misconduct.
- Identify other contraventions, within the Project, of AIIBs safeguards policies and Uzbekistan Legal Framework.

A GRM is a locally based and formal way for the employer and project executors to receive, assess and resolve complaints related to project activities and impacts. The GRM allows complaints to be responded to and resolved in accordance with the principles of impartiality, awareness, accessibility, timeliness, participation, feedback, gender and social inclusion and, together with specially trained personnel, is intended to help parties achieve prompt, effective, fair and acceptable solutions in a timely manner to reasonable satisfaction of both parties. The GRM aims to reduce the risk that a project would inadvertently cause harm to persons/beneficiaries and provides an important feedback mechanism for improving the impact of the project.

The GRM is designed to consider complaints and appeals from people who believe that they have been, or may be, adversely affected by the social and environmental impacts of project activities, and/or have complaints about the project's disclosure and public consultation process.

The GRM must be accessible to any individual or legal entity that feels affected by project activities. This will enable them to report their complaints easily and effectively. The GRM provides the public with an easily accessible means of resolving project-related issues directly, promptly, and free of charge. For a grievance resolution mechanism to be effective, it must be understood and supported by all project

[24] Although the GRM is not designed for it, this mechanism has been known also to provide communities a method of request of recommendation for additional project works for the Executing Agency to consider.

participants. Stakeholders, including affected communities, should be aware and clearly understand the benefits of this mechanism for themselves.

The project GRM takes into account national legislation, the specifics of project sites and the results of public consultations. The GRM provides for the possibility of appealing against any actions and decisions that violate the rights and legitimate interests of persons affected by the project and determines the procedure for handling grievances from individuals and legal entities within the framework of the project. The project GRM complies with the Law of the Republic of Uzbekistan "On appeals from individuals and legal entities."

This GRM does not substitute government mechanisms for resolving complaints and conflicts provided for by the legal system of the Republic of Uzbekistan but is an attempt to minimize their use whenever possible.

The GRM at the project level does not abrogate the right of claimants to request consideration of complaints in the manner prescribed by national law. The claimant, at their discretion, may request treatment of the complaint through the judicial system of the Republic of Uzbekistan at any time during the complaint resolution process provided for herein.

8.1.1 Grievance Focal Persons

Grievance Focal Persons (GFP) at the district level: Each district level of Suvta'minot appoints one of its employees as a coordinator (GRC) for the corresponding district. District level coordinators (GFP) must ensure that all complaints received are registered and facilitate their resolution at the district level (GRM Tier 1). District level coordinators provide information about each complaint received, their resolution process and status to the coordinator (GFP) at the level of PCU.

Coordinator (GFP) at the PCU level (central level): The Social and Environmental Specialist of the PCU acts as a GFP at the central level in the PCU. The PCU GFP has a common database on all grievances received and considered at both Tier 1 and Tier 2 of the Grievance Redress Mechanism. The GFP at the PCU level coordinates consideration of grievances at Tier 2, monitors and reports on the consideration of grievances at Tier 1 and Tier 2.

Contact details of coordinators (GFPs) at the district level and central level of the PCU should be available on the websites of UzSuvta'minot JSC and Bukhoro Suvta'minoti JSC, as well as in the Project information materials for public consultations at all stages of the project implementation

For prompt resolution of the problem, the district level Grievance Focal Persons (GFPs), contractors and PCU personnel, as appropriate, shall respond directly to inquiries, questions and complaints using informal approaches within the framework of business ethics. This includes, where possible, discussing with the grievant their requests, concerns and/or complaints and providing them with answers or informally seeking a solution to address the source of the problem. If necessary, they can refer the grievant and the case to the district level GFP.

If necessary, the district level GFP coordinates with the project team, including the contractor(s), construction supervision consultant and PCU, to promptly respond to requests, appeals or complaints from people. If the issue cannot be resolved by the district level GFP, it will be considered under the two-tier GRM at the project level as described below.

On November 26, 2020, a two-tier GRM was established at the project level and was further updated in January 2024.

8.2 Scope of application of the Grievance Redress Mechanism

The GRM considers requests/complaints that meet the following criteria:

i. Issues related to social impact, involuntary resettlement, environmental impact and project outcomes;

ii. Issues related to project disclosure and public consultation process. Appeals/complaints related to crime, fraud and corruption are recorded in the grievance log, however, they are not dealt with under the GRM at the project level and must be considered in accordance with the law of the Republic of Uzbekistan and the relevant policies of the AIIB; and

iii. Any significant claims that may represent a special case that resulted in a fatality must be resolved immediately.

8.3 Channels and forms for filing complaints/grievances

Complaints can be received, without limitation, by contact telephone numbers, helplines, hotlines, through the official website, official email address, by mail, Telegram messenger, filed personally, and anonymously.

Both written and verbal applications are possible. Grievances received by telephone are registered and treated as verbal complaints. Grievances received *via* the Telegram messenger, through the official website or official email address are registered in the form of electronic grievances and considered in the prescribed manner:

- Individuals and legal entities can file grievances individually or collectively.
- Grievances can be filed in the official language and other languages.
- Grievance must be signed with a full name and include all contact details.

If the complainant wishes to remain anonymous, and grievance or appeal received anonymously, such cases shall be registered and verified and confirmed for legitimacy.

8.4 Grievance Review Process

The grievance review process includes the following steps, depending on the complexity of the issue:

Acceptance of grievance. Grievance Review Committee (GRC) at the district level receives complaints and grievances directly from the grievant or through any project personnel, as well as GRC members at the local level or Tier 2 GRC at the PCU. Grievances filed through project personnel, GRC members at the local level or GRC at the central level at the PCU, or through other relevant agencies, are sent to the concerned district GRC for registration, coordination and documentation of the grievance resolution process.

Registration of grievance. The district-level GRC registers grievances in the grievance logs of the respective district centre. GRC at the PCU level keeps an electronic database of all received complaints and grievances. For this purpose, Excel software is used, which also allows sorting, filtering and conditional formatting of the data.

Screening and acknowledgement The district-level GRC evaluates the received complaint/appeal to determine whether it is related to the project activities and subject to consideration within the framework of the project GRM:

i. If the complaint/grievance falls within the scope of application of the GRM, the district level GRC informs the grievant accordingly. Within five (5) days of receiving the complaint/grievance, the district level GRC:
   - Sends the grievant confirmation of receipt of the complaint, informs about the acceptance of the grievance for review, further steps and the expected date of response to the grievant; and/or
   - Requests further clarification/information from the grievant if necessary.

ii. If the grievance/complaint does not fall within the scope of this GRM, the district level GRC will inform the grievant in an appropriate manner that the grievance cannot be considered under the project GRM, and

- within five days from the date of receipt of the letter, it will be sent to the relevant authorities, with notice given to the grievant in writing or electronically.

Statement of complaint/issue: clarify the claims of the grievant(s) and formulate a clear, concise and comprehensive statement of the issue/complaint with information such as:

i. Who is affected and how many;
ii. What happened, when and where;
iii. What decision the grievant expects.

Data collection and analysis. Collect and analyse information, and document the appeal /complaint using appropriate approaches, such as:

i. Collection and verification of documents, and background information (such as documents, photographs, videos, and meeting notes);
ii. Meetings with the grievant, and any other interested parties, and joint site visits, if the appeal/complaint refers to circumstances that require on-site examination, and in other necessary cases, when the appeal/complaint requires on-site consideration;
iii. Depending on the nature of the case, involve relevant government and independent experts, hold meetings with experts and the grievant, request further clarification and prepare minutes of meetings;
iv. At this stage, when additional information has been collected and analysed, check whether the wording of the complaint/problem remains the same or whether changes need to be made, as appropriate.

Documentation process. GRC at both the district and PCU levels should document the grievances/complaints and information collected on each case, and represent GRC at the local/regional level and at the second level in the PCU, as required.

Consideration of grievance and identification of solution options. Based on the information collected and analysed, conduct a hearing of the complaint with the participation of the plaintiffs and/or their representatives to consider options for resolving the complaint.

Development and selection of resolution options. Develop options and select the one that can be implemented and is affordable/acceptable to all by consensus.

Obtaining confirmation from the plaintiff. Obtain the grievant's written agreement or disagreement with the proposed solution. Hold a meeting to discuss the option and its outcome with the complainant.

Development and implementation of an action plan with timeframes. If the plaintiff agrees with the proposed resolution, an action plan with a time frame should be prepared, identifying the necessary resources and responsible parties to implement the decision made to resolve the complaint.

Grievance closure and reporting. Following completion of the action plan with timeframes:

i. Send to the grievant a written confirmation of the actions taken and results; meet with the complainant to ensure that the grievances have been fully addressed and that no further action is required, as evidenced by the minutes of meeting with the complainant;
ii. Prepare a grievance closure report with all documents filed in the case.

8.5 Approach to dealing with anonymous grievance submissions

If the grievant wishes to remain anonymous and files the complaint anonymously, then such complaints must be registered and verified. The GRC at Tier 1 examines the grievance to verify its credibility according to the situation described in the anonymous complaint or grievance and acts on behalf of grievant to evaluate and resolve the issue. If the arguments in the grievance are not confirmed, a conclusion is drawn up to this effect describing the grounds for termination of further consideration of the grievance. Conclusion on termination of grievance consideration of the complaint is approved by

GRC, after which its control is discontinued.

In the event that anonymous complaints or grievances would be difficult to review, resolve and protect the interests of the grievant, the grievant who filed anonymous complaints must provide sufficient facts and data to enable the GRC to investigate the matter.

Feedback received and decisions taken, actions planned and implemented in relation to anonymous complaints and grievances must be printed and posted on the information boards of the relevant regional branch of Bukhoro Suv Ta'minoti JSC and the relevant Hokimiyat and sent back to the source from which the anonymous complaint or grievance was received (e.g. unknown media account), if applicable.

GRCs involved in the implementation of the GRM ensure observance of confidentiality/anonymity.

The results of processing anonymous complaints and grievances and the process for resolving them should be documented in the grievance database and reflected in the regular project progress reports.

8.6 Institutional Structure of the Grievance Redress Mechanism

UzSuvta'minot JSC as an executing agency is responsible for the effective functioning of the GRM at the project level; it creates a database of all grievances received, ensures monitoring of their processing, analysis and reporting on the project progress, reporting on the environmental and social safeguards. Other stakeholders of the project, such as branches of Bukhoro Suv Ta'minoti JSC, contractor(s), Project Supervision and Management Consultants, must take an active part in resolving complaints and grievances.

The project supervision and management consultants and the district Suvta'minot shall register and report each case of complaint to the PCU at UzSuvta'minot JSC, which will keep a common database of all complaints and track their status as described below:

8.6.1 Tier 1: Local Grievance Redress Committees

Tier 1 of the Grievance Redress Committee (GRC) includes:

i. Supervision Engineer of PMC (with responsible E&S personnel);
ii. Contractor's representative (member);
iii. Chairman of the Mahalla area (member);
iv. Mahalla women leader
v. Head of the District branch of "Bukhara Suvta'minoti"
PCU local coordinator.

Relevant experts may be involved in grievance review as appropriate, or the GRC can request support from an appropriate party to resolve the issue in the prescribed manner. In particular, depending on the nature of grievance, it can be transferred for processing to government and local authorities (Hokimiyat, mahalla), contractor and water supply (Bukhoro Suv Ta'minoti JSC) organizations, as well as competent government agencies (Ministry of Ecology, Sanitary and Epidemiological Authority, State Committee for Land Resources, Geodesy, Mapping and Cadastre, etc.).

Tier-1 GRM receiving channels:	**Contact details:**
Contractor's representative	phone: tbd* telegram group: tbd*
Chairman of the Mahalla	phone: tbd* telegram group: tbd*
Mahalla women leader	phone: tbd* telegram group: tbd*
Head of the district branch of "Bukhara Suvta'minoti"	phone: +998 93-960-88-11 email: buxsuvtaminot.abii@gmail.com telegram group: @UzSuvBuxoroAdmin
PCU local coordinator	phone: +998 93 960 56 55

Construction Supervision specialist of PMC	phone: tbd*
Grievance boxes on construction sites and mahalla administrative offices	

**After construction work commenced will be identified*

The aggrieved persons (complainant) can contact any GRC representative, and the GRC representative will be responsible for receiving, hearing and resolving the grievances at this level (Tier 1). The grievance can be submitted to any GRC representative in paper or digital formal and include the information specified in Attachment 1 of the GRM.

As part of disclosure and public awareness, UzSuvta'minot will make the GRM document available on its website for attention of the public. The information to the public will include the contact details of the GRC at the local level and the GRC at the Second level at the PCU and channels, through which the customers can lodge their grievances, and the list of members of the GRC. Information, regarding the GRM should be communicated to the affected community at the earliest stage of the project by UzSuvta'minot during public consultations. During these activities, information brochures, as well as verbal communication and other relevant media can be used to explain the grievance receiving channels available.

Grievance is considered within fifteen days from receipt, with the exception of proposals that require further study, of which the individual or legal entity who filed the proposal is notified in writing. In this case, the review period is no more than one month. In some cases, UzSuvta'minot JSC or the GRC may shorten the period for grievance review.

If a grievance review and/or decision making is not possible at this level, or if the grievant is not satisfied with the proposed solution, the GRC will forward the case to the PCU at the central level of UzSuvta'minot.

8.6.2 Tier 2: Second Level Grievance Redress Committee

Tier 2 includes the PCU Grievance Redress Committee at the central level of UzSuvta'minot, which was established on April 1, 2021, and has the following membership:

i. PCU Project Coordinator, Chairman
ii. Environmental and Social specialist of PCU, member
iii. Chief specialist of the Administration of the Bukhara region Hokimiyat, member;
iv. Head of the Land Allocation and Compensation Coordination Unit, Bukhara region Hokimiyat, member;
v. Employee of the information service of Bukhoro Suvta'minot JSC, member.

Where necessary, appropriate experts are involved in grievance review in accordance with the procedures provided for by national laws and regulations

The GRC at this level considers complaints and grievances within fifteen (15) days from the date of receipt. If the grievance cannot be resolved at this level or the applicant is not satisfied with the proposed solution, the case may be referred to the court, as established by the law of the Republic of Uzbekistan. The court is beyond the jurisdiction of the project GRM.

The second-level GRC composition will be available at the office of Bukhoro Suv Ta'minoti and the PCU Coordinator's office in the water utility. Grievances can be received through letters, emails, text messages (SMS), verbal narration, grievance boxes, and registers (Table 8.1. However, the printed Complaint Registration Forms shall be available at the community centre (mahalla committee) and complaints will be registered on the Grievance Log.

Table 8.1 Tier-2 GRM Receiving Channels

Organization	Location	Contacts
UzsuvTa'minot JSC	Tashkent	Tashkent city, Bogishamol Street, 151A, E-mail: uzst@exat.uz, info@uzsuv.uz

Organization	Location	Contacts
		Phone: +998 (55) 503-12-55 Hotline: 1255 Telegram: @suvmuammobot; @uzsuv_chat; https://t.me/uzsuv Website: https://uzsuv.uz
Project Coordination Unit	Tashkent	Tashkent city, Do'rmon yo'li Street, 5 E-mail: po.aiib@uzsuv.uz Phone: +998 (99) 695-55-65
Environmental and Social Specialist of the AIIB PCU	Tashkent	Tashkent city, Do'rmon yo'li street, 5 E-mail: sayyora@uzsuv.uz Phone: +998 (97) 714-44-89
Bukhoro Suv Ta'minoti JSC	Bukhara	Bukhara city, Ibn Sino Street, 111 E-mail: bukharavodokanal@gmail.com buxsuvTa'minot.abii@gmail.com Phone: +998 (65) 221-13-08 Telegram: @UzSuvBuxoroAdmin
Bukhara Province Administration	Bukhara	Bukhara city, I. Muminov Street, 1 E-mail: buxoro@exat.uz Phone: +998 (65) 224-34-85 Hotline: (+998) 65-222-22-22 Telegram: @buxorouzmurojaatbot Website: https://buxoro.uz; Telegram: https://t.me/buxorouz_official

8.6.3 Court

At any stage of the two-tier GRM process, if an issue is not resolved or the grievant is not satisfied with the decision or process of the GRM, the aggrieved person may file their complaint through the normal, legal complaints processes in Uzbekistan, including the courts. However, this shall be at complainant's own expense, where decisions will be made in accordance with applicable national rules and legislation.

8.6.4 GRM on Gender and Social Inclusiveness

As part of the guiding principles of the GRM as related to gender and social inclusiveness, the grievance redress process shall consider social and gender roles, needs and constraints of men and women.

The project staff shall be trained and aware of gender-sensitive approaches. Confidentiality and discretion are particularly important in gender-sensitive cases.

Gender-based Violence (GBV) grievances such as sexual exploitation, abuse, and harassment (SEAH) will be handled under a special protocol governed by the following principles:

- SEAH is not acceptable under any circumstance.
- Action will be taken on every allegation.
- Action will be fair, timely, and have due regard for procedural fairness.
- Above all else, SEAH survivors' needs, rights, and safety will be prioritized.

The complainant will be informed that the grievance will be treated confidentially and without reprisals. PCU and PMC will establish a locked "post box" and grievance forms in the construction sites and near the community centers to make available to raise complaint confidentially, anonymous, or non-anonymous complaints in writing, at their choice. The complaint can also be submitted by telephone (through the toll-free phone number provided by PCU and PMC) and electronically through email.

PMC and PCU will also dedicate a specific time to speaking to the workers at the construction sites and residents of the subproject settlements on possible SEAH risks. Moreover, the PMC and PCU contact toll-free phone numbers will be made available at the community centers (makhalla committees) and

construction sites, so any affected person can call to file an anonymous or non-anonymous complaint (at their discretion). The complainant will have the option to denounce the situation to any of the project representatives.

PCU and PMC will act as ethics agents in examining and screening complaints, and if needed, forwarding them to legal means to provide an appropriate response according to the complaint types and, finally, notifying the complainant about the actions taken on their complaint. Upon receiving such a sensitive complaint, PMC and PCU will immediately act to clarify the facts confidentially and safely. PMC and PCU will approach the judicial authorities for investigation and criminal proceedings if needed.

If acts of SEAH involve any project personnel, PCU and PMC will take action on a case-by-case basis. If it is proven that the acts were committed, PCU and PMC will be empowered to take the following measures:

- Immediate termination of the contractual relationship (for those under an agreement that does not grant them the status of staff member or another collaborative agreement) or suspend employment, depending on the severity of the grievance
- Inclusion of a specific reference in AIIB and Uzsuvtaminot records to prevent persons subject to a sensitive complaint from applying for future offers and having other contractual relations with AIIB and Uzsuvtaminot when it is proven that they have participated in SEAH acts or have encouraged or tolerated such actions.
- PCU and PMC will provide information on medical and social services for dealing with sexual violence and, in the case of a non-anonymous complaint, encourage the victim to visit medical and social facilities to prevent any consequences of SEAH.
- Provision of report on preliminary investigation to the complainant confidentially, safely, without discrimination.
- Provision of report on criminal proceedings to the complainant confidentially, safely, without discrimination and avoid causing harm.
- Delivery of training on code of conduct in the populated area and workplace and training on GBV risks.
- PCU and PMC will continue to monitor the situation until it is finally resolved.
- All complaints and corresponding grievance settlement reports will be kept in the PCU office in Tashkent and made available for review to the AIIB mission.

8.7 Project-Affected People's Mechanism of the AIIB

The AIIB has a Project-Affected People's Mechanism[25]. Two or more project-affected people who believe that they have been or may be adversely affected by AIIB project activities and that their concerns cannot be adequately addressed through project-level GRM processes or AIIB governance processes may file a submission for an independent and impartial consideration by the Project-Affected People's Mechanism (PPM) of the AIIB.

For details of the process, time limits for filing a complaint and the types of complaints that fall under the Project-Affected People's Mechanism, please refer to the Rules of Procedure of the Project-Affected People's Mechanism issued by the Managing Director, Complaints-resolution, Evaluation and Integrity Unit (CEIU) on June 13, 201926. A summary is provided below:

i. The submission may be sent to the Project-Affected People's Mechanism by mail, email, fax or hand-delivered to PPM. The PPM can be contacted through a dedicated PPM website, *via* the AIIB homepage https://www.aiib.org or using the contact details below: Managing Director,

[25] AIIB Policy for the Project-Affected People's Mechanism of December 7, 2018. https://www.aiib.org/en/policies-strategies/_download/project-affected/PPM-policy.pdf

[26] https://www.aiib.org/en/policies-strategies/_download/project-affected/PPM-RofP.pdf

Complaints-resolution, Evaluation and Integrity Unit. Tel: +86-10-8358-0187; Fax: +86-108358-0003 Email: ppm@aiib.org

ii. The time limit for filing a submission is generally 24 months following the project Closing Date or the date of the last disbursement, depending on the financial regime.

iii. A submission is ineligible to be considered by the PPM of AIIB if
   - It does not relate to a project that has been approved for financing by AIIB or in relation to which a PSI has been disclosed;
   - It is anonymous;
   - It raises allegations of fraud, corruption or other prohibited practices or relates to procurement; and in other situations.

8.8 Monitoring and Assessment

i. The PCU carries out internal monitoring of the progress of complaints consideration through monitoring and controlling the grievance process to achieve resolution, and implementing decisions and taking mid-course corrective actions as necessary;

ii. Monitoring results should be presented in the social safeguards monitoring reports, quarterly project progress reports and other reports specified for each sub-project;

iii. Monitoring results will be used to evaluate the GRM and draw lessons, and for information disclosure and public awareness raising.

The Project Implementing Entity (PIE) Uzsuvtaminot JSC posts information about the GRM on its website for public viewing. The public information should include contact details for the GRC at the local level and the tier 2 GRC at the PCU, as well as channels to be used for filing a submission, and a list of GRC members.

Information about the GRC should be brought to the attention of the affected community at the earliest stage of project, during public consultations on social issues and environmental impact assessment, as well as during the development of design documentation and preparation of safeguard documents. These activities will include production of informational brochures and verbal communications, as well as other relevant media.

8.9 Grievance Mechanism for Contractor Employees

A GRC for employees will be established to deal with labor grievances, including members who are directly and indirectly associated with the construction work. The Company shall provide a locked box for Grievances to be posted into and only one representative of the Contractor Grievance Committee will have the key. The name of the representative taking Grievances may be provided during worker H&S Induction and anyone with a Grievance may contact them directly for help in completing a form in complaints submission. A Telegram Account will not be permitted, since Telegram messages may be deleted by either party in the correspondence. If the complainant wishes to be contacted, then a phone, email or other contact may be provided. They can be submitted either with names or anonymously, even though the latter might be difficult in circumstances of resolving issues concerning an individual worker. Specifically, one representative from each of the below will be selected to be a member in the GRC:

- A PCU Senior Engineer, who is in charge at the worksite as the ‘convener’
- A resident engineer of the Supervision Consultant
- A worker’s representative
- A contractor’s representative

The convener will designate an official to receive the complaints and ensure the complainant does not lose his job and is not intimidated into withdrawing the complaint before the formal hearing. While the GRM for contractor employees is not yet available, it is assumed that grievance receiving channels will include the convener's email address and phone number. In the case of an anonymous, it can be assumed that a grievance box may be utilised. In the event that anonymous complaints or grievances would be difficult to review, resolve and protect the interests of the grievant, the grievant who filed anonymous complaints must provide sufficient facts and data to enable investigation of the matter.

Employee complaints may include, but are not limited to, the following issues:

- Wages
- unpaid overtime job
- irregular or partial payments
- absence/inadequacy of living premises
- lack of clean drinking water and sewerage
- lack of medical care, *etc.*
- gender-related issues, e.g. wage discrimination
- sexual harassment

To ensure impartiality and transparency of the hearing of the appeal, they should be open to other workers on the construction site and held in an impartial environment.

GRC functions for employees:

- Complaint registration
- Recording the complaint details
- The reasons that led to the acceptance or rejection of individual cases
- Number of accepted or rejected cases
- Decisions agreed

The PCU and the contactor will keep a record of all permitted and unresolved appeals and summarize them in a semi-annual report. The recordings should be available for viewing by the AIIB and other stakeholders.

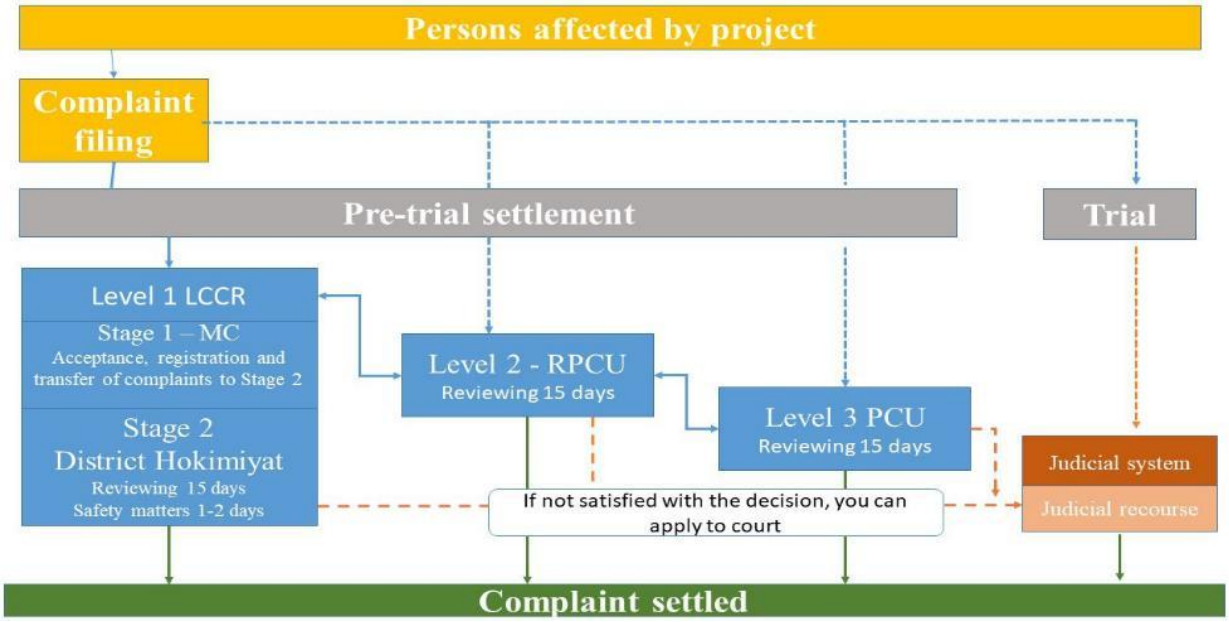


Figure 8.1. Grievance mechanism scheme

9 STAKEHOLDER ENGAGEMENT AND DISCLOSURE

9.1 Introduction

The Constitution of the Republic of Uzbekistan guarantees the right of people to information: "All government agencies, public associations and officials of the Republic of Uzbekistan are obliged to provide individuals with the opportunity to familiarize themselves with documents, decisions and other materials affecting their rights and interests". Uzbekistan has also taken significant steps towards joining the UNECE Aarhus Convention[27].

The AIIB Environmental and Social Framework includes a requirement to make available environmental and social information about the environmental and social risks and impacts in the Project area during preparation and implementation. This should be done in a timely, accessible, gender sensitive and inclusive and culturally appropriate manner, and in a form and language(s) understandable to the project-affected people, other relevant stakeholders who may have specific needs (related to disability, literacy and/or language).

The Project has utilised various communication and public involvement mechanisms, such as consultations in the format of public consultations/hearings, stakeholder meetings, community gatherings/meetings at the mahalla level, focus group discussions with residents and personal meetings with residents (also refer to separate SDDR document).

Consultations were held with relevant officials and employees of the Ramitan District, representatives of district government bodies - cadastre, architecture, ecology and nature conservation, sanitary-epidemiological service, educational institutions, Chairpersons and activists of mahalla areas (including female activists), relevant personnel of Bukhoro Suv Ta'minoti JSC, and residents of the sub-project area.

This section presents a summary of consultations that have taken place and the requirements for information disclosure.

9.2 Objectives of Information Sharing and Meaningful Consultation

Objectives: the main objectives of meaningful consultations and disclosure, with project stakeholders, including the members of the community in the project area are, to:

i) Encourage open dialogue and to create an atmosphere of good will and trust between the project stakeholders, the beneficiary and other members of the community and project personnel.

ii) Provide clear information on the rights of stakeholders and community members, during detailed design and construction periods of the project, including the grievance redress mechanism, and other full disclosure about the project and its impacts.

iii) Provide clear information about Project and how, including impacts, mitigation measures provided by the Project and how community members can provide their input into improvement of project mitigation measures by the Project and supplement mitigation for themselves.

iv) Obtain comments from project stakeholders, community and other local people, and others on environmental, social, health and safety and other community concerns, that are project related, to improve impact assessment and better design environmental, social, health and safety related management plans.

[27] AC_WGP-28_Item3_Ratification_Uzbekistan-Statement.pdf

v) Clearly set out the facts and details about the Project and Project impacts, risks and benefits, to ensure people living in the area and other stakeholders understand the Project. This will reduce the risk that vested interest or others will try to present a false or distorted version of the Project and/or approved draft and updated environmental, social, land acquisition and resettlement, health and safety and other assessment, impact and management plans to implement pre-project, during construction, commissioning and operation stages.

9.3 Vulnerable People Identified

Vulnerable people that may be affected by the Project have been identified and consulted as part of the Ramitan Project. A list of vulnerable people identified (3 431 people in total) is presented in Table 9.1.

Table 9.1 Vulnerability in Ramitan Project Area (as of December 2024) (Source: Mahallas Social Passports of Ramitan Project Area)

SN	Category of vulnerability	A. Navoi	Bobur	Guliston	Zarafshon	Ibn Sino	Afrosiyob	Ramitan	Uba	Tarnaut	Total
1	Number of families without a breadwinner	23	22	12	6	14	17	44	13	105	**256**
2	Single mothers/fathers headed household, with children, elderly and/or disabled dependents										**0**
3	Solitary elderly persons	8	2	4	15	2	4	2	1	1	**39**
4	Families on low income	97	84	62	10	84	87	75	104	137	**740**
5	Families receiving child benefits for children aged 0 to 14	95	82	39	39	48	78	72	104	128	**685**
6	Large families of 4 or more children	13	24	12	25	5	6	25	7	6	**123**
7	No. of persons with disabilities	97	58	76	150	85	67	71	89	116	**809**
8	No. of person on social welfare payments (loss of work capacity / unemployed)	0	2	4	3	5	9	3	3	9	**38**
9	Number of highly vulnerable women	55	82	71	99	96	62	97	93	86	**741**
	Total	**388**	**356**	**280**	**347**	**339**	**330**	**389**	**414**	**588**	**3431**

9.4 Consultations, Participation and Awareness

9.4.1 Stakeholder Identification

Stakeholders identified and consulted with are identified in **Ошибка! Источник ссылки не найден.** below.

Table 9.2. List of Stakeholders

Stakeholder Group	Stakeholder	Direct-Indirect
Government Representatives	• Khokim of Bukhara Regional Administration • Deputy Khokim on Investments of Bukhara Regional Administration • Head of Construction Department of Bukhara Regional Administration • Bukhara Regional / Ramitan District Public Health and Wellbeing Service • Bukhara Regional / Ramitan District Environmental Protection Committee • Khokim of Ramitan District Administration and his Deputies • Cadaster of Ramitan District • Architect of Ramitan District	Indirect
Client	• Bukhoro Suv Ta'minoti JSC • Ramitan branch of the Bukhoro Suv Ta'minoti JSC • Uzsuvtaminot JSC • Project Coordination Unit • Project supervision and management consultant • AIIB as funding source	Direct
Community Representatives	• Chairmans of Mahalla Committees (x 9) • A woman activist of the Mahalla Committees • Chairmen of street committees	Indirect
Community Members	• Household residents of the district center	Direct

There were numerous formal and informal consultations and awareness meetings with affected households, community, and other interested stakeholders in relation to the Project in Ramitan. This section presents the stakeholder consultation and participation activities, conducted separately, with the various project stakeholders and communities.

Table 9.2 provides a summary of the consultation events undertaken for the Ramitan Project. The table includes the list of stakeholders identified and consulted with, as well as details about the dates and place of consultation events, and the main issues raised and discussed.

Table 9.23. Summary of consultations undertaken for the Ramitan project (*Annex 3*)

Meeting Date, Type of Meeting (Consultation/ / training / awareness) and informal /formal meeting	Place of Public Consultation	Number of participants	Consultees (e.g., general community, NGOs, farmers, etc.)	Issues addressed at the event	Main Issues raised	Results
6 April 2023 Public Hearing	Conference hall of Hokimiyat of Ramitan district centre	26	- *Representatives of State Authorities:* representatives of the district governmental bodies of the Sanitary and Epidemiological Authorities, Environment and Nature protection, Architecture, Cadastre, Educational institutions and relevant employees of the hokimiyat - Chairmen of the Mahalla Committee and active representatives of the mahalla committees, - Representatives of the Bukhoro Suv Taminot JSC branch in Ramitana district centre.	The following issues were discussed at the public consultation: (a) draft Working Design; (b) AIIB Environmental and Social Framework, (c) initial social screening.	When will construction work starts? How long will the construction work take? Who will carry out the construction works? Will local people be employed?	- Project launch - At the public consultation, it was announced that the date of public hearing is the cut-off day and a detailed explanation was given of its implications.
July 2023 Focus-Group Discussion	- Conference hall of Mahalla Committee - In the courtyards of multi-storey buildings	26	- Women representing their households representatives of the mahalla areas, school teachers, employees of preschool institutions, Deputy Chairman of the mahalla for women's issues, a representative of the sanitary-epidemiological service, as well as personnel of healthcare institutions	*Project Information*: - Details about the project and its importance for the livelihoods of local communities, including vulnerable groups. *Feedback Collection*: - Gathering input on the proposed investments and their potential social and environmental impacts. *Social Policy Awareness:*	How will households connect to the sewerage system? What will be the cost of sewerage services? How will the cost of sewerage services be calculated? Who will bear the cost of connecting households to	*Project and Construction Information*: - Providing mahalla residents with details about the project and upcoming construction works. *Feedback Collection*: - Gathering responses and insights from the residents. *Resident Interest:*

				- Focus Group participants were informed about the social policy of the AIIB.	the centralized sewerage system?	- Assessing the community's interest in a centralized sewerage system.
1st December 2023 Consultation	Office in Bukharo City	10	Representatives from JSC "Bukhoro Suv Ta'minoti" the Regional Project Coordination Unit (PCU) in the Bukhara region, the Consultant "Nicholas O'Dwyer," and its local partner, LLC "Asia Engineering Group."	*Inform the Client:* - Notify the Client that during construction, household septic tanks located outside property boundaries along the roadside may obstruct the work. These septic tanks could potentially be damaged. *Anticipate Potential Issues:* - Highlight that this situation may result in complaints from residents during the construction phase. *Adopt a Unified Stakeholder Approach*: - Establish consistent methods for engaging with stakeholders to address these concerns effectively.	*Household Septic Tanks as a Potential Obstruction*: - Septic tanks located outside household boundaries along the roadside can significantly hinder construction activities. *Risk of Damage and Complaints:* - As these septic tanks may be damaged during construction, this could lead to complaints from residents and potentially result in the suspension of construction works. *Responsibility of Local Authorities:* - It is essential to recognize that preparing district center areas for construction is the responsibility of local authorities. *Need for Stakeholder Engagement:* - Understanding the importance of engaging with local stakeholders to address these issues effectively.	Bukhoro Suv Ta'minoti JSC. instructed the Consultant to conduct public consultations with local authorities and residents in each district centers

16, August 2024 Public consultation	Conference hall of hokimiyat of Ramitan district centre	29	- *Representatives of State Authorities:* representatives of the district governmental bodies of the Sanitary and Epidemiological Authorities, Environment and Nature protection, Architecture, Cadastre, Educational institutions and relevant employees of the hokimiyat - Chairmen of the Mahalla Committee and active representatives of the mahalla committees, - Representatives of the Bukhoro Suv Ta'minoti JSC branch in Ramitan district centre.	*Discussion Topics:* - "Regulations on Individual Housing Construction" approved by Resolution No. 272 of the Cabinet of Ministers of the Republic of Uzbekistan (dated December 30, 2006). - Law of the Republic of Uzbekistan "On the Sanitary and Epidemiological Welfare of the Population" (No. 393, dated August 26, 2015). - Resolution of the Cabinet of Ministers of the Republic of Uzbekistan "On Further Improvement of the Environmental Impact Assessment Mechanism" (No. 541, dated September 7, 2020). - Resolution of the President of the Republic of Uzbekistan "On Measures to Improve the Procedure for Allocating Land Plots for Utility and Communication Networks" (No. 204, dated April 12, 2022). - Implementation of Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 482 (dated August 12, 2020) for the project "Development and Modernization of Water and Sewerage Systems in the Bukhara	- When will construction work starts? - Which households' septic tanks may interfere with construction works? - What should households do if their septic tanks interfere with construction works? - How will households be connected to the centralized sewerage system? - How much can it cost to connect to a neighborhood well? - Who will pay for connecting the household to the centralized sewerage system? - Do I have to connect to the centralized sewerage system? - And how much will sewerage services cost?	*Understanding of Regulations*: Recognizing that septic tanks located outside household boundaries are considered illegal constructions. *Community Meetings:* The need to hold meetings at the level of Mahalla Committees. *Public Consultation Protocol:* Signing the Public Consultation Protocol. *Agreement with Resolution:* Acceptance of the Public Consultation Resolution.

				Region," supported by the Asian Infrastructure Investment Bank. Environmental Impact: *Septic tanks contribute to environmental pollution.* *Advantages of Centralized Sewerage:* *Improved quality of life for residents of the district center.*		
August 2024 Public consultations	In the offices of Mahalla Committees, near houses along streets and intersections.	51	Residents of the mahalla, members of Mahalla Committees, and chairpersons of neighborhood committees.	Household septic tanks located outside property boundaries along the roadside can significantly obstruct construction work, as they may be damaged during the process. These septic tanks are considered illegal constructions. According to the law, illegal constructions must be dismantled at the expense of the owner of the illegal structure	- Household septic tanks pollute the environment and are a source of disease spread. - The constructed centralized sewerage system will improve the living conditions of the residents	*Understanding of Status:* - Recognized that septic tanks located outside household boundaries along the roadside are considered illegal constructions. *Acknowledgment of Responsibility:* - Understood that septic tanks must be dismantled at the owner's expense and relocated within the household's property during the construction period. *Voluntary Agreement*: - Agreed to voluntarily dismantle their septic tanks at their own expense before the start of construction.

9.4.2 Formal Consultation and Public Awareness

As noted above, during the course of preparing this ESIA for Ramitan, there were formal Consultations, including public meetings, key informant interviews and focus group discussions. These involved local and district government officers, local businesses and community members. The following is an overview of the formal meetings (i.e. where meetings were scheduled in advance and/or minuted formally or with press coverage).

Archaeological Monument: 'Tepa-5' (Kharaton village, Ramitan), a meeting of the Scientific and Expert Council was held in December 2024 (No. 02-11/85, Minutes No. 22 referring to Letter No. 04-KM/2248), which confirmed the following:

'Having comprehensively studied and discussed the agenda issues, the Scientific and Expert Council decides: 109. To approve the sewerage project in the protected areas of the "Tepa-5" archaeological monument located in Kharaton village, Ramitan mahalla, Ramitan district, on the condition of its implementation under the supervision of archaeology experts… On the basis of Resolution No. 649 of the Cabinet of Ministers dated 15.10.2021, supervision over the implementation of the project work shall be entrusted to the project designer and the Department of Cultural Heritage of Bukara region'.

A copy of the minutes from the December 2024 meeting are provided at *Annex 3.*

As a result of this recommendation from the Scientific and Expert Council (December 2024), an Archaeological Expert will form part of the Project implementation team, particularly in relation to pumping station (PS) 2, which is located 230 m west of the monument. Mitigation measures in relation to archaeology are examined in the following section – Section 10.

In addition, a stakeholder consultation meeting in relation to septic tanks took place on the 1st December 2023 in NOD's offices at Khamkor Business Center.

Stakeholder Public Meetings are a requirement under the Environmental Laws of Uzbekistan and must be incorporated into the overall design of the project and the EIS. A number of public stakeholder meetings were held for this Project including a meeting with all the Chairmen of the relevant mahallas, in April 2023. *Annex 3* presents the minutes of these meetings.

Mahalla Consultation/Focus Group Discussions (FGDs) were held to inform local residents about the project and its significance for the population, including vulnerable groups, and to receive feedback on the proposed investments and their social and environmental impact. FGDs were held for each of the mahallas at the buildings of Bobul MCG, Zarafshan MCG, A.Navoiy MCG, Gulistan MCG and Tarnaut MCG in August 2024. The minutes of these meetings are presented in *Annex 3***.** Based on the results of the speeches and group discussion, a Decision was drawn up and read out to those present. A summary of the results of voting for the Decision of the Mahalla Citizens' meeting dated 17th August 2024, which is similar for all the focus group discussions, as follows:

1. *Participants of the meeting support the project for the construction of a centralized sewerage system in the Ramitan town in the Bukhara region. The participants are aware that sewerage networks, sewage pumping stations and wastewater treatment plants will be built.*
2. *Participants understand the need to move their septic tanks located on public property to the territory of their household.*
3. *Households whose septic tanks are located outside the private household must write a statement that they will move their septic tanks at their own expense.*
4. *The Mahalla Committee is responsible for collecting statements from households. In order to optimize the flow of documents, it is better to make householder statements in tabular form.*

5. *When the centralized sewerage system is built, all households of the mahalla shall be connected to it.*
6. *This protocol shall be posted in the building of the Mahalla Committee for public information.*
7. *The list of this mahalla meeting participants and statements from households for the relocation of their septic tanks at their own expense before the start of construction work is an integral part of these Minutes.*

Clearly, the in-depth stakeholder and public consultation phase confirmed that there is overwhelming support for the Ramitan project as it will result in wide-ranging benefits including, improved water sanitation, reduced infectious diseases/improved human health, increased climate resilience, enhanced gender equality and enhanced water quality management in accordance with UN SDG5 Gender Equality, SDG6 Clean Water and Sanitation, and SDG13 Climate Action, etc.

There have also been discussions involving the Government Agencies. These agencies contributed to the information presented in the approved EIS/ZVOS:

- Bukhoro Suv Ta'minoti JSC;
- Center for State Ecological Expertise;
- Hokimiyat of Ramitan and associate Mahalla representatives.
- Meliorative Expedition at the Basin Office of "Amu-Bukhara" Irrigation System;
- Scientific and Expert Council re. Tepa-5; and
- Ministry of Ecology, Environmental Protection and Climate Change (MEEPCC)

9.5 Continuing Consultation and Participation Strategy throughout the Project

Stakeholder consultations, including institutional, community and project beneficiaries, should continue throughout the project period. A process of ongoing consultation with local government bodies and agencies, local self-governments, community representatives and beneficiaries should be carried out regularly, with a particular focus on women's rights and opportunities for community-based project issues. Stakeholder engagement will provide an opportunity for these parties to express their views on the risks, impacts and mitigation measures of the sub-project and will include their appropriate consideration by the PCU, the Supervision Consultant and the Contractor.

The main purpose of public consultation and engagement will be support and facilitation for the project implementation, maintaining friendly relations with communities, reduction of conflicts and friction with the population, and effective management of any grievances.

Stakeholder consultation and participation will be provided in the course of implementation through the following tools:

- Grievance Redress Mechanism (GRM);
- Regular meetings of the Client with Contractors, Supervision Consultant, PCU;
- Implementation of the Gender Action Plan and capacity building;
- Information campaign using a social video through social media;
- Informal consultations during the implementation of the sub-project, especially during site inspections before, during and after construction in the project area.

Table 9.3 below sets out how stakeholder consultation and public participation will be provided in the course of implementation through specific tasks, and participatory tools and mechanisms.

Table 9.3. Proposed Strategy for Consultation at Various Project Phases at Ramitan

№	Task	Participants	Tools	Frequency	Responsible
1	Agreeing the Contractor's work schedule	Contractor, PIU, Engineer, District Hokimiyat, Railway Administration, Road Administration, District Hokimiyat Improvement Department, Representatives of Mahalla Committees, Relevant Households/Farmers/Land Users	Meetings	As needed	JSC "Bukhoro Suv Ta'minoti" and its district branches
2	Outreach work regarding construction activities - update on timetable of work	Contractor, Client, Engineer, District Hokimiyat, Mahalla Committees, Other stakeholders as needed, PIU	Meetings, Project progress reports, Information materials Media notifications Grievance mechanism	Monthly / Weekly	Engineer
3	Implementation of the Gender Action Plan (GAP) and capacity building	MSG communities, JSC " Bukhoro Suv Ta'minoti " and its district branches, Contractor, PIU	Gender Action Plan and capacity building activities	According to the schedule	Gender specialist of SCP
4	Connection of households to the centralised water supply system	Contractor, JSC " Bukhoro Suv Ta'minoti " and its district branches, Mahalla Committees, Relevant households, PIU, Engineer	Meetings with relevant households, Information materials	As needed	Contractor
5	Commissioning of the facility	Contractor, PIU, Engineer, District Hokimiyat	Commissioning of centralised sewerage facilities by the Commission	Upon completion of construction work	JSC " Bukhoro Suv Ta'minoti " and its district branches
6	Management of the Grievance redress mechanism	Contractor Client Engineer	Receipt, registration, review of the complaint. Feedback	Monthly	PCU
7	Monitoring	Contractor Client PCU	Meetings Monitoring reports	Monthly	Engineer

9.6 Information Disclosure Strategy

As part of information disclosure, the ESIA, and Gender Action Plan (GAP) in English and summary in Russian and Uzbek will be available on the websites of UzsuvTa'minot JSC and AIIB upon the clearance of the documents. Moreover, the AIIB and UzsuvTa'minot JSC will post the semi-annual environmental monitoring reports to be prepared by PMC on their website.

A summary of the environmental and social assessment in Russian and Uzbek will be available to local communities and relevant authorities via the district SuvTa'minoti branches who will distribute the Uzbek version of the executive summary to the rural and urban local communities within the Bukhara region including Ramitan.

The Draft ESIA and GAP will be disclosed in UzsuvTa'minot JSC's website for public consultation meeting, after consultation meeting the feedback that will be received from stakeholders will be reflected in the Final ESIA and GAP. The final ESIA and GAP will be then re-disclosed.

10 ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

10.1 Introduction

This section of the ESIA presents the environmental and social risks and impacts identified to be likely to occur as a result of the Project during the various phases, i.e. pre-construction/construction and operation. The robust impact assessment is based on the findings of:

- data collected from secondary sources and desk studies;
- site inspection visits; and,
- consultations with Government agencies, private businesses, and other community members.

Mitigation measures are proposed where potential significant impacts are identified and assessment with mitigation in place is carried out to determine significance of the potential residual impacts (i.e., those impacts that will likely remain after the implementation of mitigation measures).

10.2 Environmental **Risks and Impacts**

As described in Chapter 2, the key steps in the assessment process are to identify the study area, or Area of Influence (AoI), characterize the existing baseline, determine the risks and effects that may occur as a result of the construction and operation of the Project, identify how these impacts may affect baseline conditions, evaluate the significance of likely effects/impacts, and identify mitigation and enhancement measures that are relevant to reduce any adverse effects and maximize any benefits resulting from the Project.

The following sections assess the environmental impacts associated with the Project, and a summary including mitigation measures and residual impacts is provided in Table 10.4.

10.2.1 Climate, GHGs. Climate Risk & Climate Adaptation

This section assesses the potential impacts of the construction and operation of the Project on climate, at a macro and micro level, with a view to proposing appropriate mitigation measures to mitigate against any significant impacts identified.

Construction

GHG Emissions

Greenhouse gas (GHG) emissions in construction arise from several sources, posing a medium risk, which can contribute to climate change over a long period or permanent impact over time. Construction works, especially construction machinery and traffic will give rise to GHG emissions. It is the importance that Uzbekistan places on climate change and the use of machines and waste generation emitting GHGs that deems this issue a medium risk. The direct impacts are short term, within the town of Ramitan, and sensitive receptor level is high; the impact is moderate adverse. However, there are several potential mitigations to control and reduce the emissions as listed hereunder.

Mitigation Measures

In order to reduce GHG emissions during construction, sustainable procedures and materials shall be used throughout the construction process as far as is practicable. Lean construction principles will be adopted with an aim to reduce waste, rework and energy consumption. Optimisation of site layout and transportation routes will also reduce fuel consumption and associated emissions. Use of local materials will be sourced insofar as is possible. The contractor will use efficient construction machinery, that reduce GHG risks. The contractor's CEMP will also provide details in relation to these mitigation measures. Refer to the ESMP in Section 11, which provides detailed measures for implementation.

Residual impacts (i.e., following implementation of mitigation measures) from GHG emissions from the construction phase is minor.

Fuel, LNG and electricity consumption data will be recorded on site and used to calculate the project's impact on climate change. A registration table has been created and is attached in the *Annex 5*, as an example.

During construction phase, in relation to proposed mitigation measures, a Climate Change Risk Assessment (CCRA) will be undertaken for the Project in accordance with ISO 14901:2021 – the time horizons for the assessment will be 2030, 2050 [and 2100]. This CCRA will align with Uzbekistan's emerging National Climate Change Strategy, National Adaptation Plan and will complement existing laws and decrees relating to climate change.

Operation

Integrated water resources management

As highlighted in Section 6.1, climate risks are deeply intertwined with water security, food security and land degradation in Uzbekistan and the Bukhara Region. The World Bank Group stated in a 2023 report entitled, *Uzbekistan Country Climate and Development Report* (November 2023[28]):

'*with rising temperatures, reduced precipitation, and retreating glaciers*, *Uzbekistan is projected to be among the most water-stressed countries in the world'.*

The Project is part of a strategic investment to improve integrated water resource management and ensure strict compliance with sanitary and environmental standards, in accordance with the UNSDGs (SDG6) and numerous laws and decrees. This will have a major positive impact[29] on overall urban and strategic infrastructure resilience and overall human health and well-being in the project area.

In addition, the Project will have a long-term positive impact in relation to promoting regulatory reforms to improve management of wastewater infrastructure delivery and increase water-use efficiency at a national and regional level. It is envisaged that the Project will act as a catalyst for the modernisation of wider water infrastructure and the public wastewater accounting system in the Bukhara Region.

Mitigation Measures

The Project will have a major positive impact on community resilience and enhance overall capacity for climate adaptation in accordance with SDG13 Climate Action.

During the operation phase, the Climate Change Risk Assessment (CCRA) tables developed for the Project in accordance with ISO 14901:2021 will be used as a guide for managing the impacts of climate change on project units (such as pumps, water quantity, temperature) and will be improved if necessary.

Reduction of GHG Emissions

Currently, the 'Do Nothing' situation in Ramitan is that sewage in open cesspools releases (untreated) GHG emissions into the atmosphere, which are concentrated in the urban area (see Figure 6.3 in relation to CO_2 emissions in urban areas).

The direct, non-biogenic GHG emissions (scope 1), occur during the wastewater and sludge treatment processes. Unlike in other sectors, the direct CO_2 emissions are considered carbon neutral due to their biogenic nature, i.e., produced by the biodegradation of organic compounds in wastewater (as opposed to burning fossil fuels) (Maktabifard et al., 2023)[30]. However, non-CO_2 direct emissions, including methane (CH_4) and nitrous oxide (N_2O), are a risk due to their high global warming potential (GWP).

[28] Uzbekistan Country Climate and Development Report

[29] This is equivalent to the Institute for Environmental Management and Assessment's (IEMA) Guidance to Assessing GHG Significance Framework (2002) – '*Significant: Beneficial'*

[30] Maktabifard, M., Al-Hazmi, H.E., Szulc, P., Maousavizadegan, M. Xu, X., Zaborowska, E., Li, X., Makinia, J. 2023. Net-zero carbon condition in wastewater treatment plants: A systematic review of mitigation strategies and challenges. 185. Renewable and Sustainable Energy Reviews.

For example, as the climate in the Bukhara Region warms, the number of days with abnormally high air temperatures will increase, which may impact on any treatment pond and sludge treatment production, including odours and potential human and animal health issues.

The scope 2 GHG emissions are due to the energy and electricity consumption by the WWTP. The level of emissions will depend on site-specific factors, such as treatment technologies, plant size and regional differences in wastewater management practices.

In order to minimize impacts, at detailed design stage, approaches to reduce GHGs will need to be incorporated into the design for both scope 1 and scope 2 emissions. In the absence of detailed design at this stage, the residual impact from scope 2 emissions is considered minor.

The WWTP will ensure that GHG emissions are significantly reduced in a built-up urban area and will result in a major beneficial impact.

Building climate change resilience

During the operational phase, it is proposed that climate data and other datasets will be created, monitored and communicated as part of the operation of the Project, in order to enable the robust assessment of climate risks during the life-time of the Project. This will include the quantification of GHG emissions from the Project in accordance with AIIB's ESF 2016 (as amended 2024). These datasets will be communicated and made available to other key stakeholders to use, e.g., mean temperatures and changes in temperature, changes in wastewater temperature, levels and patterns of GHG emissions, number and frequency of heatwaves, and overall patterns and trends in relation to climate stress on the overall system, etc. This will help improve transparent, integrated and smoothly functioning climate data infrastructure at a regional and national level. These datasets will help to integrate climate change measures and mechanisms into regional and national policies, strategies and planning.

Ultimately, the Project will ensure that climate concerns are embedded into major public investment decisions and will help raise public awareness and empower mahallas to promote local climate action. Government capacity building for mahalla specialists on climate change risks and strategies for mitigation, can enable mahallas to raise awareness of climate change in the community, develop local climate action plans, and implement local initiatives that strengthen community resilience and capacity for climate adaptation.

The Project will have a major positive impact on community resilience and enhance overall capacity for climate adaptation in accordance with SDG13 Climate Action.

10.2.2 Soil and Geology

This section assesses the potential impacts of construction and operation of the Project on soil and geology with a view to proposing appropriate mitigation measures to mitigate any significant impacts identified.

Construction

Loss of soil

Even though soil quality in the area experiences various challenges, as described in Section 6.3. Soil is a valuable, non-renewable, resource and particularly important in an area prone to desertification. Loss of soil can occur when the site is stripped for construction, and also in the preparation of construction compounds. A risk was identified because excavated topsoil may be removed or mixed with subsoils, during excavation by the contractor, and disposed of rather than recycled. Soil and spoil that is removed and stockpiled for reuse, is vulnerable to wind and rain erosion as well as silt erosion into nearby water. The risk may be reduced by benching stockpiles of soils that are over 5 metres in

vertical height with a bench at every 1.5-2 metres vertical height and installing cut-off ditches or silt fencing, to prevent soils from escaping to watercourses, downstream, of the site.

Topsoil and subsoil records stripped in the field will be recorded taking into account the volume removed. A registration table has been created for topsoil and is attached in the *Annex 6*, as an example.

Temporary land acquisition may be required for construction camps, stockpiles and workshops. In such cases, if agricultural soil is present in the areas, approximately 30 cm of soil will be stripped and stored in piles.

The SPSs, WWTP and pipe network, where excavations will reach a depth of 1.5 or more metres, will be required to undergo either benching or shoring of the sides to preserve vertical height and to prevent cave-in incidents. In order to avoid a moderate impact, any topsoil removed should be sent for reuse elsewhere or used within the landscaping scheme. This would result in no significant residual effects.

Soil erosion and siltation at outfall-collector junction point

During construction, excavation and civil works will be carried out at the interface between the WWTP outfall and the collector canal. As described in Section **Ошибка! Источник ссылки не найден.**, the engineering design has included head walls and a length of concrete walls for the collector canal that runs both upstream and downstream of the outfall. Given these design measures, loss of particulate material is not expected to be extensive, however, any soil erosion that does occur during these works could impact on the canal resulting in siltation. This impact will be minor given the primary mitigation in place to reduce soil erosion. To further minimise loss of soil, the contractor will need to make special provisions to schedule construction in this area during the period when the drainage collector is at its lowest volume. In addition, during the drainage collector civil works, silt fencing mechanisms, including physical cofferdams will be implemented, as required. With these measures in place, the residual impact will likely be neutral.

Operation

Soil sealing

Construction of the WWTP will be on a greenfield site and will result in soil sealing of that area. Soil sealing contributes to soil degradation and in this case will affect agricultural land. Secondary effects of this include putting biodiversity at risk, increasing the risk of flooding and water scarcity and contributing to global warming. However, given the scale of the plant relative to the surrounding area, the change is considered negligible to low in magnitude, while, given the local climate, the sensitivity of the receptor (the soil) is considered to be high. The impact significance is therefore minor to neutral.

10.2.3 Water

This section assesses the potential impacts of construction and operation of the Project on hydrology, water resources, and surface water quality with a view to proposing appropriate mitigation measures to mitigate any significant impacts identified.

Construction

Risk of contamination of surface water & groundwater

During the construction phase, there is a risk of accidental pollution incidences.

Machinery activities on site during the construction phase may result in contamination of run-off / surface water. Potential effects could arise from accidental spillage of fuels, oils, paints, *etc*., which could impact surface water if allowed to infiltrate to surface water systems. In the absence of mitigation,

surface water run-off during the construction phase may contain increased levels of hydrocarbons, other pollutants.

Concreting operations carried out near surface water drainage points during construction activities could also lead to discharges to a watercourse. Concrete (specifically, the cement component) is highly alkaline and any spillage to a local watercourse would be detrimental to water quality.

Spillages could also impact groundwater quality if the contaminants reach the water table.

Contamination of surface water and groundwater through spillages of contaminants, could result in a moderate impact depending on the extent of contamination, in the absence of mitigation.

In order to mitigate these potential effects, refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area (or where possible off site) which will be away from surface water gullies or drains. In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double-skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as “Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors” (CIRIA 532, 2001) will be complied with.

All oils, solvents and paints used during construction will be stored within temporary bunded areas. Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be bunded to a volume of 110% of the capacity of the largest tank / container within the bunded area(s) (plus an allowance of 30 mm for rainwater ingress). Drainage from the bunded area(s) shall be diverted for collection and safe disposal.

A drip tray will be placed under each generator used in the field. All drip trays used will have the capacity to contain 110% of the amount of oil and fuel contained in each respective generator.

Where feasible, all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to surface water bodies and the underlying subsoil. Wash down and washout of concrete transporting vehicles will take place at an appropriate facility off-site.

In the case of drummed fuel or other chemicals used during construction, containers will be stored in a dedicated internally bunded chemical storage cabinet and labelled clearly to allow appropriate remedial action in the event of a spillage.

Emergency response procedures will be outlined in the detailed CEMP and ESMP. All personnel working on the site will be suitably trained in the implementation of the procedures.

With the proposed mitigation measures in place, the potential residual impact is considered to be neutral.

Wastewater produced from the worker accommodation camp and facilities could result in surface water & groundwater pollution if improperly managed. This could occur through runoff contamination, if wastewater is not properly treated or disposed of and it runs off into nearby surface water bodies. Improperly managed wastewater, especially if stored in unlined or poorly maintained septic systems, can seep into the ground, which can cause groundwater contamination. In terms of mitigation measures, temporary wastewater collection systems will be established in camp areas and construction sites and waste will be collected in impermeable septic tanks. The collected wastewater will be extracted by vacuum trucks and transported offsite by a licenced contractor for treatment at the nearest Wastewater Treatment Plant.

With the proposed mitigation measures in place, the potential residual impact is neutral.

Water availability

The specification for the Project includes use of local canal water supplies for construction. However, in dry summer periods, the water supply may be at minimum levels that will only support the community and irrigation water users. In such cases, *i.e.,* where the Hokimiyat find water resources are not sufficient, the contractor shall be required to find a different water source. During summer, therefore, there is an increased risk that a reduction in water availability could affect construction programme.

The Contractor will be instructed to supply its own potable water for workers and in the camps for drinking and domestic uses. This will also ensure that the Project does not put added pressure on water resources in the area and avoids disputes over access to water with other water users as referred to above. With this mitigation in place, the residual impact is minor.

Drinking water and usage water records will be recorded on during construction phase. A registration table has been created for drinking water record and is attached in the *Annex 7*, as an example.

The monitoring points for groundwater will be agreed upon between the contractor and UzSuvta'minot, a template for the coordinates can be found in *Annex 8*.

Operation

Impacts of surface water run-off from WWTP

During operation, as mentioned in Section 4, surface water run-off from the proposed WWTP is appropriately treated prior to discharge. Appropriate treatment includes petrol interceptors and silt removal if there is a risk of pollution from fuel spillages or silt discharges, respectively.

Section 5.5 presents the effluent targets that the WWTP is designed to achieve.

Treated surface water runoff is required to meet the regulatory requirements for discharge quality, including limits on oil and grease content, turbidity, and other pollutants.

Surface water collected from the sludge composting area will be collected in a separate system to the remainder of the WWTP site, and together with the leachate from the sludge composting process shall be returned to the Biological Treatment Units for further treatment.

With these primary measures in place, risk of contamination of water runoff during operation from the WWTP is considered to be unlikely/low and therefore the residual impact is neutral to low.

Compared to the current situation, since raw sewage will no longer reach the canals, the impact on the canal and surface water network will be reduced overall, contributing greatly to the improvement in water quality. During the monitoring studies, it is also envisaged that currently high parameters such as sulphate, and COD will decrease to lower levels, including other parameters such as BOD and nitrates due to dilution of their current concentrations due to the improvement in domestic wastewater inflow.

It is also predicted that the concentration of heavy metals reaching the aquatic ecosystem will decrease and improve over time due to the pre-treatment works to be carried out in industrial facilities that will want to connect to the sewage line coming to the WWTP.

Risk of system disruptions

While there will be a guaranteed life of the proposed SPS and WWTP, periodic maintenance and ad hoc maintenance may lead to interruptions of service to the population connected to the sewage network. Regular management of maintenance may be controlled through public awareness announcements 24-48 hours prior to any disruptions.

However, in case of an accident, emergency protection measures include bypass pipes that allow overflow to downstream collectors or cut-off of upstream water supply in case of accidents such as heavy rain, flooding, or sudden snowmelt. Also, as a separate sewer system, during high-rainfall events no direct flow into the system is expected, and the 70% design capacity of the pipe network allows for some infiltration.

The CAS system is sensitive to temperature fluctuations and extreme weather events like high rainfall and droughts, both of which can disrupt treatment processes. Sudden or extreme temperature fluctuations can disrupt microbial communities, hinder sludge settleability, and impair pollutant breakdown. Maintaining stable temperatures is crucial for consistent CAS system performance. The system has been designed to work properly with water temperature from +10C to +35C. Since wastewater flow is continuous, it is unlikely that the temperature will rise above +35C or drop below +10C. Normally, the temperature fluctuates around +17C. WWTPs are protected from high-rainfall events and droughts, with systems in place to prevent untreated water from bypassing. The proposed WWTP will manage flow from the main SPS, ensuring it can handle maximum capacity. During droughts, the proposed WWTP will maintain performance with previously received wastewater using flow equalization, effluent reuse and other water-saving measures. Overall, the risk is considered insignificant.

Discharge effluent

The State Ecological Expertise of Bukhara requires that the waste-water collector canal effluent be treated to Uzbekistan fishpond standard for water quality.

As noted in Section **Ошибка! Источник ссылки не найден.**, the design and specifications of the proposed WWTP includes primary, secondary and tertiary treatment processes, which will ensure that the effluent meets the fishpond water quality standards discussed in Section 5.5.3 and Section 6.5. The design of the WWTP also considers seasonal variation temperatures, fluctuating in the range between +12 and +25C. Tertiary wastewater treatment is designed to remove nutrients, pathogens, nonbiodegradable compounds, inorganic dissolved solids and suspended solids, heavy metals and micropollutants that remain after the secondary treatment stage. After tertiary treatment, the disinfected wastewater can be used for certain applications including irrigation. Tertiary treatment is preferred where the discharge water enters sensitive aquatic ecosystems (such as estuaries, sluggish rivers or waters close to coral reefs).

Given the inclusion of tertiary treatment, a minor impact on water quality is expected. Regular water quality monitoring will be conducted as part of the Trial Operation Period to verify that the WWTP is operating in accordance with the required environmental standards. Furthermore, water monitoring equipment is recommended for installation at the collector point to measure effluent quality outputs throughout the operational phase to determine when effluent quality is below the required standards.

The Navoi Gas-Thermal Power Plant is one of the largest power plants in operation in Uzbekistan which provides electricity to the Navoi, Samarkand and Bukhara regions. The Combined Cycle units CC1 and CC2 are currently operational (commissioned in 2012 and 2020, respectively). The Navoi Thermal Power Plant Modernization Project (CCGT No. 3, 4) is currently in construction with a completion date of the end of 2026. The waters of the Zarafshon river are used for production needs of the plant. The draft Environmental Impact Statement (EIS) for the construction of the two J class CCGT (Combined Cycle Gas Turbine) Units (No. 3, 4) states the following:

‘*Surface waters will be less affected due to reducing the discharge of thermal waters and reducing the addition of pollutants into the surface watercourse, as well as reducing the withdrawal of water through the use of circulating water supply system with fan cooling towers’.*

In summary, no significant negative impact was identified on water quality and water supply available in the Zarafshon River Basin upstream of Bukhara. Therefore, no likely significant cumulative effects on water quality are expected.

Impacts to Groundwater

As described in Section 4, the pipes used in the pipeline network will be PE pipes, which are not susceptible to corrosion, making it low risk of leakage. No significant effect is thus expected from the pipeline network during operation.

However, in the absence of mass community awareness campaigns, there is a risk that household users of the centralized system are unfamiliar with its use and may deposit inappropriate materials either within the household connection and/or the manholes. These types of incidences may cause system interruptions at the local SPSs, within the pipeline itself and/or the WWTP.

Currently, in the absence of a centralised sewer system, there is a high risk of regular and numerous incidents involving leaks from individual cesspits or septic tanks that contaminate soil and groundwater. The construction and operation of a centralised wastewater treatment plant will eliminate this risk of pollution to groundwater (and soils) from regular failings of individual systems, thereby resulting in a (major) significant beneficial impact.

10.2.4 Air Quality

This section assesses the potential impacts of construction and operation of the Project on air quality with a view to proposing appropriate mitigation measures to mitigate any significant impacts identified.

Construction

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (e.g., traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources such as traffic emissions where pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under calm conditions and low wind speeds when the movement of air is restricted. As seen in the Bukhara Hydromet data, presented in Section 6.1, on average, throughout the year, northerly winds prevail.

Receptor sensitivity and proximity to proposed works areas are considered in the impact assessment. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties (where people are likely to spend most of their time), schools and hospitals. Figure 6.6 illustrates that the site area for the Project, including the pipeline network is largely within the urban settlement, which includes residences, schools, and religious buildings. Receptor sensitivity is therefore considered to be high. The WWTP is located southwest of the main settlement area.

The largest potential effect on air quality during the construction phase of the Project is from construction dust emissions and the potential for generation of nuisance dust. With respect to dust, nuisance dust may result in loss of amenity due to dust deposition or visible dust plumes, often related to people making complaints, but not necessarily sufficient to be a legal nuisance. While construction dust tends to be deposited within 350 m of a construction site, most of the deposition occurs within the first 50 m (IAQM, 2014[31]). The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts, etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction.

As described in Section 6.1, in general, the territory of the Bukhara Region belongs to the arid zone. Winter precipitation, on average, is most often in the form of drizzling rain, and a minimal number of

[31] Guidance on the Assessment of Dust from Demolition and Construction Version 1,1. (Institute of Air Quality Management (IAQM), 2014).

days of snowfall. In spring, precipitation is mainly in the form of brief showers. In summer, the weather is hot, dry and there is little to no precipitation. Autumn is warm and overcast with rain in the second half of the season. Almost 60% of precipitation falls in January - April. Therefore, dust generation has the potential to be larger in the summertime.

In determining the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area. The major dust generating activities are divided into four types within the IAQM guidance to reflect their different potential effects:

- Demolition: there are no demolition activities associated with the Project and therefore no demolition impacts;
- Earthworks: includes excavating material, loading, and unloading of materials, tipping and stockpiling activities;
- Construction; and
- Trackout: transport of dust and dirt from the construction site onto the public road network.

The risk of dust impacts from each activity is identified and presented in Table 10.1 and based on extent of works.

Table 10.1 Summary of dust emission risk used to define site-specific mitigation

Potential Effect	Dust Emission Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Emission Magnitude	-	Large	Medium	Large
Dust Soiling Risk	-	High Risk	Medium Risk	High Risk
Human Health Risk	-	High Risk	Medium Risk	High Risk

The magnitude of risk determined is used to prescribe the level of site-specific mitigation required for each activity to prevent significant effects occurring.

Given that the location of the construction works is close to highly sensitive receptors, in the absence of mitigation, risk to human health is considered medium to high risk of dust soiling and human health effects associated with the proposed works.

Mitigation Measures

Best practice dust mitigation measures will be implemented to ensure that there are minor to no significant effects at nearby sensitive receptors. In addition, during construction of the pipeline network, due to the linear nature of the pipeline, not all receptors will be affected at any one time. It is proposed to install approximately 100m of trench at any time thereby reducing the potential dust emission magnitude from excavation and infilling activities.

The following measures shall be taken to avoid dust nuisance occurring under unfavourable meteorological conditions:

- The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust effects and nuisance are minimised;
- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions;

- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details;
- It is recommended that community engagement be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses;
- A complaints register will be kept on site detailing all telephone calls and letters of complaints received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out;
- Backfill, bedding and pavement materials will be stored in designated storage areas, and the materials will be moistened and compacted to prevent wind dispersion;
- The access roads to the construction site will be systematically watered;
- Trailers of transport trucks carrying materials such as excavation material, sand / gravel in the construction area will be covered with tarpaulin;
- In order to prevent mud from being carried on the roads, truck tires will be cleaned;
- It is the responsibility of the contractor at all times to demonstrate full compliance with the dust control conditions herein; and
- At all times, the procedures put in place will be strictly monitored and assessed.

The dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed, and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are described below.

There is also the potential for traffic emissions to affect air quality in the short-term over the construction phase, particularly due to the increase in HDV accessing the site. Impact is considered minor to moderate, and with the CEMP in place, residual impact will be minor.

Periodic maintenance of construction vehicles will be carried out and recorded, and the unnecessary idling of work equipment will be prevented in order to reduce emissions.

Emissions from the on-site generators also have the potential to affect air quality in the short-term over the construction phase. Regular maintenance of generators will be ensured. The generators used in the field and the amount of fuel used will be recorded on a monthly basis.

Fuel consumption data used in the field will be recorded on a monthly basis. See *Annex 5* for an example of the fuel consumption registry.

Air quality monitoring will be carried out at pre-construction stage at the locations provided in A*nnex 9*. These locations will be agreed upon by the environmental authority before sampling has taken place. This sampling will be carried out by the contactor.

Operation

During operation, the pipeline network will be buried underground and therefore there will be no emissions to atmosphere. There is the potential for maintenance vehicles accessing the site to result in emissions of NO_2, dust and CO_2. However, due to the infrequent nature of maintenance activities and the low number of vehicles involved emissions are not predicted to be significant.

As described in Section 6 and illustrated in Figure 6.1, the prevailing winds blow from the north and north-east direction. Sensitive receptors are thus located upwind of the WWTP and will not be expected

to experience odour issues. As mentioned in Section 4, odour control is provided through air extraction and covers and odour removal efficiencies are included in the Schedule of Performance Standards. The ESMP defines that an odour control unity, consisting of a chemical scrubber and biofilter, will be incorporated into the WWTP design to treat the gases before releasing them into the atmosphere. Thus, under normal operating conditions, no significant impacts from odour are expected. Odour motoring is included as part of the EsMoP.

Further air quality monitoring in the locations provided in *Annex 9* will be carried out during the operational stage.

10.2.5 Noise & Vibration

This section assesses the potential noise and vibration impacts on sensitive receptors during construction and operation of the Project with a view to proposing appropriate mitigation measures to mitigate any significant impacts identified.

Construction

During the construction phase, the key civil engineering works that have the potential to generate noise and vibration impacts include:

- Site preparation works;
- Excavation;
- Infilling and landscaping; and
- Construction traffic accessing the site and moving along local routes.

As noted in Section 6.6 and illustrated in **Ошибка! Источник ссылки не найден.**, sensitive receptors are located within proximity to the proposed SPSs and associated pipeline network, which are located within the urban environment. The WWTP is located 550m from the nearest residences. During construction, noise and vibration from plant on site may impact sensitive receptors in the vicinity. WHO guidelines for community noise allow for (outdoor) nighttime noise of 45 dBA and 55 dBA during the day. Reference is also made to British Standard BS5228-1:2009+A1:2014 *Code of Practice for Noise and Vibration Control on Construction and Open Sites - Noise*. BS5228-1:2009+A1 gives several examples of acceptable limits for construction or demolition noise, the most simplistic being based upon the exceedance of fixed noise limits. For example, paragraph E.2 states:

"Noise from construction and demolition sites should not exceed the level at which conversation in the nearest building would be difficult with the windows shut."

A list of plant and machinery to be used during the construction phase will be detailed in the Construction Environmental Management Plan (CEMP). Table 10.2 illustrates typical construction machinery that may be used during the construction phase and includes associated noise levels at 10m which are reproduced from BS 5228-1: 2009+A1:2014.

Table 10.2 Construction noise predictions

Phase	Item of Plant	Data Reference	L_{Aeq} at 10m (dB)	% On Time
Example of typical construction plant that could be on site at any one time during the construction phase	Excavator	BS 5228-1:2009 Table C.4:64	75	100
	Backhoe	BS 5228-1:2009 Table C.4:14	67	50
	Bulldozer	BS 5228-1:2009 Table C.2:10	80	100

Phase	Item of Plant	Data Reference	L_{Aeq} at 10m (dB)	% On Time
	Wheel Tractor	BS 5228-1:2009 Table C.4:74	80	100
	Dumper	BS 5228-1:2009 Table C.4:7	78	100
	Loader	BS 5228-1:2009 Table C.4:66	69	100
	Dump Trucks	BS 5228-1:2009 Table C.5:16	81	100
	Tipper Truck	BS 5228-1:2009 Table C.2:30	79	100
Overall			**92 dB L_{Aeq} at 10m**	

As described, the pipeline network will be constructed within the existing roads and streets within the urban settlement, adjacent to dwellings. Therefore, there will be little attenuation of noise due to distance. Impacts are likely to be adverse, direct, moderate to major, and temporary.

In terms of vibration, during breaking and excavation there is potential for vibration to propagate through the ground, which may have an effect on nearby buildings including the Tepa-5 cultural heritage site which is located ca. 230m from the nearest proposed pumping station site. Guidance relevant to acceptable vibration within buildings includes British Standard BS 7385-2:1993 Evaluation and Measurement for Vibration in Buildings - Guide to Damage Levels from Ground Borne Vibration and British Standard BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Vibration. BS7385:1993 states that there should typically be no cosmetic damage if transient vibration does not exceed 15 mm/s at low frequencies rising to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above. These guidelines relate to relatively modern buildings and should be reduced to 50% or less for structurally unsound buildings. At this stage, it is considered that the likely levels of vibration are expected to be below the vibration criteria for building damage or utilities damage based on experience from other sites, and therefore, significant impacts are not expected. However, monitoring will be undertaken at identified sensitive buildings, where proposed works have the potential to be at or exceed the vibration limit values.

In order to mitigate noise and vibration impacts, the ESMP shall list mitigation measures, also in line with the engineering specification, including:

- Consultation with community giving at least 24 hours' notice of construction at specific areas of the community and provision of information to the household of potential impact and what the household may wish to do to also reduce this risk.
- No nightwork will be carried out without permission from the Supervision engineer, PCU and district environmental authorities and in special cases only. In these special cases the surrounding residents shall be informed of the works and inconvenience at least 48 hours prior or as per Uzbekistan laws (whichever is longest lead time).
- An ongoing noise monitoring programme shall be set up, number and locations of Noise Monitoring Terminals (NMT) to be agreed with the contractor. Spot check noise measurements will also be carried out on a monthly basis, which can be coincided with works that have the potential to generate high levels of noise in order to confirm the potential extent of impact. A monthly noise monitoring report should be prepared by the contractor.

- Use of appropriate plant for the location, in accordance with the findings of the geotechnical investigation.
- The selected construction contractor shall also conduct a “crack survey” before construction, so that evidence of project construction versus normal wear and tear of a damaged structure may be assessed.
- Contract specification will discourage older equipment, which is generally louder and more polluting machinery.

The following outline guidance in relation to specific plant will also be applied:

- For mobile plant items such as cranes, dump trucks, excavators and loaders, the installation of an acoustic exhaust and/or maintaining enclosure panels closed during operation can reduce noise levels by up to 10dB. Mobile plant should be switched off when not in use and not left idling.
- For percussive tools such as pneumatic concrete breakers and rock drills, noise control measures include fitting muffler or sound reducing equipment to the breaker ‘tool’ and ensuring any leaks in the air lines are sealed. Localised screens should be erected around the breaker or drill bit when in operation in close proximity to noise sensitive boundaries.
- For all materials’ handling it shall be ensured that materials are not dropped from excessive heights and drop chutes/dump trucks are lined with resilient materials.
- For compressors, generators and pumps, these can be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation.
- Demountable enclosures can also be used to screen operatives using hand tools and may be moved around site as necessary.
- All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.
- White noise reverse alarms should be utilised on vehicles where practicable to reduce potential annoyance of tonal noise emissions from site.

Noise level monitoring will be carried out at pre-construction stage. The monitoring points for noise level monitoring will be agreed upon between the contractor and UzSuvta’minot. Once the monitoring locations are decided upon the coordinates can be logged for ease of reference, a template for the noise monitoring location coordinates can be found in *Annex 10*.

With mitigation measures in place, and considering that the construction phase is temporary, residual impacts are likely to range from minor to moderate depending on location of works.

Operation

During operation, no significant impacts are expected in relation to the pipeline network.

As described in Section 4, the WWTP is required to ensure that the maximum noise level 20m from the Site boundary of the wastewater treatment plant does not exceed the Noise Standard limit specified in the Schedule of Performance Standards when all equipment installed is being operated.

Engineering design abatement measures will be put in place for the noisy equipment items at the WWTP. It is expected that the blowers typically used to provide aeration in activated sludge plants will be the main cause of noise at the WWTP. The blowers shall be fitted with silencers at the inlet and outlet and acoustic enclosures, and the noise level shall not exceed 85dBA at 1 m away from the blower. In terms of vibration from the blowers, this will be greatly reduced by using vibration isolation techniques. Vibration isolators (like rubber mounts or spring mounts) will be used to absorb and reduce vibrations

produced by the blower. Moreover, minimising vibrations and therefore reducing noise will be achieved by ensuring the blower is properly aligned and balanced.

Within the WWTP, there are also several progressive cavity pumps, but they are slow-rotating equipment (max 150 rpm) and typically do not generate noise.

Another piece of equipment that will be used in the WWTP is the centrifuge decanter which is used in the sludge dewatering process. It is supplied with its own case, which fully encloses the rotating parts, significantly reducing noise. Additionally, the decanter is housed within a building, further minimising noise levels. While the case is not as soundproof as the acoustic cabin for the blowers, the centrifuge itself is not as noisy as the blowers.

Typical sound level data for the pumps to be used (i.e.,10 – 35kW (typical motor size 160 – 200) appear to be typically 73 – 80 dB LpA at 1 metre distance. As described in Section 4.1.2, the SPSs will be installed underground which will help to attenuate noise. These types of pumps are also commonly installed next to dwellings/apartment/office blocks. The residual operational impact is therefore considered to be minor under standard operating conditions. The ESMP and ESMoP will include for a noise monitoring programme to be established for the initial operating months.

10.2.6 Archaeology and Cultural Heritage

This section assesses potential significant impacts on archaeology and cultural heritage as a result of the Project during both construction and operation with a view to proposing mitigation measures as appropriate to mitigate any potential significant impacts.

Construction

Damage to heritage assets

UNESCO World Heritage Sites (WHSs): There are a total of seven designated UNESCO World Heritage Sites (WHSs) within Uzbekistan, none of which are located less than 10 km from the Project boundary area. As a result, there is no risk to these important cultural (x5) and natural (x2) heritage assets. Nor will there be any direct (physical) or indirect (off-site) negative impacts on WHSs. For example, the Silk Roads: Zarafshan-Karakum Corridor (Chor Bakh Necropolis) and the Historic Centre of Bukhara, are located *ca*. 12.5 km south and *ca*. 13 km, south of the project boundary, respectively.

In addition, given that the majority of the proposed construction works will be underground and temporary in nature, there will be negligible impact on these important sites, e.g., there will be no impact on the historic and visual settings of the UNESCO WHSs (off-site).

Registered Monuments: As Section 6 highlights, there is one national archaeological monument located in Kharaton village within the Ramitan district ca. 230m West from pumping station no.2. As noted in Section 9, a meeting of the Scientific and Expert Council was held in December 2024 (No. 02-11/85, Minutes No. 22 referring to Letter No. 04-KM/2248), which confirmed the following:

'Having comprehensively studied and discussed the agenda issues, the Scientific and Expert Council decides: 109. To approve the sewerage project in the protected areas of the "Tepa-5" archaeological monument located in Kharaton village, Ramitan mahalla, Ramitan district, on the condition of its implementation under the supervision of archaeology experts… On the basis of Resolution No. 649 of the Cabinet of Ministers dated 15.10.2021, supervision over the implementation of the project work shall be entrusted to the project designer and the Department of Cultural Heritage of Bukara region'.

A copy of the minutes from the December 2024 meeting are provided at *Annex 3.*

It should be highlighted that the proposed Project consists of a wastewater treatment plant, SPSs, an [underground] sewer network, and household sewer connections, which are all located on (or below) land with no historical significance. The project components were subject to a detailed site and route

selection assessment process, as a precursor to this ESIA. In addition, the proposed wastewater treatment plant (WWTP) site is located on undeveloped land with no historical field boundaries and/or heritage assets. The proposed WWTP is located over 4 km southwest from Tepa-5.

Therefore, any impacts on these sites are assessed to be neutral to minor.

In addition to archaeological experts being a core part of the Project Team, 'Buffer zones' will be created for Tepa-5 in accordance with Paragraph 333* of the ShNK (No. 2.07.01.-03 dated 23.12.2009), which states that the distances from cultural heritage objects to transportation and engineering communications must be at least, as follows:

- *to water supply, sewerage and heat supply networks (except for distribution networks) - 15 m;*
- *to other underground engineering communications - 5 m;*
- *In case of reconstruction these distances to engineering communications can be reduced, but they must be at least: to supply networks - 5 m; to non-supply networks - 2 meters.*

Therefore, as a result of various mitigation measures it is assessed that there will be no significant effect or impact on heritage assets.

Direct effects on sub-surface archaeological remains and above ground unregistered historic structures of architectural and historic interest

Any groundworks have the potential to directly affect currently unknown buried archaeology, unregistered earthworks, unregistered built heritage structures of historic interest. Without mitigation, the significance of this impact on these unregistered heritage assets could range from neutral to major adverse. All major sub-surface groundworks associated with the Project's construction works phase will be subject to a programme of archaeological monitoring, under the supervision of archaeology experts, as part of the overall environmental monitoring and in accordance with the Scientific and Expert Council's recommendations from December 2024.

As a result of the planned mitigation measures, i.e. archaeological monitoring with archaeology experts on-site, the significance is reduced and could range from neutral to moderate.

Operation

No potential effects are expected on cultural heritage / archaeology during operation.

10.2.7 Biodiversity

This section identifies potential impacts on biodiversity during construction and operation as a result of the project and provides mitigation measures to reduce potential significant effects.

Construction

Loss of habitat & trees

The Pipeline network is almost entirely within urban areas and therefore loss of habitat is not expected. At the WWTP site, the site is a greenfield site, and surrounding land use is agricultural land. As mentioned in Section 6.4, the site does not contain trees or shrubs. Given this, there will be no significant impacts related to habitat loss.

Loss/disturbance to species & sites of conservation interest

The nearest protected area is the Paykent Natural Monument, located approximately 12.7 km northeast of the Project area. Given the distance, and absence of a pathway to this site (taking into consideration the source-pathway-receptor model) potential impacts on this protected area and the flora and fauna of conservation interest therein are marked as low risk and significance of impacts is considered to be neutral.

An ecological monitor will be present during works to avoid potential impact to any unrecorded species.

A walkover survey will be carried out within the project area at preconstruction phase and coordinate data of any identified areas of conservation interest and habitats will be noted in a registry as identified in Annex 12 and mapped. Flora seeds of any identified species of conservation interest will be collected and sent to the gene bank. All activities such as transportation/seed collection for these species will be carried out according to the methods to be determined in the Biodiversity Management Plan. In critical fauna areas, live control will be carried out and the species will be moved to the area compatible with the habitat.

In addition, in order to prevent the transport of alien species in these areas, it will be ensured that the wheels of all vehicles will be cleaned prior to reaching these areas. All vehicles working in the vicinity will be washed carefully.

Operation

Changes to the aquatic environment

As described, the WWTP effluent will discharge to the Central Bukhara collector (Zarafshon river). The water quality testing demonstrated a degree of contamination at the collector. As mentioned in Section 6 and Section 10.2.3, the effluent will be in line with national fishpond standards and is the output from a WWTP that includes tertiary treatment. The quality of the output is therefore considered to be such that it will not result in significant negative effects to the receiving environment (as explained in Section 10.2.3, tertiary treatment is required where the effluent discharges into sensitive aquatic ecosystems), impact as a result of the introduction into the environment of the effluent is thus expected to be minor. As described monitoring of water quality will be carried out as part of the ESMoP to ensure that the effluent is in line with license requirements and that the water quality does not deteriorate.

10.2.8 Material Assets

10.2.8.1 Waste Management

This section assesses the potential impacts of construction and operation of the Project on waste, with a view to proposing appropriate mitigation measures to mitigate any significant impacts identified.

Construction

Risk of Waste Generation and Improper Disposal

During the construction phase, there will be various types of waste generated from site preparation, excavation, building construction, and operation of temporary facilities. These include vegetation, soils, packaging materials, used containers, hazardous materials (refer to Table 10.3). Without implementation of a site specific WMP, improper disposal of construction waste could lead to environmental pollution, cumulatively affecting other environmental receptors such as land, water, and air quality.

Vegetation and soil from site clearance could be disposed of improperly, potentially causing habitat disruption or contamination if not managed correctly. Packaging materials, such as plastics, could litter the site or be disposed of in landfills without recycling, contributing to waste accumulation. Hazardous waste such as used containers for chemicals or paints, if not properly handled, could run-off into the environment and contaminate local water sources, soil, and air.

In the absence of mitigation, these waste streams could result in moderate impacts on the surrounding environment, affecting both terrestrial and aquatic ecosystems.

Mitigation Measures

To mitigate these impacts, a Waste Management Plan (WMP) will be implemented during the construction phase, detailing waste minimisation and management procedures. This will include waste separation, recycling, and safe disposal methods. For instance:

- Vegetation and timber will be removed from the site by a licensed contractor and is recommended to be recycled.
- Construction materials such as concrete, wood, and scrap metal will be recycled or reused where possible. Surplus concrete can be repurposed for blinding layers or used as hardcore.
- Hazardous materials, including used containers for chemicals, paints, and solvents, will be collected in designated, secure storage areas and disposed of through licensed waste disposal contractors.
- Packaging materials will be segregated and recycled where feasible, with non-recyclable items sent to a landfill that complies with relevant regulations.
- Waste generated from the operational phase, including office rubbish, any canteen refuse, and sewage, will be collected in covered skips and transported to a licensed waste disposal site. Sewage waste should be managed through chemical toilets, ensuring that waste is emptied regularly by an appointed contractor.
- Emergency procedures will be outlined in the detailed Construction Environmental Management Plan (CEMP), ensuring all personnel are trained in waste management practices and mitigation measures.

The waste types and quantities that will be generated during construction will depend on the construction engineering requirements to deliver the WWTP, SPSs and network infrastructure, however, the general waste streams that could be produced during the construction phase are summarised in Table 10.3. The CEMP will further inform Table 10.3 to include expected volumes of waste and applicable waste hazard classes and will be in line with the conclusions of the State Ecological Expertise, in their “positive conclusion to the Draft EIS” issued in October 2023 (see *Annex 2*), as outlined in Section 5.5.4.

Table 10.3. Typical waste types generated during the construction phase

Activity	Waste Type	Waste Management
Site preparation	Vegetation and Timber	Trees/Vegetation to be felled will be removed as required from the site by a specialist contractor and recycled.
Site preparation	Blacktop	To be determined - Send to a recycling facility off-site.
Site operations	Office rubbish, paper, packaging, canteen refuse	Recycle as much as possible, canteen refuse to landfill.
Site operations	Waste from site	Collect in covered skips and transport to a licensed waste disposal site.
Site operations	Hazardous waste from site	Collect in covered skips and transport to a licensed hazardous waste site.
Site operations	Scrap metal and rebar	Transport to recycling facility
Site operations	Sewage	Toilet waste emptied regularly replaced with chemical toilets. Disposal by appointed waste management contractor
Site operations	Wood	If unable to chip on site, send for recycling to licensed waste transfer facility.
Site operations	Concrete/brick	Re-use surplus for blinding layers, *etc*., or break up for re-use as hardcore.
Site operations	Insulation	Re-use where possible.

Activity	Waste Type	Waste Management
Site maintenance of plant	Workshop waste, e.g. paints, oil, etc.	Collect for recycling, e.g. used oil, or transport to licensed waste transfer station, probably classified as hazardous waste.
Trenching, lowering and laying of pipes	Pumping silty water from excavations	Pump to settlement pit. Make use of 'floc blocks' where necessary to coagulate particles of silt.
Reinstatement	Temporary stone/concrete areas	Transport to waste exempt site or Re-use surplus for blinding layers, etc., or break up for re-use as hardcore.

The District authorities have determined some areas for depositing waste from construction. However, the waste management plan of the Contractor may suggest more stringent waste management and depositing procedures and areas, if needed.

There will be possibilities for re-use of clean non-hazardous excavation material as infill on the site or Project boundary or potentially in landscaping works. Prior to use, appropriate testing to ensure material is suitable for its proposed end use will be carried out by the Contractor.

It will be ensured that the amount of waste and disposal facilities will be recorded, taking into account the type of waste, see an example of a waste registry in *Annex 13*.

With the proposed mitigation measures in place, the potential residual impact is considered to be neutral, as waste will be minimized and appropriately managed.

Operation

Waste Generation and Disposal Risks

During the operational phase of the WWTP and SPSs, various waste streams will arise, including screenings, sludge, spent chemicals, grease and oil, and residual water. If these waste streams are not managed and disposed of correctly, there is a risk of environmental contamination of various environmental receptors, primarily water and soil.

For instance, screenings removed during the preliminary treatment process, which could contain plastics and other debris, must be disposed of at a licensed waste facility. Secondary and tertiary sludge from the biological and advanced treatment units will require proper disposal, often through anaerobic digestion, dewatering, or land application. Residual water from the dewatering process must be reprocessed to avoid contamination of water resources.

Mitigation Measures

To minimise environmental impacts from waste during the operational phase, the WWTP will adhere to the WMP, which ensures that all waste generated from the wastewater works is managed in a sustainable manner. Recommended waste management practices include:

- Screenings will be removed and transferred to a licensed waste transfer facility for proper disposal;
- Sludge from the biological and tertiary treatment processes will be managed through anaerobic digestion, composting, or other environmentally friendly disposal options such as land application;
- Spent chemicals from processes like disinfection and pH adjustment will be neutralised and disposed of according to regulatory standards.
- Grease and oil will be collected and disposed of *via* landfilling.

- The residual water from sludge dewatering (supernatant) will be returned to the treatment process or reprocessed as necessary.

The WMP will promote best practices for waste management, ensuring that all generated waste is disposed of in compliance with regulatory requirements and in a manner that minimises any adverse impacts on the environment.

As part of the Ramitan site WMP, residual sewage sludge should be recycled and reused, contributing to sustainable practices and minimising waste disposal. This aligns with the project's goal of reducing the overall environmental footprint and promoting circular economy principles by reusing materials where possible.

With these primary measures in place, the risk of contamination from waste during operation is considered to be low, and the residual impact is considered neutral, as waste will be handled and disposed of in a controlled, environmentally sustainable manner.

By adopting these waste management measures during both construction and operation, the project will minimise its waste generation and potential environmental impacts, ensuring that all waste streams are handled responsibly and in line with best practice.

10.2.8.2 Traffic and Transportation

The following sections describe the traffic and transportation impacts associated with the Project, and a summary including mitigation measures.

Construction Phase

During the construction phase, there will be various types of traffic movements to and from the proposed WWTP, which have the potential to impact traffic and transport in the project vicinity. Increased vehicle activity including the movement of heavy machinery, construction materials, and worker transportation, may lead to congestion, delays, and potential safety hazards, particularly at the entrance of the access road to the WWTP (see Figure 6.15). As a result, there may be very localised temporary traffic works in place which could potentially disrupt local traffic flow. However, this is expected to result in no or minor temporary impacts considering the semi-rural location of the proposed works. Additionally, the transport of large or bulky equipment may require specialised vehicles or infrastructure adjustments, further exacerbating transport challenges during the construction phase. Therefore, there is the potential for temporary negative effects on traffic and transport as a result of the construction phase.

Therefore, there is the potential for temporary negative impacts on traffic and transport as a result of the construction phase.

Mitigation Measures

The following mitigation measures will be implemented to ensure negative effects on traffic and transport are minimised:

- Local people and Mahalla chiefs will be informed about traffic and road safety;
- All drivers and operators working on the project will be required to have the appropriate class of driver's license and/or operator authorization;
- The speed limit for all vehicles and construction equipment at village crossings is 20 km/h. Speed signs displaying the specified speed limit will be placed at the entrances and exits of the work and construction site. Workers and all personnel will be informed about the speed limit;
- As long as vehicles and construction equipment do not pose a risk in terms of safety, they will park backwards in the direction of the exit to the designated construction equipment parking area;

- Periodic maintenance programs for construction machinery and work equipment in line with the manufacturer's instructions are created by the occupational safety specialist will be applied and followed;
- Project vehicle traffic will be mobilised at off peak times in order to reduce the traffic load on the existing network and minimise the risk of possible accidents. It will be ensured that roads that are operating within their capacity are used to reach the quarry to avoid traffic congestion issues;
- The construction site will be hoarded and speed limits will be placed on the main road connection.

Operational Phase

The operational phase itself will generate low to no traffic movements. The operational discharges from the proposed WWTP in themselves do not generate any traffic movements. There will be routine traffic movements to and from the proposed WWTP including worker transportation and haulers going to and from the site for the delivery/removal of site maintenance equipment or sludge removal as required, however, this will not result in congestion or delays to and from the access roads. Therefore, no potential negative significant effects on the transport network and traffic are anticipated during the operational phase.

Mitigation Measures

As potential temporary negative effects on traffic and transport were identified during the construction phase, appropriate mitigation measures include:

- Traffic management plans: Implement clear signage, detours, and traffic control to minimize disruptions and ensure safety.
- Dedicated transport routes: Designate specific routes for heavy machinery and material transport to minimise impact on local roads.
- Use of smaller vehicles: Use smaller, more manoeuvrable vehicles to transport equipment and materials to reduce congestion and road wear.
- Public communication: Inform local communities about construction schedules, potential disruptions, and alternative routes in advance.
- Dedicated construction workforce parking: Establish off-site or designated parking areas for construction workers to minimise local parking congestion.

In the absence of potential negative significant effects on the transport network and traffic itself during the operational phase, there is no scope for mitigation.

Table 10.4. Environmental Risks and Impact Assessment Summary

Potential Impact	Construction/ Operation	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
Climate										
GHG emissions	Construction	Adverse	Local	Short term	Direct & Indirect	Temporary	Irreversible	Moderate	CEMP	Minor
Integrated water resources management	Operation	Beneficial	Regional	Long-term	Direct	Permanent	Irreversible	Major	N/A	Major (beneficial)
Reduction of GHG emissions	Operation	Beneficial	Local	Long term	Direct	Permanent	Irreversible	Major	N/A	Major (beneficial)
GHG emissions	Operation	Adverse	Local	Long-term	Indirect (Scope 2 emissions)	Permanent	Irreversible	Minor	Design measures (embedded mitigation)	Minor
Increased awareness / capacity-building in climate resilience	Operation	Beneficial	Local, Regional, National	Long term	Indirect	Permanent	Irreversible	Major	Communication with key stakeholders on key data sets	Major (beneficial) + SDG13
Soil and Geology										
Loss of soil	Construction	Adverse	Site	Short Term	Direct	Temporary	Reversible	Neutral	N/A	Neutral
Soil sealing	Operation	Adverse	Local	Long Term	Direct	Permanent	Irreversible	Minor to Neutral	None	Minor to Neutral
Soil erosion and Siltation	Construction	Adverse	Local	Short-term	Direct	Temporary	Reversible	Minor	Schedule construction during the period when the drainage collector is at its lowest volume. During the drainage collector civil works, silt fencing mechanisms, including physical cofferdams will be implemented, as required.	Neutral
Water										
Potential surface water contamination	Construction	Adverse	Local	Short-term	Direct	Temporary	Reversible	Moderate	Storage of hazardous liquids/materials in bunded areas Refuelling of plant and vehicles, off site.	Neutral

Potential Impact	Construction/ Operation	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
									Spill kits and hydrocarbon adsorbent packs. Training of personnel in the use of this equipment. Risk assessment prior to wet concreting. Wash down and wash out of concrete transporting vehicles will take place at an appropriate facility off site. Emergency response procedures to be detailed in the CEMP and all personnel working on site will be appropriately trained.	
Potential contamination from improperly managed wastewater produced from the worker accommodation camp and facilities	Construction	Adverse	Local	Short-term	Direct	Temporary	Reversible	Moderate	Temporary wastewater collection systems will be established in camp areas and construction sites and waste will be collected in impermeable septic tanks. The collected wastewater will be extracted by vacuum trucks and transported offsite by a licenced contractor for treatment at the nearest Wastewater Treatment Plant.	Neutral
Potential contamination of surface/groundwater from leaking pipes transporting raw sewage.	Operation	Adverse	Local	Short-term	Direct	Temporary	Reversible	Moderate	Use of PE pipes.	Neutral
Termination of operation of individualised systems and	Operation	Beneficial	Local	Long term	Direct	Permanent	Irreversible	Major	Not applicable	Major (Beneficial)

Potential Impact	Construction/ Operation	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
therefore risk of regular spillage/leakage events throughout the town.										
Impact on water quality from discharge effluent from the WWTP	Operation	Adverse	Local	Long term	Direct	Permanent	Reversible	Minor	Mitigation embedded in design	Minor
Surface water runoff from the WWTP	Operation	Neutral	Local	Long term	Direct	Permanent	Irreversible	Neutral	Petrol interceptors and silt removal if there is a risk of pollution from fuel spillages or silt discharges	Neutral
Impacts on groundwater	Operation	Beneficial	Regional	Long term	Direct	Permanent	Reversible	Major	Use of PVC pipelines; WWTP including tertiary treatment	Beneficial
Air Quality										
Construction dust emissions	Construction	Adverse	Local	Short Term	Direct	Temporary	Reversible	Medium to High Risk	CEMP / ESMP	Minor to no significant effect (neutral)
Traffic emissions from construction vehicles	Construction	Adverse	Local	Short Term	Direct	Temporary	Reversible	Minor to Moderate	CEMP	Minor to no significant effect (neutral)
Dust Nuisance	Operation	Adverse	Local	Long Term	Direct	Temporary	Reversible	Low Risk	Standard, best practice measures	No significant effect
Traffic emissions from maintenance vehicles	Operation	Adverse	Local	Long Term	Direct	Temporary	Reversible	Low Risk	Standard, best practice measures	No significant effect
Odour	Operation	Neutral	Local	Long term	Direct	Permanent	Reversible	Neutral	Embedded measures	Neutral
Noise										
Construction noise & vibration	Construction	Adverse	Local	Short Term	Direct	Temporary	Reversible	Moderate to Major	ESMP	Minor to moderate
WWTP Equipment Noise (e.g., blowers, progressive, cavity pumps, centrifuge decanter)	Operation	Adverse	Local	Long Term	Direct	Permanent	Irreversible	Minor	Compliance with the Noise Standard limit in the Schedule of Performance Standards Engineering design abatement measures for noisy equipment items	Minor

Potential Impact	Construction/ Operation	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
Archaeology and Cultural Heritage										
Damage to heritage assets	Construction	Adverse	Local	Long Term	Direct	Permanent	Irreversible	Minor to Moderate	Manual trenching in areas where there are narrow streets to avoid damage as far as practicable Conclusion of the Uzbekistan Archaeological authorities of Uzbekistan require that an "Archaeological Supervision Report" be prepared and approved prior to construction commencement, in order to avoid and mitigate any potential adverse impacts. It is recommended that this be prepared by the PMC, to ensure consistent protection and supervision measures are handled directly between PMC/Employer and Construction Contractor.	No significant impact
Direct effects on sub-surface archaeological remains and above ground unregistered historic structures of architectural and historic interest	Construction and maintenance operations where applicable	Adverse	Site	Long Term	Direct	Permanent	Irreversible	Neutral to High	Implementation under the supervision of archaeology experts Chance Find Procedures are in place as part of ESMP	Neutral to Major
Biodiversity										
Loss of habitat & trees	Construction	Adverse	Site	Long Term	Direct	Permanent	Reversible	Major (if loss of trees cannot be avoided)	Compensatory Planting Translocation to an alternative site may be possible through approval of District Environmental Department. Similar	Moderate to Major

Potential Impact	Construction/ Operation	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
									approvals for trimming of trees to be obtained. Uzbekistan' legal moratorium on tree cutting shall be followed.	
Loss/disturbance to species & sites of conservation interest	Construction	Neutral	Site	Long Term	Direct	Permanent	Irreversible	Neutral	N/A	Neutral
Changes to the aquatic environment	Operation	Adverse	Local	Long Term	Direct	Permanent	Reversible	Minor	N/A	Major (Beneficial)
Waste Management										
Risk of Waste Generation and Improper Disposal	Construction	Adverse	Local	Short Term	Direct	Temporary	Reversible	Moderate	Waste Management Plan	Neutral
Waste Generation and Disposal Risks	Operation	Adverse	Local	Long Term	Direct	Permanent	Irreversible	Moderate	Waste Management Plant	Neutral
Waste Reuse and Sustainability	Construction & Operation	Neutral	Local	Long Term	Direct	Permanent	Reversible	Minor	Waste Management Plan following the 3-R's to be implemented before	Neutral
Traffic and Transportation										
Increased traffic to WWTP Site	Construction	Adverse	Local	Short Term	Direct	Temporary	Reversible	Minor	CEMP District authorities have selected roads to be used by all Contractor vehicles entering/exiting sites	Minor
Site Operation and Maintenance Traffic	Operation	Adverse	Local	Short Term	Direct	Permanent	Irreversible	Neutral	N/A	Neutral

10.3 Social Risks and Impact Assessment

The following sections describe and assess the potential social risks and impacts associated with the Ramitan Project and a summary, including mitigation measures and residual impacts, is provided at the end of this section as Table 10.6. The following social risks and impacts are examined and assessed below along with proposed mitigation measures, where required:

1. Human/Public Health
2. Land Acquisition and Site Clearance
3. Property and business access
4. Public safety
5. Damage to existing structures
6. Income and Employment
7. Gender Equality
8. Occupational Health & Safety
9. HIV/AIDS and Human Trafficking
10. Labor Influx and Management

10.3.1 Human/Public Health

The Ramitan Project will replace the current use of cesspools and septic tanks, which are a significant health hazard as reported in the Proceedings of the 24th International Multidisciplinary Scientific GeoConference (SGEM) 2024[32]. As reported in the Proceedings, water pollution from untreated wastewater discharge is a major public health concern in the Bukhara Region.. The absence of adequate wastewater treatment facilities has led to the release of contaminated water into the environment. This has resulted in the deterioration of water quality in local water bodies, posing serious risks to human/public health, particularly children.

One of the primary sources of pollution is the discharge of domestic and industrial wastewater into canal water. Canal water is used for irrigation purposes in surrounding agricultural areas, facilitating the spread of waterborne diseases. Microbiological and chemical analyses have revealed high levels of pathogens, heavy metals, and other pollutants in the canal water. As a result, the local population has experienced an increased incidence of waterborne diseases, such as acute intestinal infections, viral hepatitis A, and typhoid fever. Children are particularly vulnerable due to their higher exposure and weaker immune systems. The Proceedings emphasised the need for urgent action, including the construction of modern wastewater treatment facilities, enforcement of environmental regulations, and public awareness campaigns on proper sanitation practices.

Pre-construction Phase

The Ramitan Project directly aims to address the source of water pollution and will have a permanent, moderate to major beneficial impact on the overall human health and well-being of the regional and local population, particularly children.

As noted above, the Project is linked to the delivery of UN SDG13 Climate Action and UN SDG6 Clean Water and Sanitation – this also has a wider permanent benefit as the local population will be empowered in relation to overall water sanitation and water management in a rapidly-developing urban

[32] Ed. Trofymchuk, O., Rivza, B. 2024. The Impact of Wastewater Emissions on the Health of the Population of Bukhara, Uzbekistan. Proceedings of 24th International Multidisciplinary Scientific GeoConference SGEM 2024

area. For example, the Project in Ramitan will support the delivery of numerous UN SDG6 Targets, as listed in Table 10.5 below.

Table 10.5: Project Benefits and Impacts - Delivery of UN SDG6 Targets

SDG6 Target No.	Target Heading	Description
6.2	End Open Defecation and provide Access to Sanitation and Hygiene	By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.
6.3	Improve Water Quality, Wastewater Treatment and Safe Reuse	By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.
6.7	Expand Water and Sanitation Support to Developing Countries	By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.
6.8	Support Local Engagement in Water and Sanitation Management	Support and strengthen the participation of local communities in improving water and sanitation management.

Construction Phase

Construction of the Pipeline will be directly within the road network, close to residences and, at times, restricting traffic entry. Also, pedestrian access will be affected and will need special management around each construction site for access and safety during daylight and night-time hours.

The planned wastewater treatment plant (WWTP) is located on a vacant site outside of the urban area, and, as assessed, significant impacts in relation to noise and odour during operation are not expected.

Mitigation Measures

Pollution prevention measures will be implemented as part of construction environmental mitigation measures and Noise, Water and Air monitoring will be undertaken in partnership with local stakeholders. This monitoring will ensure that known risks can be assessed, and preventative actions taken, if required. In addition, any road closures will be publicised as part of the wider Stakeholder Engagement Plan.

The construction phase (pipeline only) will have a moderate impact on public health, mainly in relation to upheaval and inconvenience during times of road closures, etc.

It will be ensured that the drinking water consumed in the camps complies with hygiene conditions. Drinking water needs for the workers will be met using water carboys or glass water or purified tap water.

The construction site will be fenced to prevent and detect theft, vandalism and other crimes, to ensure that possible security breaches are quickly detected and to help ensure the safety of employees.

Relevant recruitment of security personnel for the security of construction sites and sites will be implemented to further ensure the safety of the workers.

All personnel will only be allowed to enter from the designated entrance area.

Operation Phase

As noted above, it is envisaged that the Ramitan project, which includes digital control systems (e.g. a SCADA system), will result in significant enhanced urban and climate resilience in an area identified by

the World Bank Group in 2023 as at 'high-risk' for climate change. The Project will also promote the delivery of UN SDG6 in Uzbekistan and the Bukhara Region and improve the health and well-being of the local population, particularly children.

Overall, there will be a permanent, major beneficial impact on human health and the regional and local population, as a result of the Project implementation. There will also be a likely positive impact in terms of equitable hygiene and mental health, particularly among women and girls and those in vulnerable situations.

10.3.2 Land Acquisition and Site Clearance

10.3.2.1 Pipeline selection

Pre-construction/Construction Phase

As noted above, at this stage a preferred alignment for the project pipeline has been assessed and proposed through the detailed design and site selection process, which was approved by the Expert Conclusion in August 2023. Community consultation will be continued throughout the Project to ensure actual construction reduces impacts on the community members and that any designated cultural heritage sites are avoided (e.g., access and community safety near to trench excavations, dust, noise and mosques etc). A medium risk rating is assigned. It is assessed the Project will have a minor to moderate adverse impact (temporary).

Mitigation Measures

A Stakeholder Engagement Plan shall be prepared and included as part of the ESIA/ESMP to address this issue and reduce residual impacts.

Temporary land acquisition may be required for construction camps, stockpiles and workshops. In such cases, if agricultural soil is present in the areas, approximately 30 cm of soil will be stripped and stored in piles.

The project will have a minor adverse impact (temporary) if the mitigation measures are successfully implemented.

10.3.2.2 Land Acquisition and Site Clearance

Pre-construction/Construction Phase

According to the Ramitan SDDR, "*Permanent land acquisition is needed only for the sewage pump stations (normally not more than 0,025 ha sites), including MPS (0.21 ha site), and for the WWTP (4.54 ha site) to be developed at the sites allocated from the vacant and contingency land category. The issues of land allocation have been resolved at the level of the Cabinet of Ministers of the Republic of Uzbekistan and the Bukhara Region Hokimiyat. Land plots for SPSs and WWTP have been transferred to the balance of Bukhara Suv Ta'minoti JSC".*There are no informal land users on the lands selected for construction of sewerage facilities under the project.

The feeding pressure main and the discharge gravity sewer are routed across the lands of the Tukhtamurod Private Farm. As included in the SDDR, '*Pressure pipeline to the WWTP and discharge pipeline to the drainage canal is routed through the land of a corn-growing farm. Bukhara Suv Ta'minoti JSC, as a temporary user of the land, entered into agreement with the farm. The agreement establishes an easement on the land plot allocated for the pressure main and the discharge pipeline, and the right of the "Temporary Land User" to limited use of the land plot'.*

The central sewer system is to be implemented in the area with dense residential development. Social screening of the spatial location of streets, roads, private individual houses showed that households

dispose of their wastewater outside their properties using septic tanks along the edges of streets and roads. Since this practice is common throughout the town, and sewer lines will run along the edges of roads and streets, it is likely that septic tanks of some households may be located within a construction site. A medium risk rating is assigned.

Temporary land acquisition may be needed for construction camps, stockpile sites and workshops. However, this will depend on the contractor, who may decide to rent space or provide Government unoccupied land, organized by the employer/client. Therefore, a medium risk exists, as the contractor will be able to rent out the space, as per market demand, and through a negotiated settlement (this type of acquisition is by mutual agreement).

Impacts may also occur along the transport routes, where trucks may be a safety hazard and, in the case of larger vehicles and transporting of large equipment to sites, may lead to temporary impacts to enable trucks to drive safely through village areas. Most residences and businesses are temporarily affected by construction and, through consultations conducted, it is understood that businesses in the project area rely on local customers (neighbours) and not “passer-by’’ customers.

Also, the construction of pipelines within the road alignments will be very deep (over 1.5 metres) and may require road closures and detours along local streets. The local roads, where the Project pipeline will be constructed are mostly 2-lane or single-lane roads, where access to residences and local shops may be limited for a set number of days. This should be in 500-metre lengths (maximum) and trenches left open a maximum of 3-5 days. Access to houses and shops must be every 20-50 metres with barricades as per Uzbekistan legal standards installed.

It is assessed that the project will have a minor to moderate adverse impact as a result of temporary land acquisition and site clearance.

Mitigation Measures

A Stakeholder Engagement Plan shall be prepared and included as part of the ESIA/ESMP to address this issue and reduce any potential residual impacts.

During Pre-Construction phase a Site Survey Study will be conducted to consider sensitive receptors present on RoW and near vicinity, then a list and a map of the overall sensitive receptors of the projects across all aspects (air pollution, noise, water quality, biodiversity at minimum) along with respective distance to project location, will be prepared.”

As mentioned, temporary land acquisition may be required for construction camps, stockpiles and workshops. In such cases, if agricultural soil is present in the areas, approximately 30 cm of soil will be stripped and stored in piles.

In all areas to be rented and in areas where permanent expropriation will be carried out; critical species inspections will be carried out. Identified flora and fauna species will be recorded. All activities such as transportation/seed collection for these species will be carried out according to the methods to be determined in the Biodiversity Management Plan.

For all areas to be rented and areas to be permanently expropriated; the decision for all areas to be used temporarily will be made by the employer and / or client. The Contractor shall ensure that the areas found suitable by the employer and / or client are rented or temporarily allocated by the State for the work.

Due to the lease of space organized by the Employer/Client; such acquisition is by mutual agreement and is not classified as involuntary resettlement. It will result in a Low or Medium risk of impact.

The project will have a minor adverse impact (temporary) if the mitigation measures are successfully implemented.

10.3.2.3 Regulations and Permits

Pre-construction/Construction Phase

The Legal framework (refer to Section 5) outlines the environmental and social assessment laws, policies, processes, stakeholder institutions and permits required for implementing the Project in Ramitan.

The assessment estimated that this deliverable is a medium risk rating due to the following:

- Obtaining permits for construction and operation will take time out of the construction and commissioning schedule.

iv. There is a legal requirement for a Final EIS / Statement of Environmental Consequences (ZEP) to be completed after construction but before Commissioning/operation.

v. With the Draft EIS (ZVOS) and the ESIA with ESMP, the legal standards are provided for the contractor and all stakeholders to comply, leading to an easier ZEP, with less variations ordered by the State Environmental Expertise.

Any delay and/or failure to obtain correct permits, comply with Uzbekistan standards (and AIIB policy) and abide by the environmental assessment laws of Uzbekistan, will result in legal action against individuals and/or responsible government agencies and/or contractors.

All permits to be obtained within the scope of the project will be recorded. A sample list of records is available in *Annex 14*.

A medium risk rating is assigned, with a minor moderate impact during the construction phase.

Mitigation Measures

A Stakeholder Engagement Plan shall be prepared and included as part of the ESIA/ESMP to address this issue and reduce any potential residual impacts.

In addition, the Contractor shall prepare a summary Regulations & Permit Plan as part of the CEMP in partnership with the relevant regulatory bodies to ensure that there is sufficient forward planning with the regulatory authorities for each phase/construction site.

The project will have a minor beneficial impact (temporary) if the mitigation measures in relation to regulations and permits are successfully implemented due to an accrual of economies of scale and repetition and enhanced systems.

10.3.3 Property and business access

Construction Phase

Access in the locality of the Project may be temporarily interrupted during construction, especially in some limited areas where there are urban/peri-urban and rural communities, as well as access to crops for harvesting in farm areas. Temporary impacts are, as follows:

Obstruction of access to businesses with temporary loss of livelihood will result in a short-term moderate temporary impact.

People will not be able to travel to work, study or go to market through the construction sites. Impact will be short term, a significant but very short-term impact. However, access will need to be provided for pedestrians to access around the construction sites. - moderate temporary impact.

Depending on location of the social sensitive receptors' access to social services/facilities such as schools, mosques, clinics, hospitals, water points, etc. will be temporarily disrupted resulting in a moderate to major temporary impact.

Some carry over loss of trade for businesses, but most businesses in the project area rely on locally based households and not passing traffic. The level of disruption to these sensitive receptors will likely result in a minor temporary impact.

Community fears and perception that they will not be allowed back to their original site from where they were relocated during construction is also considered. The planned Pipeline is mostly in easements and/or within road alignments and the overall design does not foresee the removal of major structures for the construction and operation phases of the pipeline network.

Mitigation Measures

Effective stakeholder consultation should help to alleviate misconceptions resulting in a minor temporary impact.

In addition, a minor impact may occur due to the Project in cases of location-specific maintenance, which will be temporary.

Operation

The Project will not have any impact in the operation phase – i.e. neutral in relation to property and business access.

10.3.4 Public safety

Construction Phase

Construction of the pumping stations and wastewater treatment plant will directly impact road safety and pedestrian safety, through an increase of dump trucks, materials delivery and construction equipment movement around project sites plus camps and workshops. This may impact also on the need for road closures for a few hours at a time.

This category of potentially significant socio-economic construction impacts is associated with risks arising during construction activities and increased traffic movement for residents of the district centre.

During construction in the district centre and on highways, the volume of vehicles is expected to increase as raw materials, waste, personnel, and equipment are transported to and from construction sites. This will inevitably elevate the risk of accidents for road users, including pedestrians and drivers. These risks are further exacerbated by the lack of sidewalks, proper road signs, and markings. This risk is assessed to be low to medium and the significance of the impact is assumed to be minor to moderate.

Since construction activities are planned to take place within densely populated residential areas, where buildings are located close to each other, the primary sources of injury risks are likely to be trenches and construction vehicles.

As highlighted in Section 10.2.1, a preferred alignment for the project pipeline has been proposed through the detailed design. Community consultation will be continued throughout the Project to ensure actual construction reduces impacts on the community members and that any local cultural heritage significant areas of local importance are avoided (e.g., access and community safety near to trench excavations, dust, noise and mosques etc).

Mitigation Measures

Barricades and fencing to the legal standards in Uzbekistan for road traffic, rules for construction vehicles on public roads, and transport management planning will be required, as part of the mitigation measures in the ESMP. As part of the mitigation measures outlined in the ESMP, compliance with Uzbekistan's legal standards, for road traffic regulations governing the use of construction vehicles on public roads, and transport management planning, will also be required.

A strict requirement must be imposed on all suppliers and construction vehicle operators to limit their speed to 30 km/h when passing through residential areas on their way to and from construction sites. This requirement should be included in their contractual obligations, with penalties such as contract suspension and/or termination for non-compliance. Local authorities should also be informed of this obligation so they can assist in holding construction workers and contractors accountable.

All contractors will be required to develop an *Occupational Health and Safety Plan* as well as an *Emergency Preparedness and Response Plan*.

In addition, a Stakeholder Engagement Plan will be prepared and included as part of the ESIA/ESMP to address this issue and reduce residual impacts.

As a result, it is assessed that the Ramitan Project will have a minor residual impact on the local population.

10.3.5 Damage to existing structures

Construction Phase

Within the project pipe network, there are some very narrow width areas, such as (but not limited to): narrow roads, roads with other underground services, and areas where the trenches may be at risk of caving in, due to a high groundwater table and associated soil moisture. Uzbekistan Laws do include “sanitary protection zones” and KMK and GOST codes, that require such things as water pipes to be at least 1.5 metres away from sewer pipe services and sewage pipe is deeper (refer to Section 5.3). There are places in Ramitan, where structures are potentially at risk of being damaged because construction may occur extremely close to them.

This overall risk was given a low to medium risk, because it carries a threat (real or perceived) to communities that would not occur under “no-project” or “project with mitigations” options but would be of high socioeconomic value to the residents in the project area. The potential impact is assessed to be minor to moderate.

In order to reduce the risk, the contractor will conduct a “[*Building] Crack Survey*” prior to commencing construction works; using reduced vibrating construction equipment (*i.e.,* oscillation rollers and vibrating plates) and manual hand digging, where depths are less than 1.3 metres. Working practices can be adjusted based on this monitoring.

The Contractor shall also possess Third-party insurance, whereby insurance claims will assist in payment for structure and structural damages in the event that they are caused directly by the construction of the Project.

The residual impact is assessed to be of minor significance.

10.3.6 Income and Employment

Construction Phase

The Project will create income and employment opportunities during the construction phase – this will result in a beneficial impact if the contractor trains and employs local labour, particularly for workers who have been unemployed for six months or more. Employing local labour will have a minor (due to the scale of employment) significant positive impact due to the overall ‘M*ultiplier effect’* on the local economy, i.e., workers’ salaries and income will remain in the local area and will be spent on local goods and services. This will have a positive impact on the local area’s standard of living and reduce the level of low-income and vulnerable households in the Ramitan Region.

Mitigation Measures

Mitigation measures will include a transparent and publicly communicated recruitment/hiring policy and the ESMP. The residual impact if best practice recruitment will be moderate beneficial to the local and

regional population. The Contractor should prioritize the procurement of goods and services locally, wherever feasible and appropriate.

In addition, the overall phasing of the project is important in order to support the agriculture and agri-food sector, which is an important source of employment in the area. There is a minor adverse impact if the construction works are phased around the farming calendar. There will also be a minor to moderate positive impact on skill levels in both locally recruited workers and those from outside of Ramitan. This will enable those workers to increase skills they offer and can be employed subsequently, although not necessarily in the local area. It may also lead to a negative impact of increased potential for Human Trafficking incidents. Mitigation through training of workers in HIV/AIDS and Human Trafficking prevention, will reduce this impact risk significantly.

The following recommendations will be implemented for workers safety and labour management:

- Working time is generally limited to a maximum of working hours defined in Uzbekistan Legislation. The start and end times of the daily working hours and the break times will be notified to the workers.
- A rest area will be created for workers to use during break times. The top of rest areas will be covered.
- Tea, coffee and water facilities will be available in rest areas. Breaks will be intermittent, taking into account climatic and seasonal conditions and local habits.
- Workers will be informed about their right to complain. Complaint boxes will be placed in the rest areas and kitchen.
- The dormitories in the camp area will be organized to meet the required space and air volume per person as much as possible.
- Local employment rate will be determined by working together with the PCU.
- It will be ensured that local personnel will be recruited starting from the directly affected neighborhoods.
- While employing local staff, priority will be given to PAPs identified in the SDDR.

Operation Phase

During operation, a maximum of 13 persons would be needed to operate WWTP and SPSs and 10-40 persons will be required as construction labourers.

There will be major adverse impact if the works contractor employs underage labor and if migrant workers are the result of Human Trafficking (see Section 10.3.9 below).

Mitigation Measures

Mitigation measures will include a transparent and publicly communicated recruitment/hiring policy and the ESMP. All staff recruitment processes will be carried out in compliance with the AIIB ESS2. The residual impact if best practice recruitment will be moderate beneficial to the local and regional population.

10.3.7 Gender Equality

Pre-construction/Construction

The Project has the potential to create significant benefits for the local female population in Ramitan and its environs in relation to enhanced employment opportunities, reduced gender-bias and reduced gender-based violence, i.e., the delivery of SDG5 Gender Equality.

In relation to gender equality, the Project has a specific target of 15% for female employment throughout all phases of the project. The Project assesses gender bias and gender-based violence as set out below.

Gender Bias and Gender-based violence (GBV)

Gender Bias: overall a medium-high significance of risk ranking was given to gender bias. This includes:

- A medium to high risk of favouring male over female hires in the project workplace.
- A medium to high risk of salary differences between men and women that are in the same position, same skills set and education and conducting the same activities.
- A medium risk of inappropriate use of the sewage system, such as disposing of foreign materials in the household sewerage connections and manholes on public land. This risk of disposing foreign materials into the operating sewage network does have the potential for blocking parts of the pipe networks and damaging the SPSs and WWTP.

Women are heavily relied upon and are most effective in maintaining and improving household health and livelihoods. The *Gender Action Plan* (GAP) provides for the participation of women in the Project, without prejudice (equal work and position deserves equal pay, for example). However, to reduce the need of emergency or more frequent maintenance activities on the pipeline, it is recommended that awareness on the use of the sewage networks be provided for all members of the household, ensuring that household connections remain unblocked and foreign material is not put through the pipeline system, causing it to block, add disruption to services and/or require maintenance.

There are also benefits for all family members connected to the sewage network, such as health improvements and less mortality/morbidity in the household, leading to a higher level of productive workdays and income generation for working-age household members. Improved practices of family health, which leads to productive income generation, are generally spearheaded by the women in the household.

Gender-Based Violence (GBV): The inclusion of policies and mitigation measures that prevent and reduce the risk of Gender-based Violence is required to be considered under the AIIB Environmental and Social framework. For this Project, GBV measures follow the policy definitions of AIIB and the World Bank. GBV includes male/female equality in employment, no forced labor and no child labor, among other issues. The risk is ranked as medium because there is a risk that GBV policy might be breached by a contractor, however, this issue is reversible, and a well-resourced *Gender Action Plan* (GAP) will be prepared as part of mitigation. Furthermore, part of the ESMP will contain a specific set of GBV-related mitigation measures and monitoring of Contractor staff on “core labor issues” that relate to Gender.

Mitigation Measures

A beneficial impact will arise from the production and implementation of specially focused plans such as the project *Gender Action Plan*). Such plans will ensure that women and men are employed on an equal basis of income for the same position and activities conducted on the Project, required conditions for male/females in the workplace, regulations and monitoring of contractor and workers to ensure no Female Child Labor is hired for the Project and that there is no forced labor (as per Uzbekistan law, i.e., not less than 16 years old, although international standard is normally not less than 18 years old). The ESMP shall also make provisions for regular training in *Gender Equality*, in accordance with the national policy framework and SDG5.

Therefore, the Project has the potential to have a moderate to major residual beneficial impact if the mitigation measured are successfully implemented.

N.B. The Feasibility Study and focus groups indicate that women are in the least favourable position in terms of formal employment and participation in local government activities. Their access to assets and productive resources is significantly lower than that of men. Despite the existence of formal gender policies in national strategies, key documents fail to account for the differing roles of men and women and the potential impacts of reforms on each gender. The legal framework regarding sanitation is also challenging due to the weak gender and social orientation of certain laws, while staffing shortages and insufficient qualifications hinder the integration of gender aspects in water usage practices.

10.3.8 Occupational health and safety

Construction - Water logging during excavation (Temporary)

This issue may impact on construction in terms of pipelaying, need to dewater the area affected and safety of labour. The contractor, with supervising engineer will need to plan for dewatering (where needed), accounting for seasons, which affect the groundwater level and provide health and safety (H&S) instructions by the contractor to its labour on working in trenches deeper than 1.5 metres and in risky ground water-logged areas. The risk is assessed to be low-medium**,** given that excavation works are planned to take place during the drier seasons**.**

Therefore, the significance of the impact is assessed to be minor to moderate**.**

Mitigation Measures

This category of potentially significant socio-economic impacts of construction is associated with the employment effects of construction activities and the influx of workers. To ensure that the communities most directly affected by the construction of the scheme are the most likely to gain economic benefits from the construction through employment and training, the Contractor must ensure that its hiring policy is fully disclosed to the residents of the district center and open to all local residents, including women.

The Contractor must ensure that its employment policy is accessible and understandable to all employees. Working conditions, including wages and benefits, must be documented and communicated to all employees, who should have access to a grievance mechanism from the moment the contract is signed. Additionally, the company must include a clear statement in its employment policy that it will not use forced labor or employ children. With these proposed improvements, the significance of employment and income benefits from the construction is expected to be minor beneficial.

Overall, the Project will have a beneficial moderate to major impact.

Labor Codes and Working Conditions during Construction (Temporary)

This category of potentially significant socio-economic construction impacts is associated with labor resources and working conditions. However, it is expected that contractors will comply with the Labor Code of Uzbekistan and ensure that all workers have contracts. The project is also expected to adhere to the Labor Code regarding working hours, working conditions, hygiene, occupational safety, and the management of worker relations and grievances. In cases where the Code does not fully cover the scope of working conditions, GIIP (Good International Industry Practice) will be followed.

If management is not conducted in compliance with legislation and GIIP, this could result in significant consequences, including labor disputes, supply chain issues, occupational health and safety concerns, and instances of child and forced labor.

It is anticipated that most unskilled and skilled positions will be filled by men. However, local women will have opportunities for employment in catering, service, and administrative roles. The effect is assessed as minor beneficial. Gender bias and female employment is assessed in the following sub-section below.

Mitigation Measures

The measures to reduce impact are similar to those already outlined above. Contractors will be required to prepare an Environmental and Social Management Plan (ESMP), including a Labor Management Plan and an Occupational Health and Safety Plan, in compliance with the current national labor legislation. Additionally, a grievance mechanism for labor relations must be established and implemented by the contractors.

Contractors must ensure that their hiring process is fully transparent to the public and open to all individuals of working age and abilities, including women. A Code of Conduct must be developed for

construction personnel, and training on environmental and social management measures relevant to workers should be conducted.

Training on community awareness and accountability (including sessions on sexual harassment, health protection, gender sensitivity, and respect for local culture) will be incorporated into the Induction Program for all project contractors and their staff.

In relation to the workers' camps, if required, these will be established and managed in compliance with IFC Guidance Note: Workers' accommodation: processes and standards[33]. Careful consideration will need to be given to any use by Contractors of existing capacity in accommodation and other available local amenities to avoid social tensions between locals and contractors. With the mitigation measures proposed, it is considered that the scheme will have a minor to moderate impact on labour and working conditions. The issue of labor influx and management is examined in the following section (Section 10.3.9).

Overall, the Project will have a beneficial moderate to major impact.

10.3.9 Labor Influx and Management

10.3.9.1 Influx of labor in the project area and workers in camps

Construction Phase

As noted above, the total number of laborers will be the decision of the contractors. However, at any one time, it expected that the SPSs and WWTP would require between 12 and 20 persons. Influx of workers for construction is a concerning risk which covers worker and community health and safety, respectively and, as noted above, Gender Based Violence (GBV). Influx of workers for construction is a concern for both worker health and safety and community health and safety.

The high risk has been assigned due to the possible numbers of specialized equipment and personnel required, compared to pipelines construction, and there may be a higher magnitude of labor for construction. This may be mitigated, to an extent, through implementation of the ESMP, requiring priority given to local labor from Ramitan and Bukhara Region to reduce the risk. However, this would depend on the skills level of the local population and the capacity-building that the contractor may need to do before work can begin in construction, i.e. through training.

This risk has the potential to have a moderate to high impact.

Mitigation Measures

A Labor and Community H&S Plan covering worker and community health and safety shall also be prepared separately to the ESMP requirement.

The Project has the potential to have a minor to moderate beneficial impact on the area if the mitigation measures are successfully implemented.

10.3.9.2 Prioritization of Local Employment

Pre-construction/Construction Phase

As noted above, as much as possible, local community members shall be prioritized for employment (unskilled and, if available, semi-skilled and skilled) above those located in other provinces or internationally. This labor policy not only benefits local communities' employment and capacity development of lower skilled workers but also reduces need for worker influx and its associated social

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

and environmental adverse impacts. During operation a maximum of 13 persons would be needed to operate WWTP and SPSs, which 12-20 persons may be required for construction laborers.

Mitigation Measures

Mitigation measures will include a transparent and publicly communicated recruitment/hiring policy and the ESMP.

Worker Occupational Health and Safety

With all construction projects, Health and safety is a high risk, if H&S rules and regulations, including PPE, are not strictly complied with. Health and Safety on-site will be in accordance with internationally (FIDIC) required and in accordance with the applicable laws of Uzbekistan. The contractor will prepare a Health and Safety Plan, which is a part of the Community and Worker Health and Safety Plan, flagged as a requirement to be developed by the contractor in the ESMP, and will be responsible for its full implementation throughout the contract period: pre-project and construction. They shall also be responsible for health and safety compliance for visitors to the site (including consultants, donor representatives and employer).

The Health and Safety Program shall include, but is not limited to, the following:

- Personal Protective Equipment (PPE)
- Construction site (especially roads, within trenches and around other excavations)
- Workshops regarding safety around construction machinery and trucks by workers and drivers.
- Traffic management safety in Haulage routes, even if already selected
- Plants (concrete, materials processing etc.)
- Safety around gas pipelines
- Chemicals and hazardous materials and waste transport
- Emergency management
- Sexual Harassment
- HIV/AIDS and human trafficking awareness
- Camps health and safety (including injuries, hygiene and food safety)
- Safety around stockpile sites, machines use and borrow Pits/Quarries (if any used).
- On a site such as this Project, the contractor constructing the WWTP, (and SPSs), may be subject to inspection from the State committee on industrial safety of the Republic of Uzbekistan.

Operation Phase

A maximum of 13 people will be required during the day shift of the operation phase and 4 people during the night shift.

Day shift: Guard, director, lab technician, lab chief, electrical technician, SCADA engineer, mechanical technician, plant operator, chief technologist, technologist, compost operator, sludge dewatering operator.

Night shift: guard, electrical technician, mechanical technician, plant operator.

Mitigation Measures

The contractor will prepare a Health and Safety Plan, which is a part of the Community and Worker Health and Safety Plan - separately to the ESMP requirement. This plan will run throughout the contract period i.e. pre-project and construction.

An overall impact assessment of labor influx and management deems that the residual impacts will be adverse minor to moderate and will be of a temporary nature as the majority of labor will be required during the construction phase compared to the operation phase.

10.3.10 HIV/AIDS and Human Trafficking

Construction Phase

As noted above, there are potential risks from conditions created by the Project's construction phase in that they might lead to incidences of HIV/AIDS/Human Trafficking. The number of labourers required is estimated as 12 – 20 workers).

As noted above, the Construction Workers Health and Safety Plan (CWHSP) and ESMP shall also make provisions for regular training in HIV/AIDS and in Human Trafficking prevention, that are culturally and gender appropriate.

The residual impact will be minor adverse and temporary.

Table 10.6 Ramitan - Social Risks and Impact Assessment Summary

Potential Impact	Construction/ Operation/ Decommissioning	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
Human/Public Health										
Lack of engagement of local population in water sanitation & management	Pre-construction & construction	Adverse	Local Regional	LT	Direct	Permanent	Reversible	Moderate to Major (Adverse)	Strengthen participation through ongoing consultation & monitoring.	Moderate to Major (Beneficial) + SDG6
Removal of health risk from raw sewage entering water bodies	Operation	Beneficial	Local	LT	Direct	Permanent	Reversible	Moderate to Major	N/A	Moderate to Major (Beneficial) + SDG6
Land Acquisition and Site Clearance										
Impact on community/landowners due to pipeline construction	Pre-construction/ Construction	Adverse	Local	ST	Direct	Temporary	Reversible	Minor to Moderate (Adverse)	Preparation of Stakeholder Engagement Plan	Minor (Adverse)
Delay to permits and Impact on community	Pre-construction/ Construction	Adverse	Local	ST	Indirect	Temporary	Reversible	Minor to Moderate (Adverse	Preparation of Regulations and Permits Plan as part of ESIA/ESMP	Minor (Beneficial)
Property and business access										
Obstruction of access to businesses	Construction	Adverse	Local	ST	Direct	Temporary	Reversible	Minor to Moderate	Access will be provided during construction phase for local trade.	Minor
Obstruction of access to mosques, clinics, and other social services, etc	Construction	Adverse	Local	ST	Direct	Temporary	Reversible	Moderate to Major	Access will be provided during construction phase for sensitive receptors. Mitigations provide for works to occur outside of regular and special events occurring in these areas	Minor
Public safety										
Injury to the public and residents in the local area	Construction	Adverse	Local	ST	Direct	Temporary	Reversible	Minor to Moderate	Erection and maintenance of barricades and fencing to legal standards. ESMP plus	Minor

Potential Impact	Construction/ Operation/ Decommissioning	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
									Emergency Preparedness and Response Plan plus Occupational H&S Plan.	
Potential leaks re. Water quality, Air and/or Noise pollution from Project/WWTP	Operation	Adverse	Local	ST	Direct	Temporary	Reversible	Minor to Moderate (Adverse	Advanced monitoring systems for water quality, air, noise including SCADA system.	Neutral to Minor
Damage to existing structures										
Threat to structures and buildings in the project area	Construction	Adverse	Local	ST	Direct	Permanent	Reversible (depending on survey results)	Moderate	*Adherence to Sanitary Protection Zones, "[Building] Crack Surveys*" and Third Party Insurance cover by Contractor.	Minor
Income and Employment										
Employment of local labor	Construction / Operation	Beneficial	Local	ST /LT	Direct	Temporary	Reversible	Minor	Transparent recruitment policy plans, ESMP, etc.	Minor – (beneficial)
Loss of employment for local workers and households / Breach of human rights	Construction using underage labor or persons that are victims of human trafficking. At construction completion – there may be reduced labor demand, leading to local and non-local construction labor moving out of the District to other promising work opportunities – Situation opens up to potential Human Trafficking recruitment.	Adverse	Local	ST	Direct	Temporary	Reversible	Major	Transparent recruitment policy and plans, Training of worker in managing OHS and Human Trafficking risks, ESMP etc.	Neutral

Potential Impact	Construction/ Operation/ Decommissioning	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
Loss of employment in the local farming sector	Construction	Adverse	Local	ST	Direct	Temporary	Reversible	Moderate (adverse)	Planned Phased construction in consultation with local farming sector.	Moderate (beneficial)
Gender Equality										
Gender Bias and gender-based violence (GBV)	Construction	Beneficial	Local	ST	Direct	Temporary	Reversible	Moderate to Major	*Target: 15% Female Employment throughout the Project.* GBV measures follow the policy definitions of AIIB & the World Bank. A well-resourced Gender Action Plan (GAP) will be designed & implemented. ESMP to contain a specific set of GBV-related mitigations and monitoring of Contractor staff on "core labor issues" that relates to Gender. No Child Labor[34] to be employed on the project (i.e. less than 16 yrs).	Moderate to Major – (Beneficial) + SDG5
Gender – greater equality & economic integration of women	Construction	Beneficial	Local/Regional	LT	Direct & Indirect	Permanent	Reversible	Moderate to Major	Target: 15% Female Employment throughout the Project. Management bodies of JSC "Bukhoro Suv Ta'minoti" should adopt a gender-positive policy.	Moderate to Major – (Beneficial) + SDG5
Occupational Health & Safety										
Risk to labor due to water logging during excavation	Construction	Adverse	Site	ST	Direct	Temporary	Reversible	Minor to Moderate	Excavation to take place during drier seasons, H&S training & instruction, etc.	Minor

Potential Impact	Construction/ Operation/ Decommissioning	Beneficial / Adverse/ Neutral	Extent (Site/ Local/ Regional/ National)	Short term/ Long term	Direct / Indirect	Permanent / Temporary	Reversible / Irreversible	Significance of Impact (according to defined criteria)	Proposed mitigation	Residual Impacts (according to defined criteria)
Labor and Working conditions	Construction	Neutral-Adverse	Local	ST	Direct	Temporary	Reversible	Moderate to Major	Compliance with National Labor Code, GIIP. Preparation of ESMP including a Labor Management Plan and training on community awareness and accountability.	Minor to moderate (Beneficial)
Labour Influx and Mangement										
Influx of labor and workers in camps	Construction	Adverse	Local	ST	Direct	Temporary	Reversible	Moderate to Major	Labour and Community H&S Plan covering worker and community health and safety shall also be prepared separately to the ESMP requirement.	Minor to Moderate
Influx of workers operating the WWTP	Operation	Adverse	Local	MT	Direct	Permanent	Reversible	Moderate	Health and Safety Plan, which is a part of the Community and Worker Health and Safety Plan.	Minor to Moderate
HIV/AIDS and Human Trafficking										
Increased Incidences of HIV/AIDS/Human Trafficking	Construction	Adverse	Local	ST	Indirect	Temporary	Irreversible	Moderate	ESMP and regular training of workers.	Minor

11 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

11.1 Introduction

This section presents the ESMP that has been prepared for the Project. Regardless of how the contract packages are eventually set, the ESMP has been developed using an approach, based on an assumed engineering requirement in construction and operation requirements. The ESMP presented in Table 11.1 is designed to present the following information for action in the facility(s) pre-construction, construction and operation:

- Identify key impact areas;
- Propose mitigation measures minimising the magnitude of impact generation due to project implementation;
- Recommend measures which will reduce each environmental and social impact considered to be significant enough to require a degree of control;
- Comply with all the environmental laws and regulations of the GUz and AIIB safeguards policy requirements, inclusive of international standards;
- Develop a monitoring plan which will;
- Establish baseline conditions for comparison purposes;
- Monitor the performance of the Project and effectiveness of mitigation measures;
- Determine compliance with regulatory framework;
- Provide for remedial actions in cases where monitoring identifies a shortfall in targets for which corrective action is possible;
- Achieve sustainable and environmentally and socially acceptable development interventions for the Project;
- Inform GUz, PCU, and AIIB, about the implementation of the detailed design and supervision consultants and the construction contractors on environmental, social and health and safety management strategies.

To achieve the above objectives, the following have been considered during the formulation of the ESMP:

- Outlining measures to be adopted in project planning and design to avoid or minimise adverse impacts on the environment and affected communities.
- Formulating specific mitigation measures to avoid or minimise the adverse impacts of pre-construction, construction, and post-construction phases of the Project.
- Preparing a plan to monitor the implementation of the mitigation measures and their effectiveness in combating the adverse impacts.
- Establishing an institutional mechanism for ESMP implementation, monitoring, and reporting.

11.2 Additional Social Impact Concerns

As part of the Social Assessment included consultations, covering all 5 project communities. Section 9.4 above includes further information on the consultations carried out. Some of the issues that were raised by the surveys and consultations are addressed as part of the “Operation Stage” of the Project Sewage pipe network ESMP. The rationale addressing these issues in the Pipeline network ESMP, is because the community members are a stakeholder beneficiary and end-users of the Project sanitation systems; and they are mostly benefitting from the sewage pipeline network end of the Project and, therefore, community issues must be addressed commencing from the community, as beneficiaries’, end of the project. The following concerns have been raised and are applicable to all 5 project communities:

- There is a limit to Willingness to Pay (WTP) and Ability to Pay (ATP)
- Warning to users about disconnection
- Connection to centralized sewage system do not have access to the central sewerage system. If 8.3% of respondents referred to the high cost of such a service, then 73.1% of respondents said that there is no central sewerage system as such in the cities where the respondents live. 13.6% believe that this is an unnecessary pleasure, that is, there is no need to connect to the central sewerage. 2.2% of respondents complain that they asked to connect their households to this system, but a negative response was received from Suvta’minot JSC.
- Over the past six months, including adults and children (under 18 years old), there have been cases of abdominal pain, and diarrhoea. If in adult men such cases amounted to 4.7%, then this indicator was 5.6% for women and such diseases occurred in 4.8% of cases with children under 18. This is the resultant impact caused by a lack of hygiene and sanitary standards
- Average water supply service = limited ability to use sewage system

Note, for information purposes, Annex 15 provides indicative cost estimates for certain items listed in the below Environmental and Social Management Plan. It should be noted that these indicative prices are not an exhaustive list of the costs of the management and mitigation measures required in this ESIA. They are merely intended to provide local context for the approximate cost ranges of a few specific items, as of the date of this report. This in no way reduces the Contractor’s total responsibility to develop their price and methodology, such that it complies with all requirements of this ESIA. The Contractor is required to include for all costs associated with complying with the requirements of the ESIA in Annex 15.

Table 11.1 Ramitan Environmental and Social Management Plan

Environmental / Social Concern	Impact/Issue	Mitigation Measures	Institutional Arrangements			Timing
			Implementing	Responsible	Supervision	
PRE-CONSTRUCTION PHASE						
Design Measures	Detailed design not incorporating measures and equipment which optimises reducing environmental and social impacts, using engineering solutions and other features. Design not complying with requirements of the EIS and Positive Conclusion of the State Ecological Expertise for the Lot.	• Proper detailed design allows for reducing environmental and social impacts, using engineering and other features. • Design to minimise traffic disruption and safety of residents when bringing in materials and machines to site. Take all practical measures to ensure road safety and accessibility during construction and operation, within constraints of project cost. • Design for maximum recycling and re-use of materials both during construction and operation; minimising waste and waste disposal. • Design to minimise resettlement and maximise livelihoods improvements. Use of local materials and labor as much as possible in design, construction, and operation phases. • Design to avoid all trees in compliance with Uzbekistan laws on the Moratorium of tree cutting. • Design to ensure that pipeline and reinstated material, including surface level (Asphalt, concrete, vegetation), is resilient to extremes of Uzbekistan's climate and environmental conditions, especially reduced need for maintenance; as well as being resilient, and/or minimise contribution, to technological, natural and anthropogenic hazards and disasters. • Contractor is responsible for temporary works design and must take the above measures into account.	Fidic Yellow: Contractor, Supervision consultant, PCU. Fidic Red: Design Consultant (permanent works), Contractor (temporary works), Supervision Consultant, PCU	Fidic Yellow: Contractor, Supervision consultant, PCU. Fidic Red: Design Consultant (permanent works), Contractor (temporary works), Supervision Consultant, PCU	Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU), UzSuvta'minot	During detailed design
Bidding and Contract Documents	Ensuring full E&S documentation is included for bidder to price and selected contractor to implement through contract obligation.	• Provide, as part of the bidding documentation, the ESIA with ESMP, GAP, RPF, Social Due Diligence and other Plans prepared for Ramitan. • Ensure all relevant provisions of the ESMP in terms of implementation of environmental mitigation measures, monitoring activities, supervision and reporting are included in the contract documents and construction supervision. • Incorporate particular requirements into the Specification, e.g. protection of flora and fauna, control of stockpiles, etc. • Make explicit that compliance with all environmental provisions is to be incorporated into the Bill of Quantities unit rates for work items.	Design Consultant to prepare deliverables. PCU / Supervision Consultant to compile and issue bidding pack.	PCU / Bukhoro Suv Ta'minoti	PCU / Supervision Consultant/ Bukhoro Suv Ta'minoti	During design
Necessary permits and approvals	Permits for various activities at the construction camp and workshop structures and activities. Permits as per regulations of Uzbekistan:	• Sanitation requirements • Rental agreements • Require EIA and EIS approvals and engineer/employer approval. • Obtain, before construction, all environmental documents including EIS. • Permits for (but not limited to): • Material etc. (needs to be detailed) • Opening a new borrow pit • Using existing borrow pit etc. • Waste disposal. • Use of certain hazardous materials and waste disposal • Water and sanitation requirements	Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU), UzSuvta'minot / Contractor	PCU / Supervision Engineer	Bukhoro Suv Ta'minoti JSC and District Environment Committee	Pre-construction and during construction (if necessary)
Grievance Redress and Complaints	Handling Complaints that come from residents and other stakeholders	• Design a grievance redress procedure whereby the concerns of local residents and stakeholders over potential impacts of the project can be addressed and resolved to the satisfaction of the parties and public informed of construction progress. • Complaint logs exist and are being updated. • Complaints received shall be reviewed and passed to the employer and engineer within the GRM timeframe. • All Complaints received from the Grievance mechanism shall be resolved within the GRM timeframe through written instruction from the Engineer/PCU. • Design GRM for workers to manage working conditions The Workers shall be briefed, during induction at beginning of employment, on the GRM process that is set up for workers, and this subject will also be a part of the "refresher courses" provided to workers.	Design Consultant / PCU / Supervision Consultant	PCU / Supervision Engineer	Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU), UzSuvta'minot	During detailed design and Construction
Land Acquisition and Resettlement	Resettlement, Land Acquisition and Livelihoods impacts identified during project implementation	• Resettlement Policy Framework has already been prepared • Contractor, with Supervision Consultant, PCU Employer and Hokimiyat representative shall check pipeline network sites, SPSs and WWTP sites and each of the contractor chosen/rented facilities areas for any impacts Resettlement, Land Acquisition and/or Livelihoods impacts, identified during project design construction and operation. • Construction contractor will mark out the sites' land footprint, determine impacted areas (including easements) and cross-check, with land user that the signed letter for voluntary donation remains valid or compensation paid (if required); and any land areas not fitting with the agreements / compensation	Design Team / PCU / Supervision Consultant/	PCU / Supervision Consultant/ Bukhoro Suv Ta'minoti	PCU / Bukhoro Suv Ta'minoti	During design and throughout the Construction stage

Environmental / Social Concern	Impact/Issue	Mitigation Measures	Institutional Arrangements			Timing
			Implementing	Responsible	Supervision	
		shall be acted upon, using RPF as a guide in preparing and signing of voluntary agreements or valuation of, or compensation for impacts are completed and up-to-date. • During Pre-Construction phase a Site Survey Study will be conducted to consider sensitive receptors present on Right of Way (RoW) and near vicinity, then a list and a map of the overall sensitive receptors of the projects across all aspects (air pollution, noise, water quality, biodiversity at minimum) along with respective distance to project location, will be prepared."				
Contractor compliance with Environmental and Social Requirements on-site	Contractor Planning - Environmental and Social Management Plan (CESMP)	• Each Construction Contractor, within the first month after contract award, shall prepare, and submit to the Employer and Construction Supervision Consultant, a Contractor Environmental and Social Management Plan, • CESMP shall be approved by the Employer/PCU; accepted by the Construction Supervision Consultant; and submitted by the Employer to the AIIB for concurrence. • An Accident, Incident and "near-miss" log or record shall be kept updated and made available to the Employer and Supervising Consultant at any time. Records shall be summarised in the Quarterly monitoring reports. In case of near-miss or incidents/accidents, the contractor shall inform the supervising Consultant and Employer within 3 hours of the incident, preliminary report within 12 hours, and final reporting after investigations are completed (including any that require external investigations – eg. Police or fire etc.). • No civil or construction works will be conducted before the CESMP is approved by the Employer/PCU and accepted by the Construction Supervision Consultant.	Contractor	PCU / Supervision Consultant/ Bukhoro Suv Ta'minoti	PCU / Bukhoro Suv Ta'minoti	Month 1 of Construction contract award and any updates during project period
Cultural Heritage	Cultural or archaeological objects within the construction alignments/site found by chance. Chance-find and/or damage to unknown objects and resources of cultural and archaeological value, if found, are a potential, but small risk.	• During site preparation and the construction phase an initial walk-over will be conducted to see if any features of cultural heritage/archaeological interest are identified, record should be made, in accordance with the *Annex 11* template, including coordinates of location of findings. If any cultural assets are identified with the site boundary the procedure will be in accordance with the laws of Uzbekistan under the Chance Finding Procedure.	Design Consultant / Contractor	Contractor	Supervision Consultant / Project Coordination Unit (PCU) / UzSuvta'minot	During pre-construction phase
Flora and Fauna	Damage, destruction, pollution, trees and shrubs and animal habitats	• A one-time study will be carried out before the construction starts at preconstruction phase and coordinate data of any identified areas of conservation interest will be noted in a registry as identified in *Annex 12.* If identified all critical habitat areas will be labelled. Before entering critical habitat areas, all critical flora seeds will be collected and sent to the gene bank. In critical fauna areas, live control will be carried out and the species will be moved to the area compatible with the habitat.	Contractor	Contractor	Supervision Consultant / Project Coordination Unit (PCU) / UzSuvta'minot / Ecological Department	During pre-construction phase
DETAILED DESIGN AND OPERATION: CONSIDERING COMMUNITY VIEWS						
Utility Service Connection	Willingness and ability to Pay: Some household connections will be paid by project, but some may not	• Formalise program on how project financing household connections shall be determined. • Consultations continue regarding the cost of household connections. • Consultations continue regarding tariffs for continued services.	Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU)	Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU)	Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU), UzSuvta'minot	Consultation during construction and Implement at Operation
Continued Utility Service Connection	Willingness to Pay and affordability of Tariff for sewage network service over time	• There is an understanding that there will be a service Tariff on the use of the sewerage network. • Consultations continue regarding affordability of tariffs for continued services. • Formalised warning system with adequate timing and notice for services cut	Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU)	Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU)	Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU), UzSuvta'minot	Consultation during construction and Implement at Operation
Health and Hygiene	Current systems causing diarrheal diseases	• Mass awareness campaign to advise potential users health and hygiene around use of the sewerage network connection. • Monitoring during operation stage regarding changes in health of community.	Supervision Consultant Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU)	Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU)	Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU), UzSuvta'minot	Consultation during construction and Implement at Operation
Water Availability	Concerns on connection of water and use of system,	• Mass awareness campaign to advise potential users on water connection / supply needs for sewerage connection. • Awareness on water saving methods in household.	Supervision Consultant Bukhoro Suv Ta'minoti JSC / Project	Bukhoro Suv Ta'minoti JSC / Project	Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU), UzSuvta'minot	Consultation during construction and

Environmental / Social Concern	Impact/Issue	Mitigation Measures	Institutional Arrangements			Timing
			Implementing	Responsible	Supervision	
			Coordination Unit (PCU)	Coordination Unit (PCU)		Implement at Operation
Use of sewage system	Misunderstood use of Sewage system and manholes – misuse and, therefore, blockage and disruption of services	• Mass awareness campaign to advise potential users on what should go into the sewage network and what should not. • Part of awareness includes user members of the community are prohibited from using and disposal of items that will affect normal operations of sewer network and SPSs and WWTP. • Utility connection and consumer tariff to be a part of the awareness program and discussion	Supervision Consultant Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU)	Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU)	Bukhoro Suv Ta'minoti JSC / Project Coordination Unit (PCU), UzSuvta'minot	Consultation during construction and Implement at Operation
CONSTRUCTION PHASE						
Livelihood Impacts	Loss of structures	• In case any other land acquisition or loss of structure, plants, business or other income will be identified during the project implementation, PMC and PCU will prepare Livelihood Restoration Plan.	Mahalla Committee	Mahalla Committee	PMC and PCU	Before start of construction activities
Environmental Awareness	Workers and Management of the Subcontractors have (in-) adequate environmental awareness / experience which is reflected in levels of compliance in detailed design and construction.	• Contract documents to contain full information on scope of environmental safeguards, needs for adequate, qualified HSE staffing for number of workers expected, and other parts of Contract documents include specifics that require costing, as necessary. • All workers to provide an induction session prior to commencing on site. • Conducting special briefings and/or on-site training for the Subcontractors and workers on the environmental requirements of the Project. • Conducting briefing sessions as and when required.	Contractor	Contractor	Supervision Consultant / Project Coordination Unit (PCU) / UzSuvta'minot	Before start of Construction or for workers commencing employment on a site
Soil and soil pollution	Slope erosion. Siltation into canals, drainage and other waterways during pipeline construction period.	• Fill should be compacted properly in accordance with the Engineer Specification. • Unsuitable and surplus excavated materials shall not be disposed to locations, or in a way, that it will subsequently be prone to erosion. • Protect slopes from erosion, where bare slopes are exposed as a consequence of the works limit the period of exposure to water or wind erosion and provide temporary or the designed slope protection at the earliest opportunity, measures shall include temporary or permanent drainage including check dams and may also include covering with sheeting, bioengineering (seeding and planting) geotextiles, gabion boxes, riprap and/or other physical measures that will hold unstable soil. • Minimise or protect areas of bare soil throughout the year, given that rainfall is decreasing but there is always wind, which is increasing magnitude and frequency year-by-year. • Precautions as necessary to prevent erosion of areas under construction if heavy precipitation occurs including excavation/fill/etc any areas that cannot be completed prior to the rains. • Precautions as necessary to prevent silt and dust escaping from areas under construction, particularly the pipeline networks, into rivers and canals over which, or adjacent to water areas. • Planting with indigenous species. • Exposed areas shall be protected using conventional civil engineering structures in conjunction with bioengineering techniques similar, but not limited, to those recommended above and below for slope protection. • Bio-engineering erosion protection shall, as far as possible, employ indigenous varieties of plant and may be used in combination with mulching and/or soil reinforcement such as bio-degradable matting or another suitable geotextile. The contractor shall be responsible for the care and maintenance of all bioengineering planting until the vegetation is established and self-sustaining. • In the short-term, either temporary or permanent drainage works shall protect all areas susceptible to erosion. Measures shall be taken to prevent ponding of surface water and erosion of slopes. Newly eroded channels shall be backfilled and restored to natural contours. Check dams and/or drop structures with designed stilling basins will be provided (if needed) • Restoring and reinstatement all areas used temporarily for the works immediately these areas are no longer required including borrow areas and temporary lay down areas. • In the event of accidents, collector, all efforts will be made to close off the watercourse to adjacent drainage and canals. • Ensure that booms are installed to prevent larger soil particles from floating into other water courses and collector canals. • Silt fencing is applied along the access road and along the drainage lines to avoid silt erosion • Stockpiled materials, topsoil and other earth fill and material, when not being accessed, shall be kept covered or with approved erosion controls, at all times, to protect against wind or water erosion. • Do not stockpile any materials over a water course or in depressions or valleys that are water paths. • Avoid stock piling of materials on the banks of watercourses or in any area prone to flooding.	Contractor	Contractor	Employer, Engineer and Regional Environment Committee	During construction, on a daily basis

Environmental / Social Concern	Impact/Issue	Mitigation Measures	Institutional Arrangements			Timing
			Implementing	Responsible	Supervision	
		• Ensure that silt fencing is applied along the access road and along the drainage lines to avoid silt erosion • At no time shall the workers excavate spoil or rocks into any waterway or drain. These shall be collected and disposed of, as fill, or recycled in reinstatement of pipeline trench. • Trucks shall be covered with a tarpaulin and tailgates closed, preventing loads from spillage into waterways and drains during transport.				
Air Pollution	Temporary emission of air pollutants (Hydrocarbons, Microbial pollutants, CO, CO_2, SO_2, NOx, N_2O, CH_4 etc) from heavy machines and vehicles and flying dust may occur. Refer to section and to monitoring plan below.	• The concentration and dispersion of harmful substances in the air should be constantly monitored so that they do not go beyond the limits specified in the conclusion of the EIS and in accordance with World Bank/IFC/EHS requirement and does not exceed the norms established by the legislation of Uzbekistan – the most stringent shall be used. • Periodic checks and maintenance of vehicles • All heavy machinery will be fitted with air pollution control devices that are operating correctly and operate with Uzbekistan statutory requirements for the areas of operation. • Old machines / vehicles shall not be used so as to reduce air pollution emissions. • Periodic maintenance of construction vehicles will be carried out and recorded, and the unnecessary idling of work equipment will be prevented in order to avoid harmful or excessive emissions. • Engines will be shut down during waiting times • Monitoring ambient air quality at construction site and residential areas comparing to IFC/WB and Uzbekistan EHS Guidelines (refer to Section 5 above). • Vehicles transporting easily blown materials such as sand and soil will be covered by tarpaulin and tailgates closed. • Backfill, bedding and pavement materials will be stored in designated storage areas, and the materials will be moistened and compacted to prevent wind dispersion. • Stockpiled materials such as sand/soil (dust forming materials) will be lightly wetted before loading, particularly in windy conditions. • Periodic watering (or other dust suppression methods) of the construction site and surrounding construction area in case of strong winds, dry and summer periods. • Precautions as necessary to prevent silt and dust escaping from areas under construction, particularly the pipeline networks, into rivers and canals over which, or adjacent to water areas. • Periodic carwash particularly tires and lower body of vehicles when moving off construction site; spills along roads caused by vehicles from site will be cleaned up immediately; and mixing equipment (e.g. concrete mixer etc) will be well scaled (cleaned) in one area, which shall later be cleaned prior to exiting the site – scaling shall not occur near drainage or waterways and will only occur on areas of the construction site. • Watering frequency and program will be determined by taking into account the Pre-Construction Assessment studies. It will be planned taking into account the issues identified in the report (settlement, school, hospital, agricultural area, critical habitat area, etc.). • Construction site is to be kept clean/tidy, including optimal storage of materials/waste on the site and workshops. • Community consultation to warn of inconveniences and mitigation techniques for community to also use in their homes/businesses. • PPE for all workers shall be supplied if risk of exposure to air polluting and dust generation related activities. • Refuelling should be done at specially licensed stations. • It is important to prevent car traffic during construction. This prevents the release of excess pollutants into the atmosphere. • Do not use a gas stove in the kitchen at an unplanned time and constantly monitor the smooth operation of the gas stove and ensure the air-gas mixture does not change. • Cement and other such fine-grained materials delivered in bulk should be stored in closed silos fitted with a high-level alarm indicator; weigh hoppers shall be vented to a suitable filter. • Mixing equipment, such as concrete trucks, should be well scaled (cleaned). • Employing fuel-efficient and well-maintained haulage trucks with proper exhaust baffles to minimise exhaust emissions. • Turning off the engines for all vehicles, while parked on the site. • Providing barriers when strong winds are likely to blow away dust and debris. • PPE for construction workers – facemasks, ear and eye protection etc.	Contractor	Contractor	Supervision Consultant / Project Coordination Unit (PCU) / UzSuvta'minot	During construction

Environmental / Social Concern	Impact/Issue	Mitigation Measures	Institutional Arrangements			Timing
			Implementing	Responsible	Supervision	
		• Contractor to ensure that pipeline network is constructed in accordance with the appropriate design and to the highest standards. The network construction should be free from construction defects prior to commissioning. • Fuel consumption data used in the field will be recorded on a monthly basis. See Annex 5 for an example of the fuel consumption registry. • Air quality monitoring will be carried out at pre-construction stage at the locations provided in Annex 9. These locations will be agreed upon by the environmental authority before sampling has taken place. This sampling will be carried out by the contactor. • Regular maintenance of generators will be ensured. • The generators used in the field and the amount of fuel used will be recorded on a monthly basis. • A drip tray will be placed under each generator used in the field. All drip trays used will have the capacity to contain 110% of the amount of oil and fuel contained in each respective generator.				
Waste Includes unused construction spoil from excavation activities, household waste, industrial waste of other construction materials (e.g. Pipe off-cuts) and hazardous materials wastes during construction (e.g. glues, asphalt chemicals, fuels etc).	There will be, on-site and in campsites / workshops / offices (where existing), generation of: • Household and office general waste • Construction waste Hazardous waste products (bitumen emulsion / fuels/oils etc. containers	• Design for maximum recycling and re-use of materials both during construction and operation; minimising waste and waste disposal. • A waste management plan shall be prepared and attached to the CESMP and regularly updated. Environmental Monitoring reports shall provide updates of magnitude of waste generated under the project (disaggregated as contractor separated waste, disposal method used • Follow waste management limits provided in the EIS by the State Ecological Expertise in the Positive Conclusion to the EIA • Education of workers to encourage reduction, recycle and reuse of waste. • Prohibition of illegal dumping. • Separation of waste by type and store in appropriate manner and location. • Storage of waste containers in an appropriate location, with spill containment applicable to 110% of capacity and prevention of permeation into the ground. • Dispose of hazardous and non-hazardous waste at an appropriate legal site, with appropriate permits and, at minimum, in accordance with Uzbekistan standards and laws. • Document the reuse, recycling and safe disposal of spoil non-hazardous and hazardous waste, including disposal sites and volumes. • Identify in coordination with environmental authorities and Hokimiyats, as required, potential safe disposal locations. • Investigate environmental conditions of disposal sites and prepare a recommendation for most suitable and safest site(s). Environmental authorities may require EIS and permits to be made available • Designated disposal sites to be used in the Project, to be approved also by engineers and the Employer. • Provide guidelines for proper and safe spoil and construction waste disposal • All waste disposal handlers shall be provided appropriate PPE. • Any hazardous materials which are included under any International Convention, will be handled and disposed of to international standards, if avoidance is not possible. However, these materials will only be from “demolishing” existing facility and shall not be brought on-site as new construction material. • Fuel pumps, batching plants/materials processing plants and workshops are areas of high-risk hazardous oil leakage and spills. In these areas, absorbent materials, first aid equipment, cut-off ditches and other spill containment methods shall be implemented. In areas where hazardous materials are to be kept, the best HSE techniques will be provided by the manufacturers in the issued MSGS. In cases of fuels and oil, all storage and waste areas shall include bunding to a minimum of 110 % capacity and more, if the manufacturer requests and/or if explosive risks are a potential hazard. • It will be ensured that the amount of waste and disposal facilities will be recorded, taking into account the type of waste, see an example of a waste registry in *Annex 13.*	Contractor	Contractor	Hokimiyat, / District Environmental Department / Supervision Consultant / Project Coordination Unit (PCU) / UzSuvta’minot	During construction, on a daily basis
Earth, air, water, soil cover	Dust, levels of air pollution, soil pollution, noise pollution impact water sources	• Obtaining permits (refer to Section 5 above): • Act on the right to use land, the subsoil use contract / Environmental Passport Enterprise Resolution GOST technical supervision sanitary inspection ensures the development of the EIA, and MPE project emission permit Art. Article 11 of the Law of the Republic of Uzbekistan “On Environmental Examination” of May 25, 2000. Resolution on the use of water reclamation project. • Environmental monitoring of toxic gas emissions, dust levels, noise and vibration, as well as soil contamination conducted in accordance with the environmental monitoring plan. • Water for drinking is stored in airtight containers in a strictly designated area no closer than 75 m from the working area and shall be accompanied by an officially licensed quality certificate. • Contractor is responsible for sanitary living conditions in the workplace generally to the level of Uzbekistan legal standards, FIDIC general contract conditions (without editing).	Contractor	Contractor	Supervision Consultant / Project Coordination Unit (PCU) / UzSuvta’minot	During construction, on a daily basis

Environmental / Social Concern	Impact/Issue	Mitigation Measures	Institutional Arrangements			Timing
			Implementing	Responsible	Supervision	
		• Temporary land acquisition may be required for construction camps, stockpiles and workshops. In such cases, if agricultural soil is present in the areas, approximately 30 cm of soil will be stripped and stored in piles. • Precautions as necessary to prevent silt and dust escaping from areas under construction, particularly the pipeline networks, into rivers and canals over which, or adjacent to water areas.				
Noise and vibration	Temporary noise from the construction machines and vehicles at site	• Periodic check and maintenance of vehicles. • The operation of heavy equipment shall be conducted only in daylight hours; damages to building or other property as a result of such activities are to be rectified by the works contractor at the contractor's cost. • Blasting shall not be used for excavation of rock (if any), instead chemical expansion methods or rock breaker will be used to shatter rock which can then be excavated by machine. Care must be taken in using these machines around house and other structures. • Use low noise/vibration type of equipment (E.g. Oscillating rollers and similar equipment with reduced noise/vibration). • Monitoring of noise levels at site boundary and residential areas comparing to Uzbekistan EHS Guidelines and Contract requirements. • At notice to proceed, the contractor to conduct a "Crack Survey" prior to construction commencement for the purpose of baseline in the case of public complaint about damage to structure(s). • Throughout the construction period, the contractor with Engineer consultant and PCU shall arrange community consultation to warn of inconveniences in the relevant areas where construction shall take place – this shall be done in at least 72 hours in advance of construction commencing in the specific area of the community. • Awareness of residents for any foreseen utility service disruptions shall be conducted no later than 72 hours before disruption. • PPE for all workers and visitors to be exposed to noise/vibration related activities to be supplied by contractor.	Contractor	Contractor	Supervision Consultant / Project Coordination Unit (PCU)	During construction, on a daily basis
Utilities (water supply, gas and/or electricity)	Unforeseen utility disruption.	• Unforeseen utility disruptions – contractor was informed and/or contractor has made no effort to identify any utility and other services within the construction site(s) - shall require assessment in time to make repairs; immediate message to community regarding repair time; and if repair time is 6 hours or longer or per Uzbekistan regulations (whichever is more stringent) the contractor shall make alternative arrangements for service supplies to affected households. • In cases where contractor has not been informed of utility and/or other services within the construction sites, and accidental disruption is beyond the control of contractor, the employer shall assist contractor and make alternative arrangements for service supplies to affected households • The Contractor will make arrangements with the utility service providers to relocate utility services before excavation and pipe laying to avoid damages. Where accidental damages occur, the Contractor will advise the concerned authority. Drinking water and usage water records will be recorded on during construction phase. A registration table has been created for drinking water record and is attached in the Annex 7, as an example.	Contractor	Contractor / Employer / PCU / Supervision Consultant	Supervision Consultant Contractor/ PCU and Ecology Department	Preconstruction and during construction
Trees and Vegetation	Need for cutting / removal of trees and vegetation and/or trees inhibiting the workspace	• Removing of trees is prohibited by Uzbekistan law. Contractor will be liable for any removal of trees from the time of contract award and site handover until Project completion • There is no foreseen need to remove trees along the project alignments. • Will need to obtain the consent of the Ecology Department if any action is required on trees. • A decision will be made together with consulting engineers on individual withdrawal, transplanting or budding of branches at the construction site. • Trees interfering with workspace may only be trimmed appropriately, with District Ecology Department permissions and supervision, to allow them to grow back subsequently. • Removal of vegetation shall be minimised to only necessary cases. • Topsoil shall be stripped and stockpiled. It shall be reused in reinstatement of the construction area after construction. • Vegetation shall be reinstated, using fast growing, deep-rooting species (native if possible).	Contractor	Contractor	Supervision Consultant Contractor/ PCU and Ecology Department	Preconstruction and during construction
Hazardous Material	Numerous construction activities have potential to release waste and hazardous material, including fuels and oil, bitumen emulsion, cement, and other materials. Significant short- or long-term impact from release of any	• Fuelling and parking machines shall be conducted a minimum of 50m away and on spill containment equipped surfaces. • Hazardous materials will be kept in appropriate covered storage areas which fits the environmental requirements of the material (review of MSDS will be required). • Hazardous materials areas will be required to have a full emergency equipment. • Storing hydrocarbons and hazardous materials on impervious ground under cover and constructing the storage area as a spill tray to avoid spread of accidental spills.	Contractor	Contractor	Supervision Consultant / Project Coordination Unit (PCU)	During construction, on a daily basis

Environmental / Social Concern	Impact/Issue	Mitigation Measures	Institutional Arrangements			Timing
			Implementing	Responsible	Supervision	
	hazardous materials into the environment.	• Providing safe ventilation for storage of volatile chemicals. • An emergency management plan covering hazardous wastes, leaks of hazardous materials and gas line leakages for the construction site and nearby communities will be prepared prior to construction. • The materials stores, if required, will have spill containment to 110% of the holding capacity, separated for each hazardous material to avoid any cross contaminations. • Permits for handling such materials and Uzbekistan certified handlers will be required. All hazardous materials are to be handled within the laws of Uzbekistan, as a minimum. • All handlers will be provided PPE. • All those assigned to handle hazardous materials and/or handle hazardous wastes will need to be trained in types, use, storage, PPE and other HSE requirements. • Estimate the amounts and types of hazardous construction waste to be generated by the project. • Document reuse and safe disposal of spoil and hazardous construction waste; including disposal sites and volumes. • Designate disposal sites to be used in the project, to be approved by Hokimiyat, supervision consultant and employer. Do not dispose sewage sludge or other hazardous wastes directly to tip or landfill. • PCBs, asbestos, lead paint residues and any other hazardous materials to be handled, to appropriate international standards or Uzbekistan regulations (e.g. Stockholm Protocol for asbestos etc - whichever is the most stringent). • Restricting and controlling access to areas containing hazardous substances. • Site all materials processing plants (e.g. batching plants, workshops, depots) and temporary workers accommodation facilities in approved locations. • Using refrigerants and fire extinguishing agents in accordance with the 'Montreal Protocol' – this is to be considered also in detailed final design.				
Water quality and flow	For rural needs, irrigation drainage is found along part of the pipeline network. Sanitation and wastewater during construction from contractors contaminating local water courses Leakage of hazardous substances from construction materials and vehicles Hazardous materials leakage from cleaning Water quality for livestock purpose.	• Monitoring river and canal water quality compared to Uzbekistan accepted standards and contract requirements. • Monitoring study of aquatic microorganisms and microorganisms necessary for the protection of fish species compared to Uzbekistan accepted standards and contract requirements. Performing regular checks that there is no release of potential pollutants from any equipment or plant; intervals not more than weekly and additional to servicing and routine maintenance. • Ensuring drinking water quality requirement under the Law of Uzbekistan - Environmental pollutant standards in design report. • Providing sanitation arrangements at worksites, offices and temporary accommodation. • Arrangements shall be made for collection of wastewater and sewage by a qualified company, ensuring contamination wastewater or sewage will not be released into river/canal or other water bodies. • Storage of fuels and other hazardous materials with spill containment and/or removable absorption materials such as bunded areas of capacity at least 110% the stored volume and to Uzbek legal safety standards. These materials must be at least 50 - 100 meters from the sites with spill containment. • Covering construction materials and spoil stockpiles with suitable material to reduce material loss and sedimentation. • No disposal to surface or groundwater bodies of wash water including that from cleaning concrete batching and concrete wagons, other equipment, and solid waste such as discarded packaging and excavated materials. • Locating any temporary construction facilities at least 50m away from water bodies (generally canal and the river). • No stockpiling of any materials over water courses or in depressions/valleys water paths. • Maintaining vehicles and equipment in good operable condition and ensuring no leakages on oil, fuel or corrosion. • Preventative regular maintenance for reducing pipe leak incidents, including where sewage pipes are crossing over a water bodies - this is limited to a small number of areas in Ramitan. • Acting rapidly on repairing pipe leaks and clearing clogged pipes incidents as soon as they become known (changes identified on SCADA systems will assist to identify these). • Acting rapidly on repairing pipe leaks especially where sewage pipes cross over a water body. • Disposal of water and waste products arising from the site via a suitably designed temporary drainage systems in a manner that will not cause pollution problems or another nuisance. • Disposal of solid waste from construction activities and temporary operational sites to controlled waste disposal sites which will contain or ensure adequate bio-treatment of leachate before it can enter the water column.	Contractor	Contractor	Supervision Consultant / Project Coordination Unit (PCU) / UzSuvta'minot	During construction, on a daily basis

Environmental / Social Concern	Impact/Issue	Mitigation Measures	Institutional Arrangements			Timing
			Implementing	Responsible	Supervision	
		• Proper construction management including, training of operators and other workers to avoid pollution of water bodies by the operation of construction machinery and equipment. • Temporary wastewater collection systems will be established in camp areas and construction sites and waste will be collected in impermeable septic tanks. The collected wastewater will be extracted by vacuum trucks and transported offsite by a licenced contractor for treatment at the nearest Wastewater Treatment Plant. • Monitoring points for the sampling of groundwater will be agreed upon between the contractor and UzSuvta'minot, a template for the coordinated can be found in Annex 8.				
Flora and fauna (Both terrestrial and aquatic)	Damage, destruction, pollution, trees and shrubs and animal habitats	• Revegetation by biological remediation. To reduce the impact on the flora of the territory must be carried out on site. • Removal and stockpile of topsoil shall be required and then reused to and reinstated around the impacted around the construction area, as relevant as well as borrow-pit sites and accesses used during construction. • Do not clear vegetation or damage vegetation outside of the worksite. • Avoid stock piling of materials on vegetated areas, as much as possible. • Monitor stockpiling to ensure appropriate soil and silt erosion prevention measures are implemented. • In all areas to be rented and in areas where permanent expropriation will be carried out; critical species inspections will be carried out. Identified flora and fauna species will be recorded. All activities such as transportation/seed collection for these species will be carried out according to the methods to be determined in the Biodiversity Management Plan. • No tree cutting is permitted, in accordance with the Uzbekistan law related to the moratorium of cutting trees. • Trimming may occur, if necessary, with the written permission of the District Environmental Officers, including a plan for rehabilitation of the pruned trees. Most of identified sites are on existing sites without trees, but accessibility may involve management of Flora. • If identified, rare, endangered, threatened or endemic fauna and flora species or fauna habitats shall be preserved. The Supervision engineer and Environmental Department officers shall be called in and a plan for preservation shall be prepared, be that of modifying design of SPS/WWTP to avoid, or relocation of, the identified species. • At the end of construction, plant appropriate seedlings, indigenous to the area, to regenerate vegetation to pre-project state. • Use of soil reuse, reinstatement, or replacement, where necessary, to promote establishment of vegetation cover, biodegradable soil reinforcements can be used. • Works contractor responsible for vegetation until established. • There are vulnerable and endangered species in some areas of Ramitan District, but none found to be in the areas of Project. In the case of identification of vulnerable or endangered flora/fauna species., construction in the areas shall immediately stop, the district ecological authorities shall be called to inspect and investigate, and recommendations shall be followed by the contractor. The siting shall be recorded by location, type, and ecological markers as much as possible. • In order to prevent dust formation during the project activities to be carried out next to or near the agricultural activity areas, regular watering of the roads and line used in the project will be ensured in order to prevent the activity from being exposed to dust formation caused by the project activities, especially during the planting and planting periods and the growth periods of the plant. • In order to prevent the transport of foreign species in these areas, it will be ensured that the wheels of all vehicles will be cleaned especially before these areas. All vehicles that will work in that area will be washed carefully.	Contractor	Contractor	Supervision Consultant / Project Coordination Unit (PCU) / UzSuvta'minot / Ecological Department	During construction, on a daily basis
Borrow Pits, Quarries and Material Stockpiles	It is planned to use solely quarries, borrow pits that are already existing and licensed. However, in the case that new pits need to be opened, due lack of materials available to engineer specification, then there may be: • Impact on landscape • Impact limitation on future land uses for quarries and borrow areas after closure.	• Estimate amounts and types of materials to be used. • Assess whether spoil materials from project excavations are suitable for reinstatement to the same general areas, reuse, recycle for construction purpose or to be sent to solid waste facility (or refill an existing borrow-pit). • Identify quarry sites and investigate environmental conditions – they will not be in environmentally sensitive areas and EIS / Environmental permits from Uzbekistan Authorities are required and copies provided to Supervision Engineer • Access Environmental Assessments and permits. • For new areas to be opened, "Environmental Assessments" and permits, as per Uzbekistan laws, shall be prepared. • Investigate less environmentally invasive materials to use.	Construction Contractor	Construction Contractor	Supervision Consultant / PCU / State Environmental Authorities	Pre-construction identification and Preparation; use during construction; and post-construction rehabilitation

Environmental / Social Concern	Impact/Issue	Mitigation Measures	Institutional Arrangements			Timing
			Implementing	Responsible	Supervision	
	• Dust and air pollution	• Clearing of trees is prohibited by law, and clearing vegetation is discouraged, but all topsoil will be stripped and used to reinstate the area along with a revegetation and tree replacement program once works are completed by the contractor. • Temporary cut-off ditches and/or settling basins shall be dug to collect run-off water and to prevent erosion and surface water contamination. • Undesirable ponding of uncontaminated water shall be prevented through temporary drains discharging to natural channels. • Sites disturbed by the Project will be restored after construction activities have ceased. The site will be left in a stable condition, without steep slopes. Stripped materials will be spread to stable contours in order to promote percolation and regeneration with endemic species of natural vegetation, trees and natural drainage. • PPE (reflective vests, helmets, masks etc) shall be provided to all workers. • Traffic Management shall be fully planned prior to construction commencing on each new road – location of trench, borrow-pit, materials stockpiles areas etc.				
Households	Access for residents along the pipeline site Impacts of dust and noise to households	• Residents along the project pipeline network shall be consulted regarding impacts and accessibility from the road to their homes. • Residents shall be consulted prior to construction on the temporary locations of public services, such as bus stops, pedestrian and access to mosques, schools, markets, local shops and other institutions, causing least impact on livelihoods. • Awareness to residents about potential impacts from construction works, how the contractor will minimize impacts and, if the resident chooses, how they can further reduce impacts (of noise and dust etc.) within their own houses. • The Contractor will locate the construction camps in areas that are acceptable from an environmental, cultural, or social point of view. The location of construction camps should be to avoid social conflict in using water, electricity, gas, or other resources or to avoid the possible adverse impacts of the construction camps on the surrounding communities. • Contractor's Construction Management Plan should provide a detailed layout plan for the development of the construction camp showing the relative locations of all temporary buildings and facilities that are to be constructed together with the location of site roads, fuel storage areas (for use in power supply generators), solid waste management and dumping locations, and drainage facilities, prior to the development of the construction camps. • The Contractor will ensure security and safety in the project sites. Local authorities responsible for health and security should be duly informed on the set-up of camp facilities to maintain effective surveillance over public health, social and security matters. • The Contractor will ensure proper collection and disposal of wastewater and solid waste within the construction camps to avoid any campsite spillage, contamination, or mess. • The Contractor will ensure regular medical checkups of its workers to prevent disease spread into the surrounding villages. • The Contractor will hire the local population (especially women for appropriate works if possible) for construction work as much as possible. • The Contractor will restore damaged properties and utilities. • GRM will be implemented.	Contractor	Contractor	Supervision Consultant / Project Coordination Unit (PCU) / UzSuvta'minot	During construction, on a daily basis
Farmers and businesses Livelihoods	Commercial farms and businesses in the along the length of the pipeline may be interrupted during construction	• Access for farmers with farms along the length of the pipeline will be provided for the duration of the construction period. • During harvesting periods and various busy crop operation periods, road access will be provided, and construction shall be restricted. • All small businesses, such as shops and other businesses, shall be granted safe access to customers and will be well sign-posted. Pedestrian and vehicle access shall be provided as much as possible. • A maximum 500-meter strip for the pipeline may be excavated in the case that no 2-way direction traffic alternative accesses are available. Well sign-posted detour signs shall be introduced where construction works will fully block roads and cannot remain open.	Contractor	Contractor	Supervision Consultant / Project Coordination Unit (PCU) / UzSuvta'minot	During construction, on a daily basis
Health and Safety on construction site	Risk to health and safety of construction workers while on construction sites	• Compliance with safety regulations and laws of Uzbekistan and contract requirements. • Compliance with safety regulations and laws of Uzbekistan and contract requirements. • Each worker shall undergo environmental, health and safety Induction training, by qualified HSE Specialist of the contractor on each workers' commencement on the project, based on the approved CESMP. • The contractor will appoint fulltime qualified and experienced OHS staff at the site. • Contractor will carry out job hazard analysis for each type of construction activity resulting in the provision of specific training activities to the workers.	Contractor	Contractor	Supervision Consultant / Project Coordination Unit (PCU) / UzSuvta'minot	During construction, on a daily basis

Environmental / Social Concern	Impact/Issue	Mitigation Measures	Institutional Arrangements			Timing
			Implementing	Responsible	Supervision	
		• Contractor will deliver regular training sessions on occupational health and safety aspects. • An Emergency Management Plan shall be prepared to cope with all foreseen emergency incidents including medical, hazardous waste spill, fire and other emergencies, and will consult with emergency services, community and workers and other stakeholders within the plan. • An Accident, Incident and "near-miss" log or record shall be kept updated and made available to Employer and Supervising Consultant at any time. Records shall be summarised in the Quarterly monitoring reports. In case of near-miss or incidents/accidents, the contractor shall inform the supervising consultant and employer within 3 hours of the incident, preliminary report within 12 hours, and final reporting after investigations are completed (including any that require external investigations – eg. Police or fire etc.). • Construction vehicles will avoid, as much as possible, built-up areas, driving during peak hours and peak school commuting times. • Random monitoring checks of drivers obeying traffic safety regulations, appropriate licensing for vehicle operation, alcohol and drug testing, driving safety, speed restrictions and of vehicle equipment maintenance and working (brakes/horns/mechanics) including maintenance record books; installations of traffic signs; and driving safety education. • Traffic Management Plans, to be approved by Police, local Hokimiyat and Consultant with Employer, will be prepared for safe traffic flow on-site and for when vehicles for materials deliveries on the public roads coming to/waste going off- site. • In the event of accidents of any form, a full report will be prepared, filed and a copy provided to the Employer/Engineer. • All trenches of 1.3 meters deep or more, shall require benching (generally 1 meter or more width from trench) or walls for shoring trench walls to avoid cave-in of trench and protection of workers. • The construction site will be fenced to prevent and detect theft, vandalism and other crimes, to ensure that possible security breaches are quickly detected and to help ensure the safety of employees. • Relevant recruitment of security personnel for the security of construction sites and sites will be implemented to further ensure the safety of the workers. • All personnel entrance to the work sites will only from the designated entrance area				
Health of workers	General health impacts on workers during construction phase	• Provide appropriate personal protective equipment (PPE) for workforce, e.g. safety boots, reflective vests (summer), reflective jackets (winter), helmets, ear protection, goggles, gloves, etc. and to replace it when damaged. • Conducting regular toolbox talks, or special briefings and/or on-site training, for the contractors and workers on the environmental, health and safety requirements of the project. These are for general and work activity specific awareness. • Contractors to provide workers with social sensitivity training, which may be conducted at the same time as HIV awareness in which the problems and issues will be explained). • Training in safe construction techniques, including use of equipment. • Regular mandatory medical check-ups on an annual basis, with freely available testing facilities at any time for HIVS/AIDS – STIs and other infectious illnesses. • Establish a cooperative relationship (e.g. Contract agreement) with local hospital or other medical facilities for referring more serious cases. • Anti-discrimination policy will be prepared ensuring males and females will be treated on an equal opportunity basis. • Requirement for male/female separate facilities in accordance with contract requirements will be provided. • The presence of one person and kits on each site, camp and workshop, and if needed raining in use of, first aid materials and equipment. • Provide details of security measures to prevent access to the site by the public/non-workforce personnel. • Each toilet/latrine facility shall include a water source/running water for ablutions and hygiene standards for workers • Adopt system for garbage collection and disposal/treatment. Disposal and treatment of hazardous waste and materials from demolition has to be carried out according to the Uzbekistan laws and Regulations and World Bank EHS requirements (whichever is more stringent). • Disposal sites are to be selected respecting the minimum specified distances form water protection zones, buffer zones of natural parks, settlements, abstraction facilities for water supply, while taking into consideration prevailing geological conditions. • Machinery operators will be appropriately qualified with vehicle license and over the ages of 18. The Health and Safety specialist of the contractor will monitor this on a regular basis.The Contractor will	Contractor	Contractor	Supervision Consultant / Project Coordination Unit (PCU) / UzSuvta'minot / Ministry of Construction	During construction, on a daily basis

Environmental / Social Concern	Impact/Issue	Mitigation Measures	Institutional Arrangements			Timing
			Implementing	Responsible	Supervision	
		use risk management strategies to protect the local communities from physical, chemical, or other hazards associated with project activities. The Contractor will ensure preparedness in emergency response. • Arranging for provision of first aid facilities, rapid availability of trained paramedical personnel, and emergency transport to nearest hospital with accident and emergency facilities. • Allocating responsibilities to ensure that these arrangements are in place. • Arranging for regular safety checks of vehicles and material and allocating responsibility for checking. • Ensuring that material extraction operations are supervised and carried out by trained and experienced staff. • Establishing procedures and providing instructions about emergency evacuations and providing a list of 24 hours emergency contacts. • Worker GRM will be implemented				
Workers Welfare	Potential negative impacts to workers welfare including equal opportunities, grievances, etc.	• Provide appropriate personal protective equipment (PPE) for workforce, e.g. safety boots, reflective vests (summer), reflective jackets (winter), helmets, ear protection, goggles, gloves, etc. and to replace it when damaged. • Conducting regular toolbox talks, or special briefings and/or on-site training, for the contractors and workers on the environmental, health and safety requirements of the project. These are for general and work activity specific awareness. • Contractors to provide workers with social sensitivity training, which may be conducted at the same time as HIV awareness in which the problems and issues will be explained). • Training in safe construction techniques, including use of equipment. • Regular mandatory medical check-ups on an annual basis, with freely available testing facilities at any time for HIVS/AIDS – STIs and other infectious illnesses. • Establish a cooperative relationship (e.g. Contract agreement) with local hospital or other medical facilities for referring more serious cases. • Anti-discrimination policy will be prepared ensuring males and females will be treated on an equal opportunity basis. • Requirement for male/female separate facilities in accordance with contract requirements will be provided. • The presence of one person and kits on each site, camp and workshop, and if needed raining in use of, first aid materials and equipment. • Provide details of security measures to prevent access to the site by the public/non-workforce personnel. • Each toilet/latrine facility shall include a water source/running water for ablutions and hygiene standards for workers • Adopt system for garbage collection and disposal/treatment. Disposal and treatment of hazardous waste and materials from demolition has to be carried out according to the Uzbekistan laws and Regulations and World Bank EHS requirements (whichever is more stringent). • Disposal sites are to be selected respecting the minimum specified distances form water protection zones, buffer zones of natural parks, settlements, abstraction facilities for water supply, while taking into consideration prevailing geological conditions. • Machinery operators will be appropriately qualified with vehicle license and over the ages of 18. The Health and Safety specialist of the contractor will monitor this on a regular basis.The Contractor will use risk management strategies to protect the local communities from physical, chemical, or other hazards associated with project activities. The Contractor will ensure preparedness in emergency response. • Arranging for provision of first aid facilities, rapid availability of trained paramedical personnel, and emergency transport to nearest hospital with accident and emergency facilities. • Allocating responsibilities to ensure that these arrangements are in place. • Arranging for regular safety checks of vehicles and material and allocating responsibility for checking. • Ensuring that material extraction operations are supervised and carried out by trained and experienced staff. • Establishing procedures and providing instructions about emergency evacuations and providing a list of 24 hours emergency contacts. • Worker GRM will be implemented	Contractor	Contractor	PCU / Bukhoro Suv Ta'minoti JSC / Supervision Consultant	During construction

Environmental / Social Concern	Impact/Issue	Mitigation Measures	Institutional Arrangements			Timing
			Implementing	Responsible	Supervision	
Employment opportunities for women and prioritisation of localised employment during construction	Gender equality issues during construction (e.g. discrimination against women)	• Contractors will be encouraged to provide opportunities to engage with affected communities to promote equity in employment and assist them in reaching or exceeding the target allocation. • An equal opportunity and anti-discrimination policy shall be prepared by the contractor and approved by the employer / supervision consultant. • Priority shall be given to employment of local labor (from Ramitan district followed by Bukhara Region). • The Contractor, PCU and PIU will implement the Gender Action Plan.	Contractor	Contractor	PCU / Bukhoro Suv Ta'minoti JSC / Supervision Consultant	During construction
Cultural Heritage	Memorials, Mosques, Cemeteries (if applicable) and other cultural heritage interests.	• Work close to religious sites such as the Mosques shall only be conducted outside of prayer times and also will not be conducted on religious holidays for both cultural and safety reasons for community members. • Work shall not be conducted during ceremonies and similar events. • The Contractor along with the Supervision Consultant shall maintain stakeholder engagement with persons responsible for cultural heritage sites, especially to ensure that construction will not disturb special cultural events and/or will not disturb areas of physical cultural importance. • Construction shall not use any part of the cemetery grounds.	Design Consultant / Contractor	Contractor	Supervision Consultant / Project Coordination Unit (PCU) / UzSuvta'minot	During detailed design and during construction, on a daily basis
	Cultural or archaeological objects within the construction alignments/site found by chance. Chance-find and/or damage to unknown objects and resources of cultural and archaeological value if found, are a potential, but small risk.	• Conduct walk-down activities with the community and Hokimiyat at all accesses and SPSs/WWTP and within the Project boundary to identify any Cultural heritage sites and discuss how to protect these sites from construction activities, where needed • Contractor will develop a Chance Find Procedure (CFP) following an outline CFP provided in Annex 4. • PMC will deliver training to the Contractor and site management teams in relation to architectural and cultural sites management before starting any physical works by the Contractor • The contractor will provide regular training to its personnel on the management of architectural and cultural sites before and during civil works, including training on Chance Find Procedure • Chance Find procedure – a) Ceasing work as soon as archaeological or cultural find is encountered during earthworks or other construction activities; b) advise PCU and supervision consultant of the find; and c) Provide relevant information and cooperation to the State Geological Agency of Uzbekistan to assess and identify further course of action. • Buffer zones to be created surrounding the Tepa-5 monument	Contractor	Contractor	Supervision Consultant / Project Coordination Unit (PCU) / UzSuvta'minot / State Committee for Geology	During construction, on a daily basis
Camps and Workshop areas	Camps are not expected to be large because the contractor should use local labor where possible. However, camps and workshops operation and location causing social and environment hazards to neighbouring areas	• Need for camps will be reduced as much as possible, by utilising local labor where possible. • Identify location of work camps in consultation with the Hokimiyat, engineering team and employer. • As a rule, the camps shall not be located near settlements or near drinking water supply intakes. • Any construction of camps shall follow Uzbekistan laws, standards, permits, inspections. • No trees shall be cut in building the camp or workshop and removal of vegetation shall be minimised. • Water and sanitation facilities shall be provided sufficient for all users of the camps, workshops etc. • Sanitation facilities will be located appropriately so as not to affect surface or ground water sources nearby and human health impacts. • Contractor shall organise and maintain a waste separation, collection, and transportation system (refer to Waste Management above). • Ensuring that all liquid and solid hazardous and non-hazardous waste are separated, collected, and disposed of according to Uzbekistan laws and regulations. • At the conclusion of the project, all debris and waste will be removed, as well as all temporary structures. • All temporary structures, including office buildings, shelters, and latrines, shall be removed and shall be restored to near natural and stable conditions. • The Engineer shall report in writing that the camp has been vacated and restored to pre-project conditions before acceptance of the works. • Male and female quarters will be separated. Gender separate latrines and ablutions will be required. • The project personnel including PMC and Contractor's workers will be responsible for following the Code of Conduct. • PMC and contractor will deliver project induction training on engaging with the local community. This will include an overview of cultural and religious measures and etiquette to bear in mind. The training and capacity-building activities will also include awareness on (1) prevention of communicable diseases and sexually transmitted infections, (2) ban on sexual exploitation, abuse, and harassment, (3) respect for residents' privacy, especially for women. • Worker accommodation areas will be equipped properly by the Contractor. The provision of good quality living accommodation, services and amenities will likely reduce the need for mixing with local communities.	Contractor	Contractor	Supervision Consultant / Project Coordination Unit (PCU) / UzSuvta'minot	During construction

Environmental / Social Concern	Impact/Issue	Mitigation Measures	Institutional Arrangements			Timing
			Implementing	Responsible	Supervision	
		• Sexual exploitation, abuse, and harassment will not be tolerated. The Contractor will work with local community leaders, local women committees, and district authorities to ensure that any complaints are addressed in accordance with the law. • The Contractor will establish worker GRM.				
Construction vehicles and community safety	Safety issues on haul routes during construction	• Contractor drivers and other machine operators shall be alcohol tested on an ad-hoc basis, as minimum, before work. • Unsafe driving practices, failed alcohol tests etc shall not be tolerated and shall be subject to strict punishment – job loss. • Select suitable haul routes away from sensitive areas (such as ecologically sensitive areas, schools, built-up areas, mosques, heavily populated areas like markets). • Trucks shall travel at no higher than 70 km per hour and lower speeds as per the laws. • All construction vehicles shall be driven, and with passengers, as per manufacture design (i.e. 2+ persons shall not ride in a vehicle where only 1 person should be seated. • Trucks will cover materials and tailgates shall be closed during transport on outside road routes. • Trucks shall not be overloaded with construction materials, due to running along smaller community roadways. • A Construction Method Statement will be prepared by the contractor. A construction-related traffic management plan will be formulated and implemented and will include for transport management and pedestrian accessibility. • Installing traffic warning signs, and enforcing traffic regulations during transportation of materials, equipment, and machinery. • Conducting awareness programs on safety and proper traffic behaviour in densely populated areas near the construction sites. • Assigning traffic control personnel/flag men on the public road where trucks are entering the sites. • Arranging necessary measures for passer-by safety and all means of transportation safety (e.g., establishing protection zones, by-passing these areas during transportation of materials). • Selecting quarry and borrow sites that are served by roads of adequate capacity for heavy trucks. • Where minor roads cannot be avoided, provisions for repair and restoration shall be included by the contractor. • Repairing damages to roads caused by haulage of construction materials, spoil and equipment, and machinery. • Controlling the loading and operating speeds of haulage vehicles. • Local people and Mahal chiefs will be informed about traffic and road safety. • Obtaining approval from local authorities if local roads are used for transportation. • The contractor will take and ensure the implementation of necessary precautions (signboards, flagman, lighted barriers, and signs) at the entry and exit of all construction sites and in terms of road traffic safety along the road by cooperating with the relevant authority/administration. • Trucks, trailers, and other vehicles to transport necessary equipment and materials will be provided to comply with the speed limits. • If the community has any complaints about transportation activities, the project's grievance mechanism will be utilised, and grievances will be solved in a timely manner by implementing adequate measures/compensations • All drivers and operators will be ensured to have the appropriate class of driver's license and/or operator authorization. • The speed limit for all vehicles and construction equipment at village crossings is 20 km/h. The speed signs have been placed at the entrances and exits of the work and construction site, showing the speed limit has been positioned. Workers and all personnel will be informed about the speed limit. • As long as vehicles and construction equipment do not pose a risk in terms of safety, they will park backwards in the direction of exit to the designated construction equipment parking area. • Periodic maintenance programs for construction machinery and work equipment in line with the manufacturer's instructions are created by the occupational safety specialist will be applied and followed. • During the hours when the traffic density increases, the project vehicle traffic will be reduced in order to reduce the traffic load and avoid possible accidents. It will be ensured that roads that will not affect the existing traffic load are used to reach the quarry. • Signs will be placed at the entrances and exits of the work and construction site and the speed limit will be positioned. • The construction site is fenced off and speed limits will be placed on the main road connection.	Contractor	Contractor	PCU / Supervision Engineer Consultant	During construction

Environmental / Social Concern	Impact/Issue	Mitigation Measures	Institutional Arrangements			Timing
			Implementing	Responsible	Supervision	
Accidents and Emergencies	There is the possibility of accidents caused by construction work and operation of construction vehicles.	• Compliance with safety regulations and laws of Uzbekistan and contract requirements. • Construction vehicles will avoid, as much as possible, built-up areas, driving during peak hours and peak school commuting times. • Random monitoring checks of drivers obeying traffic safety regulations, appropriate licensing for vehicle operation, alcohol and drug testing, driving safety, speed restrictions and of vehicle equipment maintenance and working (brakes/horns/mechanics) including maintenance record books; installations of traffic signs; and driving safety education. Testing will be mandatory in case a machine, or workers are involved in the accident. • Traffic management Plans, approved by Police and Consultant with Employer, will be prepared for safe traffic flow on-site and for when vehicles for materials deliveries on the public roads coming to/waste going off- site. • In the event of accidents of any form, a full report will be prepared, filed and a copy provided to the Employer / Engineer.	Contractor	Contractor	Consultant / PCU / Police	During Construction
Local society	The health, safety and wellbeing of local community may be put at risk as a result of the project Potential spread of HIV/AIDs as a result of the project Risk of human trafficking as a result of the project	• HIV/AIDS & Human Trafficking • Insert prevention intervention clauses in construction contracts. • Maximise employment of local labor for construction work. • Focus on behaviour change for workforce, not just raising awareness • Tailor messages to the general workforce, as well as men and women • Provide male and female condoms for construction workers. • Educate construction workers on how to avoid STI, to recognise common STI symptoms, and to seek treatment via confidential referral systems. • Inform workers about the existence of anonymous VCT service (testing, pre-test, and post-test counselling). • Educate construction workers on how to avoid Opportunistic Infections, to recognise common Opportunistic Infections symptoms, and to seek treatment. • HIV/AIDS and Human Trafficking Awareness Program for Communities close to construction sites. • Health, Safety and Wellbeing of Local Society • Awareness materials provided and consultation will be regularly conducted in local communities, ensuring potential issues, complaints and construction inconveniences / impacts are discussed and mutual mitigations in the home are suggested. • Employ local residents for labor, as much as possible to reduce the negative impact that influx of workers may bring. • Workers will be employed locally, where possible, without discrimination of gender, race, religion, and for unskilled positions for low literate. • Avoiding conflicts with local communities by providing resources for worker requirements at works contractor's temporary operational sites. • Avoiding the potential spread of vector borne diseases and communicable diseases, such as STIs and HIV/AIDS by controlling the contact of workers with awareness programmes, and regulation. • Preparing workers to avoid conflict situations through orientation and awareness programmes. • Avoiding damage to utilities by ensuring that vehicles and equipment are operated by trained personnel, and that operations are adequately supervised. • Informing the affected community of the schedule if utilities have to be moved or services are interrupted. • Compliance of safety regulation, laws and Contract requirements. • Development of a health and safety plan required by Contractor. • Slowdown of vehicles in residential and school areas. • Construction vehicles to be restricted outside of hours when children commute to school, including staggered shift hours to avoid peak traffic times in local community areas. • Any damage to the roads due to construction vehicles, shall be repaired by the contractor. • Priority shall be given to employment of local labor (from Ramitan district followed by Bukhara region. • The Contractor, PCU and PIU will implement the Gender Action Plan which focusses on employment and capacity building of locally based men and women. • The contractor will take and ensure the implementation of necessary precautions (signboards, flagman, lighted barriers, and signs) at the entry and exit of all construction sites and in terms of road traffic safety along the road by cooperating with the relevant authority/administration. • Trucks, trailers, and other vehicles to transport necessary equipment and materials will be provided to comply with the speed limits.	Contractor	Contractor	Supervision Consultant / Project Coordination Unit (PCU) / UzSuvta'minot	Before starting construction and During Construction

Environmental / Social Concern	Impact/Issue	Mitigation Measures	Institutional Arrangements			Timing
			Implementing	Responsible	Supervision	
		• If the community has any complaints about transportation activities, the project's grievance mechanism will be utilised, and grievances will be solved in a timely manner by implementing adequate measures/compensations. • The contractor will locate the construction camps in areas that are acceptable from an environmental, cultural, or social point of view. The location of construction camps should be to avoid social conflict in using water, electricity, gas, or other resources or to avoid the possible adverse impacts of the construction camps on the surrounding communities. • The contractor will provide a detailed layout plan for the development of the construction camp showing the relative locations of all temporary buildings and facilities that are to be constructed together with the location of site roads, fuel storage areas (for use in power supply generators), solid waste management and dumping locations, and drainage facilities, prior to the development of the construction camps. • The contractor will ensure security and safety in the project sites. Local authorities responsible for health and security shall be duly informed on the set-up of camp facilities to maintain effective surveillance over public health, social and security matters. • The contractor will ensure proper collection and disposal of wastewater and solid waste within the construction camps to avoid any campsite spillage, contamination, or mess. • The contractor will ensure regular medical checkups of its workers to prevent disease spread into the surrounding villages. • The Grievance Redress Mechanism for Workers and Project separately will be used to record, investigate, and respond to any complaints related to project activities				
Restricted Access	Restricted access to certain areas as a result of project construction	• Contractors will fence the construction site and install visible signs and lights in the construction areas. • If needed, the contractor will arrange bypasses for pedestrians and vehicles and inform the community of a new temporary route before the construction.	Contractor	Contractor	PCU / Bukhoro Suv Ta'minoti JSC / Supervision Consultant	Before starting construction and During Construction
Site Restoration	Risk of improper waste disposa ollowing/during construction	• The contractor will remove all leftover construction material, debris, spoils, and other wastes from the construction sites on time. • The camp's areas will be thoroughly cleaned and restored to their original condition to the extent possible. • No waste disposal will be carried out in streams and/or rivers.	Contractor	Contractor	PCU / Bukhoro Suv Ta'minoti JSC / Supervision Consultant	Before starting construction and During Construction
OPERATIONAL PHASE						
Households connecting and using sewer system	Members of community incorrectly using household connections and manholes, leading to malfunction of the sewage network	• Training of women and men in the use of new technology and associated sewage connections so that maintenance needs and breakdowns are reduced. • Refer to requirements of "DETAILED DESIGN AND OPERATION: CONSIDERING COMMUNITY VIEWS" above.	Project Coordination Unit (PCU)	Supervision Consultant	Project Coordination Unit (PCU)	At the beginning of operation
Water Quality	Water Quantity available and Climate change – Amu Darya basin reduction in available water	• Correct operation and maintenance of the WWTP and the treated water to the collector. • Contractor, with Employer shall include training in aspects of health and safety and emergency situations, with response, by the installed equipment manufacturers. • Water testing to be conducted at the collector at least quarterly to ensure that outfall of wastewater, after tertiary treatment is in accordance with the conditions and parameters standards of the Final Environmental Impact Statement (Russian language acronym – ZEP) as a minimum requirement. • Water quality testing for the above shall be 500m upstream, at outflow and at 500m downstream of mixing point in the collector • Water balance study to be conducted at least twice per year, with trends noted by Bukhoro Suv Ta'minoti JSC and Uzbek Suvta'minot ensuring at least the minimum water to serve SPSs and WWTP operations are available. • The study and water allocations shall also ensure Sewage pipeline network is included. • WWTP produces treated effluents. So, the operation of WWTP improves situation with water resources during dry season.	Bukhoro Suv Ta'minoti JSC	Bukhoro Suv Ta'minoti JSC	Bukhoro Suv Ta'minoti JSC	During Operation
Air Quality and GHG emissions	Risk of GHG emissions as a result of emergency situations during operations (e.g. breakdown in pumping station	• During operations, the sewerage network should have a regular maintenance schedule as well as a plan in place to deal with any breakdowns or emergency situations to prevent stagnation of the flow of wastewater within the sewerage network, thereby mitigating the production of significant GHG emissions. • During operation of the WWTP, the main emissions of GHGs are sludge and wastewater. As such, particular attention must be paid to ensure that these components of the WWTP are in good working order to reduce unnecessary GHG emissions. A SCADA system will aid in quickly identifying any	Bukhoro Suv Ta'minoti JSC	Bukhoro Suv Ta'minoti JSC	Bukhoro Suv Ta'minoti JSC	During Operation

Environmental / Social Concern	Impact/Issue	Mitigation Measures	Institutional Arrangements			Timing
			Implementing	Responsible	Supervision	
	resulting in stagnation of waste water in pipeline network) Risk of increased GHG emissions as a result of poorly maintained WWTP equipment	malfunctions, and an emergency response plan should be put in place to deal with incidents as soon as they become known.				
Odour	Risk of odour emissions as a result of poorly maintained WWTP equipment items (slowing down process of waste water)	• An odour control unit, consisting of a chemical scrubber and biofilter, will be incorporated into the WWTP design to treat the gases before releasing them into the atmosphere. • Correct operation and maintenance of WWTP and SPSs to minimise odours.	Bukhoro Suv Ta'minoti JSC	Bukhoro Suv Ta'minoti JSC	Bukhoro Suv Ta'minoti JSC	During Operation
Occupational and public health and safety	Risk to public health and safety as a result of public potentially gaining access to project infrastructure	• Public awareness, signage and fencing of SPS/WWTP sites is required. • 24 Hour security to prevent public entering potentially dangerous WWTP and SPS operational sites. • The operator shall prepare an Emergency Response Plan, including covering WWTP and/or SPSs accidental equipment failures, hazardous pollution leaks, pre-arranged access to emergency facilities, accident reporting and investigation procedures and redundancy equipment failures (where required).	Bukhoro Suv Ta'minoti JSC	Bukhoro Suv Ta'minoti JSC	Bukhoro Suv Ta'minoti JSC	During operation
Noise Level	Risk of noise nuisance to nearby receptors as a result of SPS and WWTP operations	• Maintenance of silencers and other noise reduction devices at WWTP and Pumping stations. • Transient noise shall be at maximum 90 dBA, or so that noise combined with other ambient noise measures a maximum 120dBA (Uzbekistan standards)	Bukhoro Suv Ta'minoti JSC	Bukhoro Suv Ta'minoti JSC	Bukhoro Suv Ta'minoti JSC	During Operation

12 ENVIRONMENTAL AND SOCIAL MONITORING PLAN (ESMOP)

12.1 Introduction

This section outlines the basis of Environmental and Social Monitoring Plan (ESMoP) for the Ramitan Project, designed to follow on from the Environmental and Social Management Plan (ESMP) set out in the Section 11.

12.2 Key performance Indicators

In addition, Table 12.2 and Table 12.3 provide details of a set of Key Performance Indicators (KPIs) that the Construction Contractors shall aim to achieve throughout the contract period for the ESMoP and provide updates on same, as part of the HSE sections of the Contractor's Monthly Progress Reporting. These KPIs may be adjusted by the employer, contractor, supervision engineer, PCU and external monitoring at the time of the construction contracts being awarded. However, it is assumed that regular measurement for the Project performance will need to occur on a weekly, monthly, annually, and cumulative basis.

Note, for information purposes, Annex 15 provides indicative cost estimates for certain items listed in the below Environmental and Social Monitoring Plan. It should be noted that these indicative prices are not an exhaustive list of the costs of the monitoring and mitigation measures required in this ESIA. They are merely intended to provide local context for the approximate cost ranges of a few specific items, as of the date of this report. This in no way reduces the Contractor's total responsibility to develop their price and methodology, such that it complies with all requirements of this ESIA. The Contractor is required to include for all costs associated with complying with the requirements of the ESIA in their price, not limited to those included in Annex 15.

Table 12.1. Ramitan Environmental and Social Monitoring Plan (ESMoP)

№	Indicator	Parameters of monitoring	Standard or method	Area (location)	Frequency	Responsibility	Oversight
Pre-Construction Phase							
1	Air quality (Baseline)	NOx (NO, NO_2.), SO_2, Suspended solids including most importantly PM2.5 and PM10 (dust))., (CO and CO_2).	Analysis of ambient air quality. Monitoring for compliance with the SanPiN № 0293-11. "Hygienic standards. The list of maximum permissible concentration (MPC) of pollutants in the ambient air of populated areas on the territory of the Republic of Uzbekistan "	Air quality sampling points will be established at preconstruction stage in agreement between the contractor and UzSuvta'minot. As a guide, monitoring locations should be considered at the selected WWTP site; Sludge treatment area within the longest wind direction point; collector canal; and each SPS site and one location in the town to account for residents.	A monitoring programme should be established with UzSuvta'minot by the Contractor. At preconstruction stage, a monitoring programme should be established that will continue into the operations phase.	The construction contractor with PCU, with Supervision Consultant will measure and submit as baseline Monitoring Report	PCU, GOUz and District Environmental Officers
2	Odour	N/A	Odour meter	At selected Sludge treatment area within the longest wind direction point; collector canal; and each SPS site.	1 time directly before construction commencement	The construction contractor with PCU, with Supervision Consultant will measure and submit as baseline Monitoring Report	PCU, GOUz and District Environmental Officers
3	Noise and Vibration	Noise and Vibration rates per Uzbekistan and EHS standard (dBA 55 daytime/45 night) / Vibration	Sound level meter & vibration meter In accordance with SanPiN Uzbekistan standards	Noise and vibration sampling points will be established at preconstruction stage in agreement between the contractor and UzSuvta'minot. As a guide, monitoring locations should be considered at the WWTP site; Sludge treatment area within the longest wind direction point; and each SPS site and the closest residence / shop. Sampling should be conducted at a minimum of 4 locations (in built-up and high acoustic less built-up areas; and well-spaced across pipeline network included in contract area). Shall be approved by discussion with Employer, Supervision Engineer and Contractor.	1 time set directly before construction commencement	The construction contractor with PCU, with Supervision Consultant will measure and submit as baseline Monitoring Report	PCU, GOUz and District Environmental Officers
4	Water Quality	pH, suspended solids, oil products, Sulphates, Chlorides, Ca, Mg, Nitrogen ammonium - Salty Ammonium (NH_4^+), Nitrates, Phosphates, Fluorides, Arsenic, Iron, Chromium, Copper, Zinc, Mercury	Analyse the water quality of collector canals and set the compliance according to the requirements of "Hygienic requirements for surface waters in the Republic of Uzbekistan" (SanPiN0318-15) Fishpond standards.	Monitoring to ensure treated wastewater effluent released into the collector shall be such that ambient water quality (after a reasonable mixing zone (~500m) is in compliance with the Fish Pond standard i.e. in accordance with the requirements of "Hygienic requirements for surface waters in the Republic of Uzbekistan" (SanPiN 0318-15). To be conducted as baseline at each surface water course (Canals, reservoirs etc). Ground water quality sampling will be undertaken at sampling points to be established by the contractor and agreed by UzSuvta'minot.	During design phase to collect baseline data and again before construction commencement	The construction contractor with PCU, with Supervision Consultant will measure and submit as baseline Monitoring Report	PCU, GOUz and District Environmental Officers
5	Structural damage to local buildings and equipment and identified easements	Pre-project status of structures along the length of the pipeline network (including easement's)	Conduct a "crack survey" in Project area Identify and conduct crack survey and maintain measures as per the SDDR recommend requirements for easements.	The full project contract area of pipeline network and SPSs (if any in construction contract) Easements, as identified by SSDR and in case other areas needed as designated easement's	1 time set directly before construction commencement 1 time set directly before construction commencement (also refer to SDDR instructions).	The construction contractor with PCU, with Supervision Consultant will measure and submit in a baseline Monitoring Report	PCU, GOUz and District officers of Construction Ministry
6	Community Awareness of Project	Minutes/Protocol of Meetings with affected communities, Mahalla's and District Copies of awareness materials and photographic evidence of meetings taking place	In compliance with AIIB standards and SDDR requirements	District and Mahalla within each Construction Contract	1 time set directly before construction commencement (also, refer to SDDR instructions).	The construction contractor with PCU, with Supervision Consultant will measure and submit in a baseline Monitoring Report	PCU, GOUz and District officers of Construction Ministry
Construction Phase							
1	Air quality and GHGs	NOx (NO, NO_2.), SO_2, Suspended solids including most	Analysis of ambient air quality. Monitoring for compliance with the SanPiN № 0293-11. "Hygienic	Air quality sampling points will be established at preconstruction stage in agreement between the contractor and UzSuvta'minot. As a guide,	A monitoring programme should be established with UzSuvta'minot by the Contractor	The Contractor shall use an independent laboratory testing service to measure and submit	PCU, GOUz and District Environmental Officers

№	Indicator	Parameters of monitoring	Standard or method	Area (location)	Frequency	Responsibility	Oversight
		importantly PM2.5 and PM10 (dust), (CO and CO_2).	standards. The list of maximum permissible concentration (MPC) of pollutants in the ambient air of populated areas on the territory of the Republic of Uzbekistan "	monitoring locations should be considered at the selected WWTP site; Sludge treatment area within the longest wind direction point; collector canal; each SPS site and one location in the town to account for residents.	at pre construction phase, which will continue into the construction phase. An agreement between the Contractor and UzSuvta'minot should be made on regarding how the monitoring programme should be adjusted during the construction phase. Note this is in addition to the "pre-construction" timeline above.	to client / Engineer in Quarterly Environmental monitoring Reporting during construction of each SPS and WWTP The results will be included in the Environmental Monitoring Reports of Contractor and Supervision Engineer consultant.	
2	Wastes	The type, quantity of waste, storage conditions, waste utilization Permits required Recycling / reuse / disposal	Control of accumulation, temporary storage, movement to the recovery / recycling in accordance with Waste Management Plan In accordance with Uzbekistan waste management standards of categories I-V All hazardous wastes shall follow international EHS standards, especially PCBs and asbestos related materials managed as per International environmental protocols	At selected WWTP site; Sludge treatment area within the longest wind direction point; collector canal; and each SPS site. Also record to be kept by contractor on reuse and recycled waste Products. Observation on the over-ordering of building materials leading to higher levels of waste	Daily tally of separated wastes and reported monthly	The Contractor shall measure separated waste accumulation as well as recycled, reused, disposed off-site Submit results to employer / Engineer in General Project Progress Reports and Quarterly Environmental monitoring Reports, including copy of permits or contracts for waste taken off site.	PCU, GOUz and District Environmental Officers
3	Soil and silt Condition of soil and silt – Quantity of excavated and reinstated / recycled; erosion, conservation, and quality.	Soil Quantity by: Control volumes of excavated spoil and topsoil transported from site and/or stockpiled / reused / recycled: Topsoil stripped. Subsoils excavated, stockpiled, and reinstated to site. Subsoils excavated, stockpiled, and nit reinstated to sites Materials brought onto site subject to engineer specification.	Records by cubic metres or tonnes of excavated soil and subsoil and how much is left on site and what and quantities of transported excavated materials moved off site to offsite stockpile and/or to disposal sites Use of erosion control on the construction site such as silt catchment close to water courses Storage of topsoil – covered for of other method of dust control, removing weeds as needed, other methods of erosion control.	The territory SPS, WWTP and stockpile sites, and Pipeline network trench area	Daily records kept of weights and movement of materials, to be reported monthly during construction Reporting: withing the contractor monthly report; and Quarterly Environmental Monitoring Reports	The Contractor shall measure excavated, stockpiled and waste disposal of material; and material brought in as fill. Submit results to employer / Engineer in General Project Progress Reports and Quarterly Environmental monitoring Reports, including copy of permits or contracts for waste taken off site.	PCU, GOUz and District Environmental Officers
4	Soil and silt Quality of material excavated and reinstated / recycled; erosion, conservation, and quality of water courses. Soil quality on pipeline network excavation sites, specifically the spoil that is envisaged to be recycled, used in reinstatement of subsoil lavers in the pipeline network trenches.	Condition of soil Quality of: Excavated material from the sites (e.g. Topsoil, sub-soils excavated that may be of engineer specification to reinstate around new construction contaminated site. Excavated material from the sites measured for quality, especially for hazardous materials - Status and protection from oils and hazardous materials. Reinstatement and new materials are uncontaminated material.	Quality of soils: to be excavated (topsoil and subsoil layers) and measured for parameters including, but not limited to: pH Petroleum Products Lead Other potential contaminants (if known) Inspection and visual observation of contamination. Inspection and visual observation siltation to waterways caused by construction. Siltation near water courses caused by construction works near water courses. Water quality samples (refer to Surface Water Quality Indicator 6 below also):	The territory SPS, WWTP and stockpile sites, and Pipeline network trench area	Soil quality: measured 2 times: i.e.. prior to construction commencement, and of material that will be recycled (Refer to Surface Water Quality Indicator 3 above) Reporting: within the contractor monthly report; and Quarterly Environmental Monitoring Report. Refer to Surface Water Quality Indicator 6 below.	The Contractor shall recruit an independent testing laboratory. Submit results to employer / Engineer in General Project Progress Reports and Quarterly Environmental monitoring Reports, including copy of permits or contracts for waste taken off site. Observation Inspection by contractor and by Supervision consultant engineer.	PCU, GOUz and District Environmental Officers

№	Indicator	Parameters of monitoring	Standard or method	Area (location)	Frequency	Responsibility	Oversight
			pH. Suspended solids. oil products. Other known potential Contaminants and Hazardous substances.				
4	Noise and Vibration	Noise rates per Uzbekistan and EHS standard (dBA 55 daytime/45 night) Vibration rates per British Standard BS 7385-2:1993 Evaluation and Measurement for Vibration in Buildings - Guide to Damage Levels from Ground Borne Vibration and British Standard BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Vibration. Where vibration levels exceed 15 mm/s at low frequencies rising to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above.	Sound level meter & vibration meter in accordance with SanPiN Uzbekistan standards	Noise and vibration sampling points will be established at preconstruction stage in agreement between the contractor and UzSuvta'minot. As a guide, monitoring locations should be considered at the WWTP site; Sludge treatment area within the longest wind direction point; and each SPS site and the closest residence / shop. Sampling should be conducted at a minimum of 4 locations (in built-up and high acoustic less built-up areas; and well-spaced across pipeline network included in contract area). Shall be approved by discussion with Employer, Supervision Engineer and Contractor.	Monthly and reported Quarterly (some may be measurable monthly and others best quarterly and will be determined by Contractor in the Site Specific ESMoP Note this is in addition to the "pre-construction" timeline above	Monthly and reported Quarterly (some may be measurable monthly and others best quarterly and will be determined by Contractor in the Site Specific ESMoP	PCU, GOUz and District Environmental Officers
5	Flora and Fauna	Animal species, plant species on site; complaints from off-site on damage to flora/fauna habitats.	By observation of rare and endangered species (as per Section 6.	Onsite and within 500m off-site	Continuous	The Contractor shall record and observations and provide in quarterly and monthly reporting	PCU, GOUz and District Environmental Officers
6	Surface Water Quality and ground water quality	pH, suspended solids, oil products, Sulphates, Chlorides, Ca, Mg, Nitrogen ammonium - Salty Ammonium (NH_4^+), Nitrates, Phosphates, Fluorides, Arsenic, Iron, Chromium, Copper, Zinc, Mercury	Analysis the water quality of and set the compliance according to the requirements of "Hygienic requirements for surface waters in the Republic of Uzbekistan" (SanPiN0318-15) Fishpond standards. Additionally, by inspection/observation	Monitoring to ensure treated wastewater effluent released into the collector shall be such that ambient water quality (after a reasonable mixing zone (~500m) is in compliance with the Fish Pond standard i.e. in accordance with the requirements of "Hygienic requirements for surface waters in the Republic of Uzbekistan" (SanPiN 0318-15). To be conducted at each surface water course (Canals, reservoirs etc) in the locations of contracted pipeline network areas, during site specific construction in the specified alignment areas. Ground water quality sampling will be undertaken at sampling points to be established by the contractor and agreed by UzSuvta'minot.	WWTP: Monthly and reported Quarterly (some may be measurable monthly and others best quarterly and will be determined by Contractor in the Site Specific ESMoP Network: Minimum 2 time set during and after site specific construction or quarterly (depending on which is most frequent). Note this is in addition to the "pre-construction" timeline above	The Contractor shall use an independent laboratory testing service to measure and submit to client / Engineer in Quarterly Environmental monitoring Reporting during construction.	PCU, GOUz and District Environmental Officers
7	Core labour standards and conditions	Compliance with labour laws, regulations and safety regulations No child labour; men/women equal pay for equal work and position level; no people trafficking; HIV awareness, gender and antidiscrimination, gender separate living conditions and ablutions according to contract standards and ILO requirements. Contractor will prepare and implement an occupational health and safety plan as part of the CESMP.	Data collection survey tabulating: Numbers of personnel from local district, from other areas of Uzbekistan and other countries; numbers of various types of skilled/unskilled/professional workers on the project and age ranges; Salary ranges for each type of skilled / unskilled / professional workers on the project; and hours of shifts for each type of skilled / unskilled / professional workers on the project. Attendance evidence, training materials, photographs and summary of topics covered in training of HIV/AIDS/STD training, induction	In all territories of construction site and camps	Constantly by contractor and reported each month in monthly reports of contractor on a quarterly basis by Consultant / Employer	The Contractor shall submit to client / Engineer in Quarterly Environmental monitoring Reporting during construction	PCU, GOUz and District level Ministry of employment and labour relations Officers and State Committee of Industrial Safety

№	Indicator	Parameters of monitoring	Standard or method	Area (location)	Frequency	Responsibility	Oversight
			training and other Health and Safety training. Regular site, camps, stockpile, material processing, workshop, and office inspection audits.				
8	Accident	Compliance with labour Health and safety laws, rand safety regulations and contract conditions	Surveying and audits Incident reports Results of investigation of serious cases by law enforcement authorities.	In all territories of construction site	Constantly Quarterly audit	The Contractor will submit to Employer / Engineer Quarterly Environmental Monitoring Reports with incident management reporting. Engineer/Client will audit	PCU and Supervision Consultant
9	Complaints and Grievances	The numbers, content and results of the processing of complaints Complaints resolved and how resolved	Register Minutes of meetings Data on resolutions, accepted as resolved, taken to next level of GRS.	In all territories of construction site	Daily recoding and monitoring GRC Meetings will be in accordance with GRS approach (refer to Section 8 above	Client, Contractor, and Consultant nominated GRM Focal Points. Reporting Quarterly, but follow-up as per establish Complaints systems for the Project.	PCU and Supervision Consultant
10	Awareness of Contractor / workers on the Project	Minutes/Protocol of Meetings with workers Copies of awareness materials and photographic evidence of meetings taking place Mandatory summary of topics covered in training of HIV/AIDS/STD training, induction training and other Health and Safety training.	In compliance with AIIB standards and SDDR requirements	All locations of contractor workers and management pipeline network contractors	1 time set Induction for new workers and quarterly refresher courses ongoing labour units	The construction contractor to be include in Environmental Monitoring Reports of Contractor (Also refer to KPIs)	PCU, GOUz
11	Trees and Vegetation Damage	Law on tree cutting moratorium shall be respected Number, type, magnitude of trees to be pruned for access of construction area. Avoidance methods for trees and pruning.	Observations Permits obtained from Environmental authorities for trimming Evidence of written permission to prune trees or relocate pipeline alignment Measurement of vegetation (and type of vegetation) to be removed in construction and provision of rehabilitation plan.	All construction sites / camps / stockpile and workshop sites	Constantly at long-term sites. Commencing and completion of specifically affected construction sites	Submit copies of permits to prune along with rehabilitation plans for approvals by employer / Engineer in General Project. Quarterly Environmental Monitoring Reports, of Contractor followed by Supervision Consultant, copies of permits to prune, waste management practice and revegetation and tree rehabilitation program.	PCU, GOUz and District Environmental Officers
12	Landscaping, Including Planting of trees and other vegetation	the WWTP, SPS, and borrow pits and other contractor used sites shall be reinstated and landscaped to the employer and/or landlord/owner satisfaction or per agreement made between contractor and owner of the area.	Reuse of soil is all areas Planting of endemic trees and trees that will grow robustly in the Ramitan environment Planting of local vegetative species. Contractor will ensure survival of the vegetation until the end of the post-project guarantee period.	In all territories used in the Project	Trees planted, Area of vegetative growth and sustaining vegetation and tree growth Visual inspection	The Contractor shall submit to client / Engineer in Quarterly Environmental Monitoring Reporting during construction of contracted project pipelines network	PCU and Supervision Consultant
Operation Phase: (to be updated and confirmed/updated during Uzbekistan legal Final EIA (ZEP) process before commissioning of each the WWTP and SPSs)							
1	Air quality and GHGs	NOx (NO, NO_2.), SO_2, Suspended solids, NO, CH_4, PM2.5 and PM10 (dust), CO and CO_2.	Analysis of ambient air quality. Monitoring for compliance with the SanPiN № 0293-11. "Hygienic standards. The list of maximum permissible concentration (MPC) of pollutants in the ambient air of	Air quality sampling points will be established at preconstruction stage in agreement between the contractor and UzSuvta'minot. As a guide, monitoring locations should be considered at the selected WWTP site; Sludge treatment area within the longest wind direction point; collector	Quarterly for first 2 years post-project; and then semi-annually for the next 3 years or as Government requires (whichever is more frequent and most stringent)	System Owner / Operator with District Environmental Department	

№	Indicator	Parameters of monitoring	Standard or method	Area (location)	Frequency	Responsibility	Oversight
			populated areas on the territory of the Republic of Uzbekistan " compared to MPC before and during construction (see above).	canal; each SPS site and one location in the town to account for residents.	Ad-hoc measurement in cases of observation at times of operation or faults or equipment failure		
2	Odour	Use Pre-construction data results as a baseline comparison	Odour meter	At Sludge treatment area within the longest wind direction point; collector canal; and each SPS site.	Monthly and in case of complaints from community	System Owner / Operator	
3	Sewage effluent from Plant / Water quality and collector canal water quality	Temperature, pH, suspended solids, salinity, biological oxygen demand, chemical oxygen demand, the dissolved oxygen, total nitrogen, total phosphorus, nitrites, nitrates, sulphates, chlorides, calcium, sodium, potassium, iron, magnesium, trivalent chromium, hexavalent chromium, copper, zinc, lead, cadmium, arsenic, oils, phenols, cyanides.	Analysis of the quality of wastewater for compliance with the SanPiN №0318-15. "Hygienic requirements for surface waters in the Republic of Uzbekistan"	Monitoring to ensure treated wastewater effluent released into the collector shall be such that ambient water quality (after a reasonable mixing zone (~500m) is in compliance with the Fish Pond standard i.e. in accordance with the requirements of "Hygienic requirements for surface waters in the Republic of Uzbekistan" (SanPiN 0318-15). Note that WWTP technical design requirements stipulate no overflows are permitted. Ground water quality sampling will be undertaken at sampling points to be established by the contractor and agreed by UzSuvta'minot.	Monthly Ad hoc measurement in cases of observation at times of operation or faults or equipment failure	System Owner / Operator	
4	Wastes	The type and quantity of waste, separated as per Uzbekistan laws storage conditions, waste utilization	Control of accumulation, temporary storage, movement to the recovery / recycling in accordance with Waste Management Plan	The territory of the pipeline network specific section and/or SPSs, and WWTP at times of maintenance.	Quarterly reporting to Uzbekistan authorities Ad-hoc measurement during maintenance periods in cases of observation at times of operation or faults or equipment failure.	System Owner / Operator	
5	Noise and vibration	Noise and Vibration rate as per Uzbekistan standard (dBA 55 daytime / dBA 45 night in community & dBA 80 at closest permanent work station.)	Sound level meter vibration meter	Noise and vibration sampling points will be established at preconstruction stage in agreement between the contractor and UzSuvta'minot. As a guide, monitoring locations should be considered at the WWTP site; Sludge treatment area within the longest wind direction point; and each SPS site and the closest residence / shop. Sampling should be conducted at a minimum of 4 locations (in built-up and high acoustic less built-up areas; and well-spaced across pipeline network included in contract area). Shall be approved by discussion with Employer, Supervision Engineer and Contractor.	Quarterly for first 2 years post-project; and then semi-annually for the next 3 years or as Government requires (whichever is more frequent and most stringent) Ad-hoc measurement in cases of observation at times of operation or faults or equipment failure	System Owner / Operator	
6	Labour and conditions of labour	Compliance with labour laws, regulations and safety regulations.	Data collection survey tabulating: Numbers of personnel from local district, from other areas of Uzbekistan and other countries; numbers of various types of skilled/unskilled/professional operation team of workers on the project and age ranges; Salary ranges for each type of skilled / unskilled / professional workers on the project; and hours of shifts for each type of skilled / unskilled / professional workers on the project.	The territory of the SPSs and WWTP facilities During routine and emergency maintenance procedures of pipelines, manholes and SPSs	Constantly Ad-hoc measurement in cases of observation at times of operation or faults or equipment failure. Reporting Quarterly to Uzbekistan Government authorities	System Owner / Operator	
7	Accident and Emergency Situations	Compliance with labour laws, regulations, and safety regulations (refer to indicator 8) Records of emergency from Equipment failure or severe	Incident records Emergency Management Plan (EMP) is prepared. Regular EMP updates	The territory of the SPSs and in case of maintenance required at SPS, parts of pipeline and/or WWTP (to a magnitude impacting on sewage transporting and arrival at Plant)	Constantly At Commissioning time Update annually and if a major incident emergency occurs.	System Owner / Operator	

№	Indicator	Parameters of monitoring	Standard or method	Area (location)	Frequency	Responsibility	Oversight
		climatic and other emergency events,					
8	Complaints	The numbers, content and results of the processing of complaints Complaints resolved and how resolved	Registration Minutes of Meetings	In all territories of Project	Daily	System Owner / Operator	
9	Water quality at water course where pipeline network operates, in case of emergency leakage	Temperature, pH, suspended solids, salinity, biological oxygen demand, chemical oxygen demand, the dissolved oxygen, total nitrogen, total phosphorus, nitrites, nitrates, sulphates, chlorides, calcium, sodium, potassium, iron, magnesium, trivalent chromium, hexavalent chromium, copper, zinc, lead, cadmium, arsenic, oils, phenols, cyanides.		At by observation and complaint by community or equipment failure of SPS or leaking pipe identified.	Quarterly or if emergency is detected Ad hoc measurement in cases of observation at times of operation or faults or equipment failure	System Owner / Operator	

Table 12.2 Environmental and Social KPIs

Environmental/Social KPIs		
1.0	**Environmental Management System**	**Target**
1.1	Environment/Social Audits completed vs planned	%100
1.2	Environment/Social Trainings completed vs planned	%100
1.3	Total % of Environmental/Social non-compliances closed within the agreed timeframe	%100
2.0	**Pollution Prevention-Air Quality**	**Target**
2.1	% of monitoring results compliant with legal standards (as per and International standards & requirements)	%100
2.2	# of complaints received related to dust and/or odours	0
3.0	**Pollution Prevention-Noise & Vibration**	**Target**
3.1	% of monitoring results compliant with legal standards (as per Uzbekistan standards & requirements)	%100
3.2	# of complaints related to noise	0
4.0	**Pollution Prevention-Land**	**Target**
4.1	# of spills to land of volume greater than 100 litters	0
5.0	**Water Management**	**Target**
5.1	% of tests/samples compliant with legal standards for canal water (as per and International standards & requirements)	%100
5.2	% tests/samples compliant with legal standards for potable water (as per and international standards & requirements)	%100
5.3	# of complaints received regarding negative impact to third party water quality or quantity	0
5.4	% of non-compliances raised by Employer/Engineer which are closed within agreed timeframe	%100
5.0	**Waste Management**	**Target**
5.1	Non-hazardous waste generated (kg)	N/A
5.2	Hazardous waste generated (kg)	N/A
5.3	Waste recycled/reused (kg)	N/A
5.4	% of non-hazardous & hazardous waste disposal compliant with legal requirements (as per and International standards & requirements)	%100
6.0	**Natural Environment-Eco System**	**Target**
6.1	# of Project related injured/dead fauna	0
6.2	# of incident/damage to sensitive areas	0
7.0	**Geology and Soil**	**Target**
7.1	# of non-compliances related to topsoil/subsoil segregation	0
7.2	% of Quarry sites used that are properly licensed	%100
8.0	**Traffic Management**	**Target**
8.1	# of Traffic or access related complaints received	0
8.2	# of Traffic incidents involving third parties	0
9.0	**Cultural Heritage**	**Target**
9.1	# of known archaeological/cultural heritage site damages during construction activities	0
10.0	**Labor**	**Target**
10.1	# of Workers	N/A
10.2	Man-hours worked	N/A
10.3	Age	N/A
10.4	% of staff employed from project district, and International as per legal requirements	%100
10.5	% level of Females employed throughout all phases of the Project	%15

Table 12.3 Health and Safety KPIs

HSE Performance Criteria		Week	Month	Cum.
Project / Data Period	Total Manhours Worked			
	Number of Personnel			
	Total Manhours Worked without LTI			
	Total Days Worked without LTI			
	No. of HSE Staff			
Incidents & Accidents	Lost Time Injury Frequency (LTIF)			
	Total Recordable Injury Rate (TRIR)			
	No. of Fatalities (FAT)			
	No. of Lost Time Injuries (LTI)			
	No. of Restricted Work Cases (RWC)			
	No. of Medical Treatment Cases (MTC)			
	No. of First Aid Cases (FAC)			
	No. of Property Damage (PD)			
	No. of Environmental Accidents (EA)			
	No of Traffic Accidents (TA)			
	No. of Near Misses (NM)			
Trainings & Awareness	HSE Inductions (manhours)			
	Number of Attendees to HSE Inductions			
	Specific HSE Trainings (manhours)			
	Number of Attendees to Specific HSE Trainings			
	External HSE Trainings (manhours)			
	Number of Attendees to External Trainings			
	Social Trainings (manhours)			
	Number of Attendees to Social Trainings			
	Total Trainings Manhours			
	Number of Tool- box Talks			
	Number of Attendees to Tool-box Talks			
Audits & Inspections & Walkdowns & Meetings & Observations	Number of Inspections			
	Number of HSE Walkdowns			
	Number of internal HSE Audits			
	Number of external HSE Audits			
	Number of Environmental/Social Audits			
	Number of HSE Meetings			
	Number of HSE Observations			
	Number of HSE Observations - Closed			
Environmental / Social Management	Environmental Monitoring performed (in detail)			
	Waste Generated (non-hazardous/hazardous) (in detail)			
	Number of Environmental related complaints			
	Number of Social related complaints			
	Number of non-compliances raised by Employer/Engineer			
	Number of Environmental/Social non-compliances - Closed			

13 INSTITUTIONAL ARRANGEMENTS

13.1 General Institutional Arrangements

JSC "UzSuvta'minot", as the PIE, is responsible for all aspects of the project implementation and ultimately answerable to the Ministry of Investment of the Republic of Uzbekistan and the AIIB. The PIE's PCU team shall be tasked with day-to-day management of the project, including regular liaison with the AIIB and monitoring of contact with consultants and contractors.

A Construction Supervision Consultant has been appointed by the PIE and works in close cooperation with their PCU team. Part of the Construction Supervision Consultant's role is to ensure the ESIA and ESMP requirements are fully implemented on site, in addition to technical aspects of the construction contracts.

13.2 Environment, Social, Health and Safety Arrangements

A suitable number of qualified personnel shall make up the Contractor's Environmental, Social, Health and Safety (HSE) staff. Uzbekistan Nationals must be a part of this group, a minimum requirement. Numbers of workers will determine the number of HSE staff that are employed at a specific time. A recommended guide to the Contractor is to have the following numbers of HSE personnel on site at one time, unless there is an Uzbekistan Legal requirement which is more stringent:

- 20-50 workers = 2 to 4 personnel, at least one qualified Environmental and 1 Health and Safety Specialist, with a dedicated vehicle; and
- 50-200 workers = 4 to 8 personnel, at least one qualified Environmental specialist, 1 Social Specialist and 1 Health and Safety Specialist, with a dedicated vehicle.

The department Head, or Deputy, will be required to be on-site at all times to ensure full Health, Safety, Social and Environmental requirements are fully complied with from the beginning of:

- ***Pipeline and SPS construction contracts*** - The first mobilisation on site to Ramitan, to enable them to supervise the contractor works from the start of construction contract and continue through the period on the pipeline network and SPS pre-construction, construction, commissioning and post-construction guarantee period.
- ***WWTP*** - At the beginning of the detailed design phase as well as first mobilisation on site to Ramitan, to enable them to supervise the contractor works from the start of construction contract and continue through the period on the pipeline network and SPS pre-construction, construction, commissioning and post-construction guarantee period to the period of handover at the end of the Project.

The following minimum Scope of Works will be performed by the Contractor's Environmental, Social, Health and Safety personnel:

- Manage all Health, Safety and Environmental management and Monitoring requirements under the contract on behalf of the Contractor and all personnel on the site.
- Prepare and implement a Site-Specific Environmental Management Plan, taking into account the detailed design prepared by the Designers and Consultant and the clients ESMP and other documentation.
- Prepare and implement a Site-Specific Environmental Monitoring Plan, taking into account the detailed design, clients ESMoP, and measuring site conditions at the time.

- Conduct baseline environmental studies on-site prior to construction commencement, and present in submission with ESMP Note that the contractor, with client/PCU shall be required to engage the services of a fully Uzbekistan certified laboratory licenced to take field samples, conduct appropriate laboratory analyses and report results, as per requirements.
- Ensure WWTP design and construction activities are compliant with international, and Uzbekistan specified standards.
- Monitor labor conditions in accordance with Contract (and EMP/ESMoP, donor and Uzbekistan requirements, policies and laws).
- Ensure Health and Safety and Traffic Management are fully implemented and strictly compliant with the highest standards, especially for the Pipeline construction contract, and all contracts when there will be heavy movement of machines, trucks and materials to/from sites.
- Provide monthly and quarterly Environmental Monitoring Reports on environmental management and monitoring in accordance with the environmental management plan, to the client and supervision engineer.
- As instructed by the client from time to time.

14 ENVIRONMENTAL AND SOCIAL TRAINING

It is understood that most personnel managing the Project, including Government officers, NGO workers, construction management and supervision consultants will all have certain, but different levels of understanding of environmental, social, and health and safety aspects (ESHS). For example, some stakeholders will understand the HSE Regulations to implement in Uzbekistan and others more familiar with HSE international standards or the AIIB Environmental and Social Framework.

In order to ensure all of these stakeholder groups have similar capacity levels to work together on the Project implementation, it is important that a training and capacity building assessment is conducted. This will allow training in E&S safeguards implementation to be conducted from the necessary levels compatible with the stakeholders.

14.1 Training Needs Assessment (TNA)

A TNA will be an important first step, to understand the level of training in ESHS issues. TNA questions recommended include the following areas:

- Experience with donors
- Experience with donors E&S safeguards
- Types of Training methods normally used
- Training venues
- Other information about potential participants

14.2 Training Approach

It should be noted that the different stakeholders will have experienced varying modes of training and capacity building, from direct lectures and exams, to fieldwork, to on-the-job training. In order to conduct a training program which encapsulates all stakeholders, the recommended approach to E&S Training and Capacity Building is to involve a lecture style in-class methods plus an optional site visit as follows:

- A morning session at a venue close to the Project site, during which, a series of lectures covering each of the AIIB Environmental and Social and International ESHS aspects to be implemented on the Project;
- ESHS and related legal framework and policies and procedures of Uzbekistan, as they relate to the Project. The morning session is designed to not only introduce the concepts and theory but also present, in lecture format, some known local example(s) (i.e. presenting key points of a practical example to illustrate each key concept/theory presented); and
- An afternoon session, which may be optional, may be designed as an on-site visit to the WWTP and to SPS and pipeline networks areas. This session can be used to point out in practice, some of the requirements and issues that are in this ESIA and ESMP along with recommended development Plans (refer to Section 12 and 13 above) development and E&S implementation.

The project will support relevant training activities to be implemented by PMC and Contractor(s) on environmental and social topics provided in the table below.

Table 14.1 Environmental and Social Training and Capacity Building Activities

Training/Capacity Building	Training Provider	Training Participants	Period
Training in ESMP	PMC	Contractor	Upon signing the contract and prior any construction activities
Training in waste disposal practices and procedures, including training on hazardous waste management	Contractor	Contractor's personnel	Prior construction activities and during the civil work
Training in OHS (equipment and machinery maintenance, specific hazards of their work, first aid, basic sanitation, and health care) and environmental protection, GRM and gender issues	Contractor	Contractor's personnel	Prior construction activities and during the civil work
Training in the code of conduct, engaging with the local community, community health and safety, and GBV risks	PMC and contractor	Contractor's personnel	Prior construction activities and during the civil work
HSE Induction for all persons entering the site	Contractor	Contractor's personnel, any sub-contractors, PMC, PCU and all visitors to site	Prior to individuals entering construction / contractor site. Contractor HSE personnel may choose to provide a refresher course to reinforce induction information during the Project implementation.

14.1 Training for Women

Training should be implemented to ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life.

Below are actionable steps that can be implemented in training:

- Skill-Building: Provide vocational training and financial literacy programs to help women gain economic independence.
- Leadership Development: Offer leadership, public speaking, and advocacy training to prepare women for leadership roles.
- Empowerment through Knowledge: Educate women about their legal rights, access to resources, and social services.
- Participation in Decision-Making: Create platforms for women to voice their concerns and engage in governance and political processes.
- Addressing Barriers: Offer programs to combat gender-based violence, discrimination, and societal norms that limit women's roles.
- Partnerships and Advocacy: Build networks and partnerships with local leaders and organizations to support women's leadership and gender equality.
- Sustaining Impact: Monitor and evaluate programs, provide ongoing support, and promote women's networks for continued empowerment.

These efforts aim to empower women, ensuring their active participation and leadership in all aspects of society.

ANNEX 1 – DRAFT ENVIRONMENTAL IMPACT ASSESSMENT (ZVOS)

“APPROVE”

DIRECTOR OF
LLC “BUKHORO SUV TA’MINOTI”
M. AMONOV

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«_____» _____ 2023

DRAFT (EIS)
ENVIRONMENTAL IMPACT STATEMENT

UNDER THE DEVELOPMENT AND MODERNIZATION OF SEWERAGE SYSTEMS AND WASTEWATER TREATMENT PLANTS LOCATED ON THE TERRITORY OF ROMITAN CITY, ROMITAN DISTRICT, BUKHARA REGION.

Tashkent 2023

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INTRODUCTION

The work purpose is to assess the environmental impact of “Development and modernization of sewerage systems and wastewater treatment plants” located on the territory of the Romitan city, Bukhara region.

The basis for the project implementation is the following:

- Resolution No. 794 of the Cabinet of Ministers of the Republic of Uzbekistan dated 21.09.2019 “ON MEASURES FOR THE INTEGRATED SOCIO-ECONOMIC DEVELOPMENT OF THE BUKHARA REGION IN THE PERIOD OF 2019 — 2023”.
- Presidential Decree No. 3857 dated 16.07.2018.

The sewerage system construction of the Romitan district centre, Bukhara region is caused by the need to solve the problem of sewerage and wastewater treatment of the Romitan district centre. The main aim of the design solutions is to improve the environmental and sanitary-epidemiological situation, health and living conditions of people residing in the Romitan district centre. The sewerage system construction will solve the problem of wastewater and sludge treatment at wastewater treatment plants by bringing the quality of effluents up to regulatory requirements.

The operation of sewerage systems will be achieved by:

- construction of wastewater treatment plants with a capacity of 5,045 thousand m^3/day;
- construction of sewage pumping stations;
- construction of sewer networks and collectors to cover the population with sewerage services.

The sewage system accepts household and fecal wastewater from the population, public and communal institutions, and domestic and industrial wastewater of industrial enterprises of the Romitan district centre, Bukhara region.

Pollutant emissions will be released into the atmospheric air, and waste production and consumption will be generated during the construction of sewerage systems.

The impact sources shall be identified in order to assess the forecast state of the natural environment in the studied area.

Additional environmental protection measures shall be developed and monitoring of changes in environmental components shall be organized to mitigate the negative impacts during the construction of sewerage systems.

The draft EIS was implemented in accordance with environmental legislation and regulatory documents of the Republic of Uzbekistan, including:

- The Law of the Republic of Uzbekistan “On Ecological Appraisal”;

- The Law of the Republic of Uzbekistan “On Environmental Protection”;

- The Law of the Republic of Uzbekistan “On Atmospheric Air Protection”;

- The Law of the Republic of Uzbekistan “On Water and Water Use”;

- Sanitary norms and rules for the atmospheric air protection in populated areas of the Republic of Uzbekistan SanPiN No. 0325-16, Tashkent, 2016;

- Sanitary norms and rules, hygienic standards of the Republic of Uzbekistan on permissible noise levels in workplaces SanPiN No. 0293-11, Tashkent, 2011;

- A list of Emission Limit values (ELV) of pollutants in the atmospheric air of populated areas on the territory of the Republic of Uzbekistan approved by the Ministry of Health of the Republic of Uzbekistan.

- The State standard of the Republic of Uzbekistan O'ZDST 951:2011 Hygienic, technical requirements and rules for the selection of “Sources of centralized drinking water supply”;

- The State standard of the Republic of Uzbekistan O'ZDST 950:2011 Hygienic requirements and quality control of “Drinking water”.

The draft EIS was implemented in accordance with the requirements of the Law “On Environmental Expertise” and Resolution No. 541 of the Cabinet of Ministers of the Republic of Uzbekistan dated 07.09.2020. The enterprise belongs to the III category of environmental hazard (item 15 – Wastewater Treatment Plants with a capacity of less than 50 thousand m^3/day).

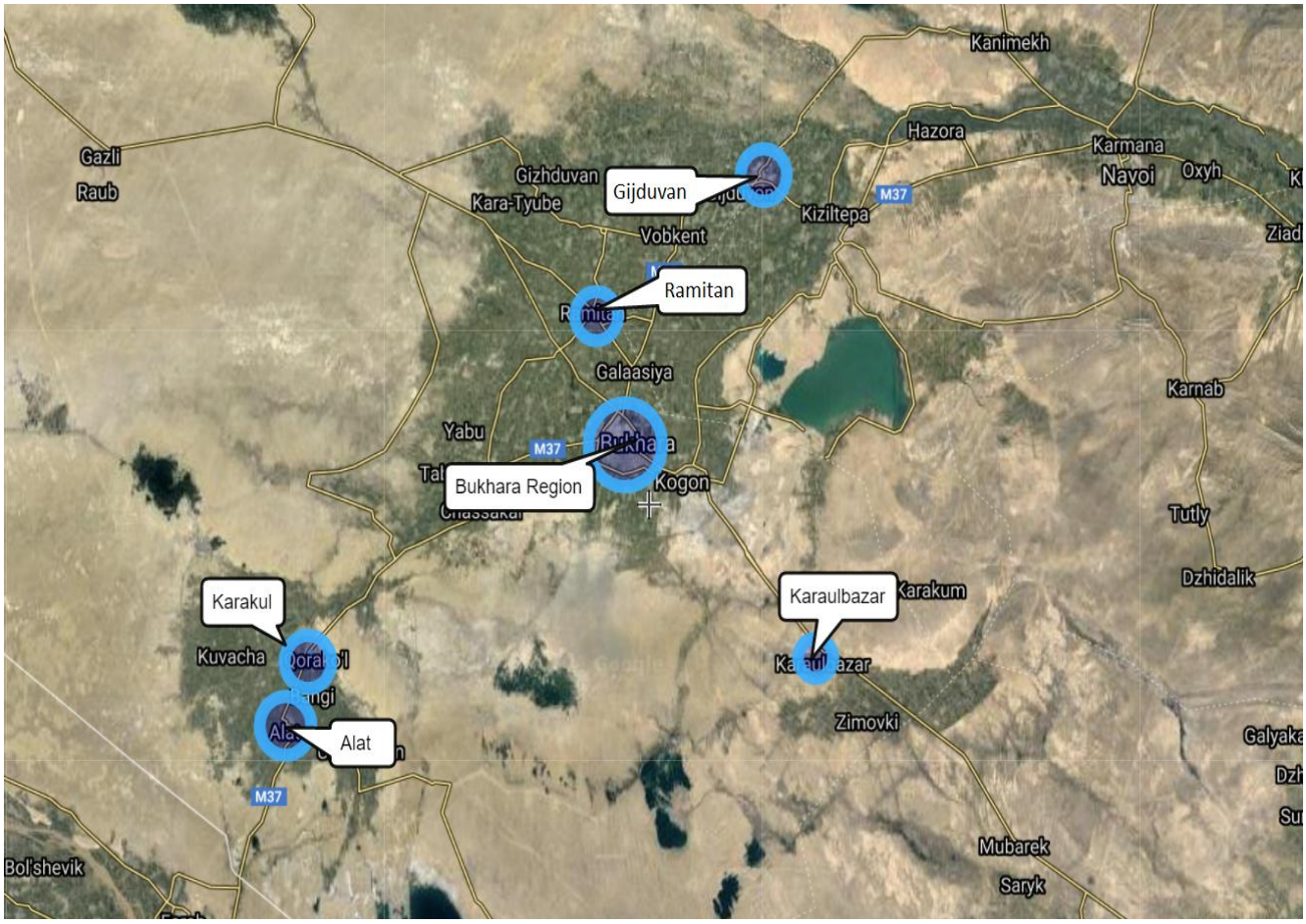
1. CONDITION OF THE ENVIRONMENT IN THE SEWER INFLUENCE AREA

1.1 Location and existing sources of terrain transformation

The considered area designed for the construction of sewer networks and wastewater treatment plants for residential buildings in the Romitan city located on the territory of Romitan district of the Bukhara region. The population is 15,200 thousand people. There is a sewage system for the households in Romitan. The city hospital has departmental treatment facilities which are located in the southern part of the city. The entire population uses local sanitary systems available on their house plots, such as cesspools and septic tanks.

Satellite image of the location of the sewer network construction site

Coordinates - 34°55'54.55"N, 64°22'20.63"E



1.2 Brief description of the physical-geographical, climatic conditions and ecological situation of the area

CLIMATE

The climatic features of the district were given according to data of the Bukhara weather station.

The location of district centre and its vicinity on an open plain bordered by deserts in the west, and in other directions – with the Karshi and Karnabchul steppes, determines the sharply continental nature of the climate.

According to the average data, the average annual air temperature in the considered area is +15.8°C, with an absolute maximum temperature in July of + 46.0°C, and a minimum temperature in January of -17.0 °C.

Winter (December-February) is mild, and unstable, with a predominance of cloudy weather. Daytime air temperatures are usually positive (3-7°C), and night ones - negative (-9 -14°C). Precipitation most often falls in the form of drizzling rains, sometimes there are snowfalls, but no stable snow cover is formed. Snow lies no more than 15 days. Spring (February-April) is characterized by unstable weather, in which cloudy cool days are replaced by sunny, warm ones. Precipitation falls mainly in the form of short-term showers. The weather in the period from May to September is hot, dry, and largely without precipitation. It should be noted that the maximum soil temperature during this period can reach +68°C. Summer heat combined with very low relative humidity contributes to a dusting of the underlying surface and the transfer of dust and debris, as well as its overheating and spontaneous combustion, which sharply limits the growth of trees and shrubs. Autumn (September-December) is warm, and cloudy, with rains in the second half.

The average annual precipitation is low – 133 mm. The duration of fog, which usually appears in winter, is 64 hours per year.

The average evaporation per year reaches values of 250 mm, above the annual precipitation.

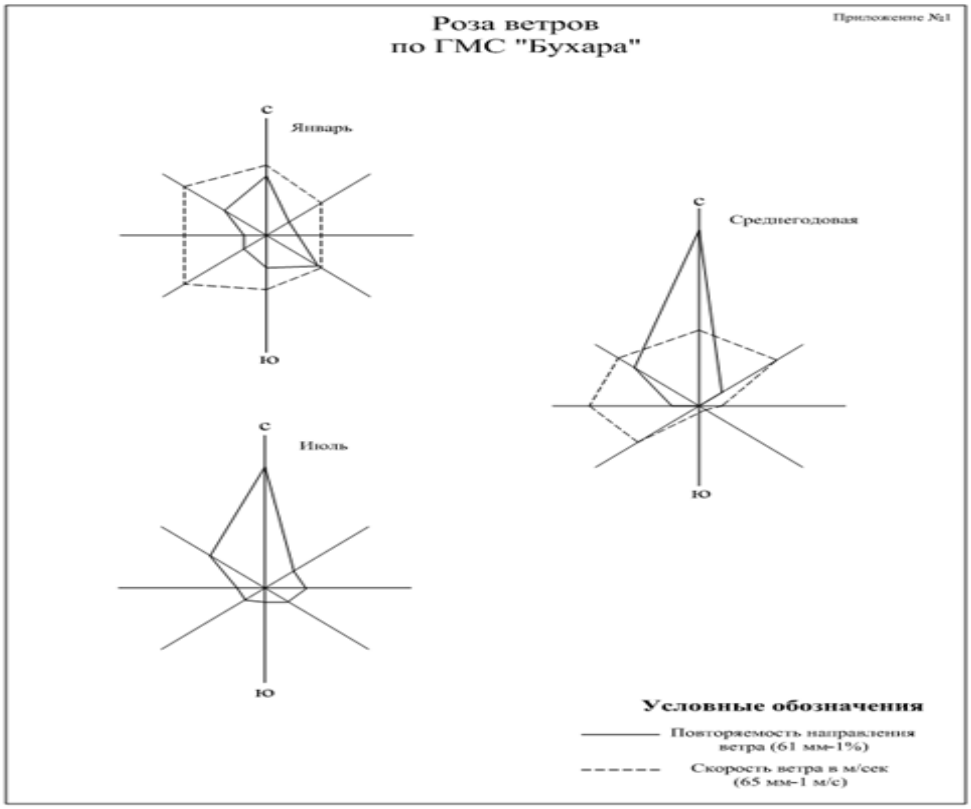
The average annual wind speed is 3.3 m/s. In summer, sand and dust storms are possible. Winds with a speed of 2-3 m/s (31%) and 4-5 m/s (23%) are the most characteristic for this area. Winds with a speed of 4-5 m/s or more are especially dangerous, because they carry harmful substances over long distances.

The predominant wind direction is north and north-west (31%).

Climatic and meteorological characteristics taken as input data for calculating the dispersion of pollutants

Name of indicator	Legend	Measurement unit	Value
Coefficient depending on the atmosphere stratification	A		250
Average air temperature:			
the hottest month	Th	°C	+34,8
the coolest month	Tc	°C	-5
The wind speed, the probability of exceeding which is 5 % per a year	U	m/s	4
Average annual wind speed	Wavg	m/s	3,3

Average annual repeatability of wind directions by points	N	%	31
	NE		6
	E		2
	SE		3
	S		3
	SW		1
	W		23
	NW		31
	no wind		9



1.3 Atmospheric air condition and existing pollution sources

The main sources of atmospheric pollution in the project area are emissions from the industrial and agricultural enterprises.

The emissions of these enterprises contain sulfur dioxide, carbon monoxide, nitrogen dioxide and hydrocarbons.

Motor transport is an impact source to atmospheric air by the combustion products of gasoline and diesel fuel: nitrogen and sulfur dioxides, benzapilene, carbon monoxide and hydrocarbons.

The toxicity of exhaust gases mainly depends on the fuel quality, engine operating and technical conditions and is mainly caused by the content of carbon oxides, nitrogen and hydrocarbons.

The level of atmospheric air pollution in the considered area is acceptable in accordance with the methodological guidelines for ecological and hygienic zoning.

1.4 Ground and soil condition

According to the geomorphological structure, the soils are represented by fine-grained (loam, sandy loam) with a capacity of 3-8 m, under which there is a pebble-sand layer from 20-25 to 40 m. The thickness of overlaying sandy loams and loams has highly compressible properties and is in a water-saturated state from mildly plastic to the current consistency. Dust sands lie in the form of separate low-thick interlayers in the soils of the first layer and a separate thick thickness and medium density of the addition of water-saturated floating (pseudo friable sand).

The soils are non–sedimentary saline and have mainly an increased degree of corrosion activity in relation to steel structures and high to lead and aluminum.

1.5 Groundwater

Groundwater usually lies at a depth of from 0.5-0.8 and up to 20 m. Groundwater in the period of high standing is located at a depth of 0.7 to 1.5 m from the earth surface, and in the period of minimum at a depth of 1.6 to 4.5 m, capillary uplift from 0.5 m to 4.8 m. Groundwater supply occurs due to infiltration of irrigation water, filtration losses of the Zarafshan River and precipitation. Groundwater is highly mineralized, aggressive towards concrete, metal.

1.6 Surface waters

Surface watercourses are represented by the Khayrabad canal and Central Bukhara Canal (the canalized river course of the Zeravshan River in the downstream) in the construction area of sewer networks and wastewater treatment facilities.

1.7 Flora

Trees do not grow in the site area, therefore, cutting down of tree vegetation is not provided. The existing trees and shrubs are completely preserved during the sewer network construction. There is no woody vegetation on the territory where WWTP (wastewater treatment plant) is planned to build. The project implementation will not have a negative impact on the growing world, but on the contrary, the construction of sewer networks and wastewater treatment facilities will prevent the discharge of untreated wastewater to the terrain and open watercourses.

Trees and shrubs cut down, if necessary, for the execution of measures specified in the resolutions and orders of the President and the Government of the Republic of Uzbekistan for the implementation of construction and reconstruction works financed from the state budget, at the expense of loans and grants from foreign and international organizations or investments of international financial institutions, are cut down on the basis of Presidential Decree No. UP-46 dated 30.12.2021 “On measures to accelerate landscaping and further effective organization of tree protection in the republic”.

The flora is represented by a few shrubs in the considered area. A visual inspection of the vegetation revealed a slight foliage dustiness. The foliage of the shrubs is practically not covered with dust. The mouths on the leaf plates are open and not clogged with dust. There was no damage to leaf plates such as black uneven spots in various representatives of shrub plantations. There is also no violation of chlorophyll. All this indicates that the vegetation is in good physiological condition and there are no violations of photosynthetic activity. Outside the area, the leaf condition of these types of foliage of various shrub parts is satisfactory. There are no pale green and yellow-green spots.

1.8 Fauna

The list of representatives of the animal world of the considered area is limited to those species of animals that were able to adapt to life in anthropogenic conditions. There are completely no large mammals characteristic of uninhabited areas. Often there are representatives of rodents - a vole, a house mouse, a grey rat, sometimes there is an eared hedgehog and tortoise.

As for the birds, typically urban representatives live here. These are rook, jackdaw, grey crow, starlings, various types of sparrows, myna, pigeons, etc.

Among insects, it is necessary to name those species that live in the grass – crickets, grasshoppers and others, and among shrubs - mantises, wasps, hornets. Various pests live in the crops of forage grasses – broad-nosed weevil – phytonomus, nodule weevil seed eaters, aphids, alfalfa and field bugs. Fruit trees suffer from peduncles, aphids, coccidae and mites.

In general, it can be stated that the considered area is characterized by the distribution of those species of animals that have been able to find their niche and have adapted to an environment where the dominant place is occupied by a man and his economic activities.

1.9 Socio-economic characteristics of the district

Romitan district (Romitan tumani) is the administrative unit in the Bukhara region of Uzbekistan. The administrative center is the city of Romitan.

There are 18 archaeological, 5 architectural monuments and 4 sights of cultural heritage of Uzbekistan in the district. The most famous of them are: the remains of the ancient settlement of Romitan, the Ali Ramitani and Boboi Samosi mazars and the Charykulbai Bridge.

Romit district was established in 1926. Originally it was called Romit district.

In the cities there are mixed developments: multi-storey, single-storey and individual with private plots. The project cities are landscaped and planted with trees and shrubs.

2. GEOLOGICAL STRUCTURE

Rocks of the Meso-Cenozoic age, lying on the Paleozoic foundation, take part in the geological structure of the district.

The basement rocks were brought to the daytime surface only in the cores of the young Central-Kyzylkum uplifts, to the north of the Gazli epicentral zone, and far enough to the east of the latter, in the uplifts of the western gaols of the Turkestan and Zeravshan systems of the Southern Tien Shan.

The Mesozoic-Cenozoic sedimentary cover on most of the Turanian Plate is formed by Jurassic deposits, and in the deepest depressions rocks of the Triassic and Permo-Triassic are known. However, in many places, various rocks of the Cretaceous, Paleogene and Neogene lie directly on the foundation.

Jurassic sediments are exposed only by deep wells and are represented by limestone, clay, sandstone and conglomerates. Thickness is 150 m.

The Cretaceous deposits are represented by alternating layers of sandstones, clays with layers of siltstones and limestones. The total thickness of the Cretaceous deposits is from 400 to 1200 m.

Paleogene and Neogene deposits are most widespread within the area and are represented by marine formations of the Paleogene and continental deposits of the Neogene.
The undifferentiated stratum of Paleogene-Neogene deposits is everywhere overlain by a little-powerful cover of modern Quaternary thickness. The latter are represented by Aeolian gray fine-grained, dusty sands.
On the territory of the city, they lie mainly in a continuous cover with a thickness of 0.2-4.5 m.
Paleogene-Neogene deposits are represented by an interlayer of sandstones, siltstones and clays.
The sandstones are gray, brown, small, on clay cement, with layers of siltstones and clays with a thickness of 0.3-1.5 m in places with the inclusion of crushed stone up to 10-20% with a high content of gypsum with sandstone layers on carbonate cement. When saturated with water, sandstones melt and turn into quicksand sands.
The research thickness of archival materials is more than 19m. Within the study area, they are distributed everywhere and lie either immediately under Aeolian sands, or in the form of lenses and interlayers in siltstones and clays with a thickness of 0.5 to 10.0 m or more.
Siltstones are gray, light brown and reddish-brown in color, with a shell fracture, dense, fractured, with layers of sandstones, clays and gypsum.
In the upper part of the section, siltstones are weathered, they occur mainly in the form of interlayers and lenses in sandstones and less often in clays in the intervals of 0.5-9.1 m. Their thickness is 0.3-10.0 m.
The clays are gray, light green, thinly layered, sanded, heavily plastered, sometimes with lenses and interlayers of sandstones and siltstones. They lie in depth intervals of 0.4-16.2 m. The uncovered thickness of clays is from 1.0 to 14.0 m. Their roof is a regional reservoir for infiltration waters.

Hydrogeological conditions

In the general complex of Meso-Cenozoic deposits, several aquifers are distinguished.

Basically, these are confined waters with a pressure.

These waters are characterized by high mineralization, the content of dense residue varies from 5.6 to 16.5 g /l and are unusable.

The main aquifer most suitable for use is the Senonian, characterized by better quality compared to the overlying horizons and having good water availability.

The depth of the confining overlying bed varies from 10 m to 100 m. near its exits to the surface at mountain elevations and up to 800 m. in the central part. The specific flow rate of wells varies from 0.1 to 1.3 l/sec. The piezometric level is set at a depth of up to 30 m.

The seasonal regime of underground waters is unsteady, depends on the intensity of their supply by atmospheric and irrigation waters.

The mineralization of groundwater is characterized by the amount of dense residue from 2530 mg/l to 18068 mg/l, the content of sulfate ions from 1008 mg/l to 6817 mg/l, chlorine from 343 mg/l to 4795 mg/l.

Groundwater in the main research area, during the survey period (March 2023), was uncovered at depths of 1.2-4.5 m from the ground surface.

At the calculated minimum, groundwater should be expected to be 1.0 m higher than measured, i.e. at depths of 0.2-3.5 m from the earth surface.

Groundwater, according to Table. 6 and 7 of KMK 2.03.11-96, from non-aggressive to highly aggressive to concretes of normal water resistance (W4) on Portland cement according to GOST 10178-85* and non-aggressive to concretes of the same density on sulfate-resistant cements according to GOST 22266-94, from mildly aggressive to medium aggressive on reinforcement of reinforced concrete structures with periodic wetting.

2.1 Physico-mechanical and chemical properties of soils

In accordance with the lithological structure, genetic and age characteristics, physical and mechanical properties in the studied areas within 5.0 m of the soil thickness, five engineering-geological elements were identified:

EGE-1. Loams and sandy loams (above GWL);
EGE-2. Sandy loams and loams (below GWL);
EGE-3. Sands;
EGE-4. Gravel and sandy cobble.

3. ENGINEERING AND GEOLOGICAL CONDITIONS

In the studied area, the 5.0-meter thickness studied is composed of modern quaternary alluvial deposits of the Amudarya complex (aQIVam).

The amount of dense soil residue is 1330-17780 mg/kg; the content of Cl’ ions is 170-3490 mg/kg; SO_4" ions are 480-10560 mg/kg.

Soils according to the content of easily soluble salts according to the table B 22 of GOST 25100-2020 are estimated as medium saline. According to the content of sulfates for concrete grade W4, water resistance is estimated as from non-aggressive to highly aggressive to concrete on Portland cement according to GOST 10178-85* and from non-aggressive to medium aggressive to concrete on sulfate-resistant cements according to GOST 22266-94 and from non-aggressive to medium aggressive for reinforced concrete structures for dry zone.

EGE-1. Sandy loams and loams (above GWL) - loess-like, brownish-gray and gray in color, macroporous, dusty, from a hard to a refractory consistency with sand layers.

Penetrated thickness is 0.7-3.7 metres.

The subsidence category of the soils is I (first).

Normative values of EGE-1 soils in the studied area are given in Table. 4, their quantitative characteristics are given in the text Appendix 3.

Normative values of the soil characteristics of EGE-1

Table 4

Description of characteristics	Measurement unit	Normative values	Calculated value at α=	
			0,85	0,95
Soil density	t/m^3	1,69	1,66	1,63
Soil density in a dry state	t/m^3	1,44		
Density of soil particles	t/m^3	2,69		
Porosity	b	46,5		
Porosity coefficient	b	0,869		
Natural humidity	fractional unit	0,176		
Degree of humidity	b	0,55		
Humidity at the yield point	fraction	0,262		

	al unit			
Humidity at rolling limit	fraction al unit	0,262		
Index of plasticity	fraction al unit	0,077		
Index of liquidity	b	<0		
Specific cohesion	kPa	13.0	8.0	5.0
Internal friction angle	degree	25	23	22
Modulus of deformation: at natural humidity	MPa	6.5		
at water saturation	MPa	3.0		
Relative subsidence at P= 0,1 MPa 0,2 MPa 0,3 MPa	b	0.010 0.017 0.026		
Initial subsidence pressure	MPa	0.10		

Designed resistance of soils in the natural state R_0=372,5 kPa (3.73 kgf/cm2) and R_0=189 kPa (1.89 kgf/cm2) for water-saturated soils according to table 4 of Appendix 3 of KMK 2.02.01-98.

EGE-2. Sandy loams and loams (below GWL) - loess-like, light-brown and grey in colour, in some places plastered, with interlayers of dusty sand, from fluid-plastic to fluid consistency.

Opened thickness is 1.0-4.4 m.

The soils of this element are watered, not subsident.

Normative values of EGE-2 soil characteristics for the research area are given in Table 5 of the text, their quantitative characteristics are given in the text Appendix 4.

Table 5

Description of characteristics	Meas-urement unit	Norma-tive values	Calculated value at α=	
			0,85	0,95
Soil density	t/m^3	1,93	1,89	1,87
Soil density in a dry state	t/m^3	1,52		
Density of soil particles	t/m^3	2,69		
Porosity	b	43,6		
Porosity coefficient	b	0,774		
Natural humidity	fraction al unit	0,273		
Degree of humidity	b	0,95		
Humidity at the yield point	fraction al unit	0,258		
Humidity at rolling limit	fraction al unit	0,179		
Index of plasticity	fraction al unit	0,079		
Index of liquidity	b	>1.0		
Specific cohesion	kPa	17.0	12.0	7.0
Internal friction angle	degree	25	24	23
at water saturation	MPa	4,5		

The designed resistance R_0 = 197 kPa (1.97 kgf /cm2), Table 3 of KMK 2.02.01-98 Appendix 1.3.

EGE-3. Sands – gray, multi-grained (powdery, fine, gravelly, medium-sized and coarse), water-saturated, with layers of sandy loam, in places with fragments of sandstone, loose and medium-density addition.

Penetrated thickness of 0.3-4.7 m.

The normative values of the soil characteristics of EGE-3 are given in Table 6 of the text and Appendix 5.

Table 6

Normative values of soil characteristics of EGE-3

Description of characteristics	Meas-urement unit	Norma-tive values	Calculated value at α=	
			0,85	0,95
Density of soil particles	t/m^3	2,65		
Soil density	t/m^3	1,92	1,89	1,87
Soil density in a dry state	t/m^3	1,51		
Specific soil gravity	kN/m^3	19,2		
Porosity	%	42,8		

Description of characteristics	Meas-urement unit	Norma-tive values	Calculated value at α=	
			0,85	0,95
Porosity coefficient	b	0,750		
Natural humidity	fraction al unit	0,265		
Degree of humidity	b	0,94		
Internal friction angle	degree	32	30	29
Specific cohesion	kPa	3		
Modulus of deformation	MPa	16,0		
Angle of natural slope: dry; underwater	 degree degree	 31 37		
Filtration coefficient	m/day	10,0		

The calculated resistance for dusty sands is R_0 = 100 kPa (1.0 kgf/cm^2) according to table 2 of KMK 2.02.01-98 Appendix 3.

EGE-4. Gravel-pebble soils – includes gravel-pebble soils represented by fragments of sedimentary and metamorphic rocks with sandy-clay filling, water saturation. The pebbles are well-rounded consisting of igneous and sedimentary rocks.

IGE-4 soils underlie all the above-described soils. The IGE-4 roof in the study area is opened at depths from 3.0 to 4.5 m.

With an open thickness of 0.5-2.0 m

The IGE-4 soils are not subsident.

The normative values of the soil characteristics of IGE-4 are given in Table 7 of the text and Appendix 6.

Table 7

Normative values of the characteristics of EGE-4 soils

Description of characteristics	**Meas-ure-ment unit**	**Norma-tive values**	**Calculated value at α=**	
			0,85	**0,95**
Density of soil particles	t/m^3	1.95		
Specific cohesion	kPa	0		
Internal friction angle	degree	38		
Modulus of deformation	MPa	50		
Soil conversion factor		1.25		
Filtration coefficient	m/day	20-50		
The characteristics of pebble soils are given according to the “Bulletin of technical information of UzGIITI No. 34”.				

Design resistance R_0 = 600.0 kPa (6.0 kgf/cm^2).

CONCLUSIONS AND RECOMMENDATIONS

The basis of the designed route will be the soils of engineering-geological elements of EGE-1, EGE-2, EGE-3 and EGE-4, the normative and calculated values of physical, strength and deformation characteristics of which are given in Tables 4, 5, 6 and 7 of the text and Appendixes 3, 4, 5, 6 and 7.

EGE-1. Sandy loam and loams (above GWL);
EGE-2. Sandy loam and loams (below GWL);
EGE-3. Sand;
EGE-4. Gravel-pebble soils.

EGE-1. Sandy loam and loams (above GWL) are loess-like, brownish-gray and gray in color, macroporous, silty, from a hard to a refractory consistency with layers of sand.

Penetrated thickness is 0.7-3.7 m.

The initial subsiding pressure is 0.10 MPa.

The type of ground conditions for subsidence is I (first).

EGE-2. **Sandy loam and loams (below GWL)** are loess-like, brownish-gray and gray in color, dusty, with layers of multi-grained sand, from fluid-plastic to fluid consistency.

Penetrated thickness is 1.0-4.4 m.

The soils of this element are watered, not subsident.

EGE-3. Sands are gray, multi–grained (powdery, fine, gravelly and medium-sized and coarse), water-saturated, with layers of sandy loam, in places with fragments of sandstone, loose and medium-density addition.

EGE-4. Gravel-pebble soils includes gravel-pebble soils represented by fragments of sedimentary and metamorphic rocks with sandy-clay aggregate, water saturation. The pebbles are well-rounded consisting of igneous and sedimentary rocks.

IGE-4 soils underlie all the above-described soils. The IGE-4 roof in the study area is opened at depths from 3.0 to 4.5 m.

With an open thickness of 0.5-2.0 m

The IGE-4 soils are not subsident.

Soils according to the content of easily soluble salts, according to the table B 22 of GOST 25100-2020 are estimated as medium saline. According to the content of sulfates for concrete W4 grade, water resistance is estimated as from non-aggressive to highly aggressive to concrete on Portland cement according to GOST 10178-85* and from non-aggressive to medium aggressive to concrete on sulfate-resistant cements according to GOST 22266-94 and from non-aggressive to medium aggressive for reinforced concrete structures for the dry zone.

Groundwater during the survey period (March 2023) was uncovered at depths of 1.2-4.5 m from the earth surface.

Groundwater, according to Table 6 and 7 of KMK2.03.11-96 from non-aggressive to highly aggressive to concretes of normal water resistance (W4) on Portland cement according to GOST 10178-85* and non-aggressive to concretes of the same density on sulfate-resistant cements according to GOST 22266-94, from mildly aggressive to medium aggressive on reinforcement of reinforced concrete structures with periodic wetting.

Dangerous geological processes – seismicity, possibly flooding, aggressiveness of soils and water.

The seismicity of the area according to Amendment 1 to KMK 2.01.03-19 for the Romitan city is 7 (seven) points with a repeatability of 1 every 50 years.

The category of soils by seismic properties is III (third).

The maximum depth of soil freezing according to Table 13 of KMK 2.01.01-94, consists of 45 cm – possible once every 10 years; 57 cm – possible once every 50 years (according to Navoi m/s).

Soils according to the method of excavation by mechanisms (based on their density), according to the additions and amendments to the technical part of the SHNK 4.02.01-04 (Table 1-1a), correspond to the points and groups:

Bulk soils - item 26, with a soil density of 1800 kg/m^3;

Soil-vegetation layer - item 9, with a soil density of 1200 kg/m^3;

EGE-1. Loam and sandy loam (above GWL) item 35, item 36, with a density of 1640 kg/m^3;

EGE-2. Sandy loams and loams (below GWL) item 36, item 35 with a density of 1930 kg/m^3;

EGE-3. Sands, item 29, with a density of 1920 kg/m^3;

EGE-4. Pebble gravels, item 6, with a density of 1950 kg/m^3;

Establishment of a Sanitary Protection Zone (SPZ).

A sanitary protection zone (SPZ) is a special territory with a particular arrangement of use, which is established around facilities and industries that are sources of impact on the environment and human health. The size of the SPZ ensures the reduction of the pollution impact on the atmospheric air (chemical, biological, physical) to the values established by hygienic standards.

By its functional purpose, the sanitary protection zone is a protective barrier that ensures the safety level of the population during the operation of the facility in normal regime. The impact sources on the habitat and human health are objects for which the levels of pollution generated outside the industrial site exceed 0.1 ELV and/or AEL.

The SPZ boundaries are established in accordance with Sanitary norms, rules and hygienic standards of the Republic of Uzbekistan SanPiN RUz No. 0350-17 “Sanitary norms and rules for the protection of atmospheric air in populated areas of the Republic of Uzbekistan”. The planned capacity of WWTP after reconstruction and modernization will be 5,045 thousand m^3/day. In accordance with the requirements of SanPiN No. 0350-17 “Sanitary norms and rules for the protection of atmospheric air in populated areas of the Republic of Uzbekistan” for wastewater treatment plants with a capacity of up to 5 thousand m^3 per day (Table 6.5.1), the size of the SPZ is 200 m.

The nearest residential buildings of the Romitan district centre are located more

than 600 m from the west side of the planned WWTP territory, which meets the requirements of San PiN RUz No. 0350-17. The Minutes of the public hearings are attached. (Appendix No. 2)



4. DESCRIPTION OF THE OBJECTIVES, NATURE, MEANS AND TIMING OF CONSTRUCTION

This section considers the issue of the development and modernization of sewerage systems and wastewater treatment facilities located on the territory of the Romitan district centre of the Bukhara region. The construction period will make up 12 months.

ToR design materials on the planned structure of residential development, the estimated population of the city, and data on the planned objects of social culture and industry were used as initial data for the construction of WWTP.

№	Physical scopes	Romitan
1	Construction of WWTP	5045 m^3/day
2	Construction of sewer network	102 264 m
3	Construction of pumping stations	14 pcs
4	Operation and maintenance equipment	8 units

Sewer network. The designed sewerage system of the city is not fully separate. This sewerage system provides for a scheme of sewer collectors, networks and pumping stations for the disposal of domestic wastewater, and contaminated industrial water allowed to descend into domestic sewage, from sewage objects to sewage treatment facilities. Conditionally pure industrial water is not accepted into the city's sewage system, and after local treatment is used for watering the territory, washing cars and water supply circulating. Atmospheric precipitation is drained through the irrigation network.

Route and calculation of the sewer network were carried out taking into account the carrying capacity of sewer collectors, terrain, distribution of the population and industrial enterprises on the territory of the city. The sewer gravity network is provided from pipes d = 200-600 mm, and the pressure network from pipes d = 200-300 mm. The designed sewer collectors are made of non-metallic sewer pipes that are not subject to corrosion and have a long service life. Along the collector route, manholes for inspection and cleaning are provided for installation, made of precast or mono-cast reinforced concrete. The depth of the network laying is 1.8-4.5 m. Pipes are laid on an artificial base with water reduction at the sites of laying in water-saturated soils. Pipeline crossings over water barriers, automobile roads and railway tracks should be provided in casings.

When solving the sewerage scheme, the new city boundary, relief conditions, the order of development, as well as previously completed studies were taken into account.

The territory relief of the district centres is flat with a slight decrease in some areas by 1,0 -2,0 m in relation to the general relief. It is planned to zone the territory with gravity sewage basins with local pumping stations (SPS) or Lifting Sewage Pumping Stations (LSPS) from the condition of the depth of the supply network to the SPS 4.5-5 m.

Sewer lines will be laid on the road border of the street side, i.e. basically will not affect the roadbed.

The width of the trench will be 0.65 meters. When removing the soil, another 2.0-2.5 meters of territory will be temporarily occupied for moving equipment.

The pipes will be laid with an open method. Its main shortcomings are the

destruction of road pavements, the disturbance of the landscape with the subsequent need for their restoration, and the disruption of the activities of objects in the construction zone and traffic on highways.

The open method of network assembly is performed by digging trenches to the required depth, preparing and strengthening trenches, and laying pipes. The parameters of the trench for the polyethylene pipe will be as follows:

- width 0.655 m
- depth from 1.8 to 4.5 m
- average depth 3.15 m
- length 102 264 m.

After completion of the main earthworks, the pipeline laying will be laid including the following actions:

- levelling the trench bottom;
- filling of a pillow for a pipeline made of sand;
- pipe laying;
- trench filling;
- reinstatement of road and landscaping.

Levelling the bottom of the trench involves the creation of a mandatory slope. The longitudinal profile of the trench should have a minimum slope of 4mm/m. Such a slope will minimize the presence of air in the pipe and the formation of an air “plug”.

The filling of the lower “pillow” is made of sand of a fraction of 0-5mm. At the same time, the layer thickness is 0.1 m.

There is a developed gravel road network in the construction area, as well as field roads that can be used during construction.

The local network of the district will be used for the power supply of the construction. The existing irrigation network will be used for technical water supply, and the water supply network in settlements will be used for household needs.

Working hours will be 8 hours a day (one shift). 20 people will be involved in the construction. The estimated quantity of equipment for the entire construction period will be 8 units. Cranes, excavators, dump trucks, and front loaders will be placed on the construction site. The equipment used in the construction of the sewer pipeline will belong to contractors.

The following types of equipment will be used during the entire construction period:

Name	Q-ty
Excavator	1 unit
Truck crane	1 unit
Emergency service vehicle	1 unit
Dump truck	1 unit
Bus	1 unit
Mobile compressor	1 unit
Passenger car	1 unit
Cesspool truck	1 unit
Equipment for welding PVC pipes	2 units

At different stages of construction, different amounts and types of equipment will be used. The equipment will work on 3 sites: at the beginning, middle and end of the site. All the equipment will work alternately performing its functions. It is expected that each type of equipment will work periodically, no more than a month on one site.

Refuelling and maintenance of equipment will be carried out on the territory of contracting organizations.

Workers, temporary buildings and structures.

The calculation of the need for construction personnel is made from the standards of the planned output of one worker during construction and installation works in accordance with the calendar construction schedule. The maximum number of workers is determined from the maximum costs in the busiest quarter. The provision of construction with working personnel is provided at the expense of the involved organizations (concrete workers, installers).

Timely buildings and structures.

The production base of the general contractor is mainly used for the construction of structures. The placement of temporary buildings, structures and roads, communication means is carried out directly by the construction organization.

Basic data of hydraulic calculation. During the development of the hydraulic calculation of the sewer network, the pipeline diameters and slopes were determined, ensuring the passage of estimated wastewater flow rates with the required velocity and degree of pipe filling. The calculation is made based on the condition of a timely and complete accounting of estimated wastewater costs with minimal construction and operational costs.

1. In order to prevent clogging and make it easier to eliminate it quickly, minimum pipe diameters are set: for domestic wastewater networks - 150 mm;

2. The calculated filling (h/d) is taken depending on the pipe diameter: no more than 0.6 within d = 150-300 mm; no more than 0.7 within d= 350-450 mm; no more than 0.75 within d= 500- 900 mm.

3. At the calculated pipe filling of the household sewer network, the self-cleaning rates are: 0.7 m/s in pipes d= 150-250 mm, 0.8 m/s in pipes d= 300- 400 mm; 0.9 m/s in pipes d= 450-500 mm; 0.95 m/s in pipes d= 600-800mm. The maximum design velocities of wastewater motion on non-metallic pipes - 4 m/s.

Hydraulic calculation of the pressure network sections is reduced to the determination of pipe diameters and pressure losses when wastewater flows through them. The calculation is made according to the same tables as for the calculation of gravity sewer networks, taking into account the complete filling of pipes.

Norms are allowed to reduce the minimum laying depth of the pipe tray: d = 500 mm by 0.3, and d = 500 mm by 0.5 less than the greatest freezing depth in the sewer construction area.

To protect pipes from mechanical damage by land transport, the laying depth of the pipe top is adopted at least 0.7 m, the slope from the household to the sewer network is adopted 0.02 and the diameter is 110 mm. The length of the house connections is adopted 30 m. The minimum manhole depth up to the tray is 1.3 m.

The minimum value is assumed to be 0.7 m to ensure the wastewater collection from sanitary appliances of the first floor.

The deepest laying depth of gravity sewer networks is taken in water-saturated rocks of the Bukhara region - up to 4,5 m.

Pumping stations are provided for lifting wastewater into the upstream section of the network.

Manholes for various purposes are arranged on the sewer network.

Inspection manholes are installed at all points of change in the direction of the network (bending), points of pipe connection to each other (nodal), on straight sections after 50 m with a pipe diameter from 150 to 600 mm, as well as at all sections of change in slopes and pipe diameters. They are installed from precast reinforced concrete elements. Open trays are arranged inside the manhole at its base.

The drop manholes are arranged on alignment with large slopes to ensure an unacceptable velocity of wastewater motion in the pipes.

Duckers are arranged at the crossings of the sewer network with rivers, canals and ravines. The ducker consists of inlet and outlet chambers and pressure pipelines connecting these chambers and passing through a river, canal, ravine.

The smallest diameter of the pressure pipelines of the ducker is 150 mm, and their number at the crossing of rivers is at least two. The calculated velocities of wastewater motion in the duckers are accepted at least 0.9 m/s.

Sewage pumping stations located on the sewerage territory are placed at a distance of at least 20-30 m from residential and public buildings. Their locations are selected depending on the sanitary, hydrometeorological and topographic conditions of the area. In case of an accident, emergency releases are arranged in front of the pumping station to discharge wastewater into a reservoir (drainage).

Lifting Sewage Pumping Stations LSPS and SPS. Sewage pumping stations are used for pumping sewage liquid on networks. According to the purpose, there are main pumping stations, district pumping stations and lifting pumping stations. The task of the main pumping station is to supply wastewater from the main collector to the treatment facilities. District pumping stations are designed to pump wastewater from one sewerage area (basin) to the collector of another or to the main collector of a settlement.

Lifting pumping stations are arranged on sewer networks if it is necessary to raise water from the marks of the maximum possible laying of pipelines with an open method of work into collectors with less depth.

Performance and pressure of LSPS and SPS

Name	Performance of SPS, l/sec	Head, m	Number of pumps, pc (duty, standby)	Capacity of impeller, kW
SPS 1	9,60	6,00	1/1	2,2
SPS 2	55,90	5,00	1/1	9
SPS 3	96,35	6,00	1/1	16
SPS 4	13,34	5,00	1/1	2,2
SPS 5	5,57	7,15	1/1	2,2
SPS 6	4,72	5,10	1/1	1,8
SPS 7	3,01	5,00	1/1	1,8
SPS 8	3,73	6,00	1/1	1,8
SPS 9	1,14	6,00	1/1	1,6
SPS 10	1,68	5,00	1/1	1,6

SPS 11	4,54	6,30	1/1	2,2
SPS 12	3,28	6,50	1/1	2,2
SPS 13	2,37	5,00	1/1	2,2
SPS 14	7,87	5,20	1/1	2,2

Description of pumping equipment. Depending on the performance, pumps with a chopper and without a chopper are accepted.

Fecal pumps are submersible types. The body of such devices is made of cast iron. The design features of this equipment allow it to be operated in conditions of heavy pollution. Uninterrupted operation and durability are achieved due to the following mechanisms: a chopper made of alloy-hardened steel; an inlet filter made of a strong mesh that cuts off particles that do not pass through the pipeline and is not crushed by the cutting mechanism; adjustment of the impeller position; shaft seal; overheating protection, when a critical point is reached, sensors turn off the device.

The design of the pumps provides a cutting mechanism that grinds solid particles to such a size that they pass through a pressure pipeline of a relatively small diameter.



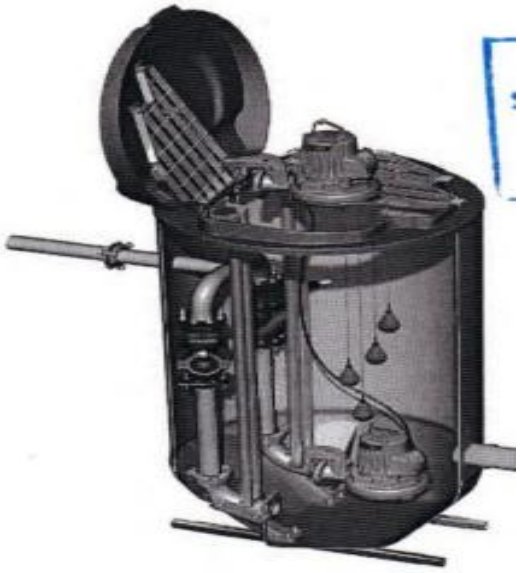
Automatic operation of pumps. Pumps shall have a built-in control system, sensors and motor protection:

- built-in level control sensor and dry running sensors;
- built-in motor protection;
- alternation of pumps;
- alarm output;
- if the phase sequence is incorrect, the pump will not turn on;
- self-calibration after each pumping cycle;
- jamming protection;
- delayed start;
- automatic phase sequence detection (three-phase power supply);
- starter to provide additional starting torque (single-phase power supply);
- shutdown delay function (foam pumping).

If several pumps are installed in one tank, the control circuit built into the pump will ensure uniform load distribution across all pumps; there is an emergency relay output in the pump. Normally closed (NC) and normally open (N0) contacts are used when

necessary, for example, to give an audible or visual alarm signal. The data transmission device provides data exchange via open and compatible networks, GSM/GPRS (wireless), or using the GRM remote control. The anti-jamming function starts the pump at programmatically set intervals to prevent the impeller from jamming. This function rejects the dry-running sensor readings in non-explosion-proof versions.

SPS construction part



Monolithic polyethylene tank with a lid, pipelines, shut-off valves, and accessories for mounting pumps. The supply pipe can be embedded in the tank at any level acceptable for normal operation of the station.

The station body is made of polyethylene with a diameter from 400 to 1400 mm, height up to 6000 mm. The set of delivery includes pumps, control cabinet, fittings, pressure pipelines, level switches, lifting chains, ventilation pipeline, and cuffs for the supply pipeline. The inlet pipe can be embedded into the tank at any level acceptable for normal operation of the station.

The pumping station is a sealed tank with a fecal pump. One is a duty, and the second is a standby, which is needed to maintain the SPS in working condition in case of failure of the main one. When the wastewaters reach a certain point, the system turns on, wastewaters are pumped out.

WASTEWATER TREATMENT PLANT (WWTP)

Wastewater consumption

Calculations have been made for the following wastewater consumption accepted for 2045

List for 2045			Romitan
Focast population			28 000
Daily consumption	m^3/day (average)	MAX	5045,0
		Average	4586,4
Hourly consumption	m^3/h	MAX	346,8
		Average	210,2
Instantaneous Consumption	l/s	MAX	96,3
		Average	58,39
Daily uneven factor			1,1
General coefficient			1,7

The wastewater quality entering the treatment facilities

For the selection of wastewater treatment methods and facilities, the main indicators are: concentration of suspended solids, BOD, COD, permanganate oxidizability, PH of the medium, wastewater temperature, the presence of surfactants (SAA), the content of biogenic elements - nitrogen, phosphorus, etc.

The degree of contamination of domestic wastewater is determined by the amount of pollutants introduced by one person into wastewater when using sanitary appliances. For domestic wastewater, the following amount of pollutants per inhabitant, g/day has been established

The number of pollutants introduced by one person

suspended substances, total	65
including settling	40
BOD_5 of unclarified liquid	54
BOD_5 of clarified liquid	35
BODfull of unclarified liquid	75
BODfull of clarified liquid	40
Nitrogen of ammonium salts	8
Phosphates, total	3,3
including from detergents	1,6
Chlorides	9
Surface acting agent (SAA)	2,5

TECHNOLOGICAL WASTEWATER TREATMENT SCHEME

The scheme of treatment plants is very complex and includes various wastewater treatment stages.

The WWTP treatment scheme includes the following main stages: mechanical, biological treatment (this is a traditional technology with activated sludge, biological removal of nutrients), improved tertiary post-treatment (chemical settlement and filtration), and disinfection.

It is characteristic that the facilities are arranged in a certain sequence for wastewater treatment. Such a complex is called a treatment plant line.

Mechanical treatment

The scheme starts with mechanical treatment. Screens and grits are most often used here. This is the initial stage of the entire water treatment process. Paper, rags, cotton wool, bags and other garbage can be there. The grits come into operation after the coarse and fine screens. They are necessary in order to retain sand, including large sizes.

Initially, all wastewaters enter the main pumping station in a special tank. This tank is designed to compensate for the increased load during peak hours. A powerful pump evenly boosts the appropriate volume of water to pass through all treatment stages.

Then the water enters the mechanical treatment section. Up to 75% of pollution is eliminated at this stage. There are several units for removing large debris and insoluble impurities:

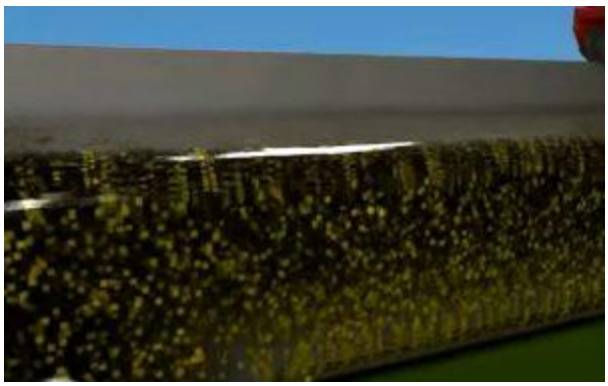
Screens catch large debris of more than 16 mm – cans, bottles, rags, bags, food, plastic, etc. In the future, this garbage is taken to the places of processing of solid household and industrial waste. Screens are a kind of cross metal beams, the distance between which is equal to several centimeters.





Grits. The wastewater treated from small inclusions enter the designed three-section horizontal aerated grit, where wastewater is treated from sand and fatty inclusions. In fact, they catch not only sand but also small stones, glass fragments, slag, etc. The sand settles to the bottom pretty quickly under the gravity influence.

The air supply to the aeration system of the grit is carried out by blowers located in the grit building. The settled particles are raked by a special device into a recess at the bottom, from where it is pumped out by a pump. The removal of the trapped sand into the pit of each grit section is carried out by hydraulic washing. The sand pulp is removed from each pit by pumps and sent to sand separators (located in the grit building) designed for processing sand pulp and separation of mineral and organic parts. The sand is washed and disposed of.



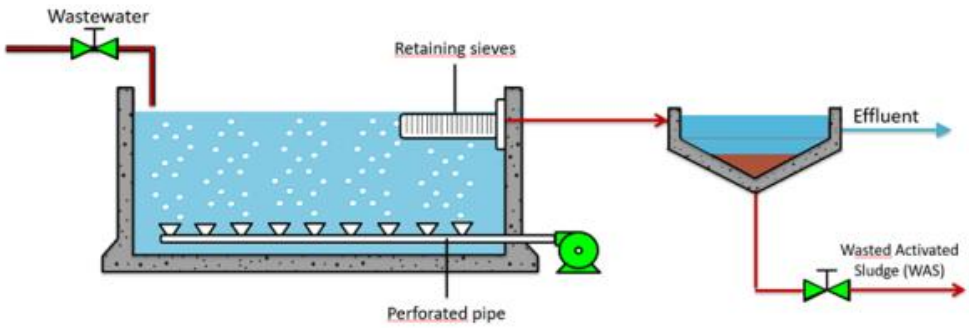
After the removal of large and small mechanical impurities from the wastewater, the wastewater is sent to the **primary sedimentation tank**, which is an important element of any line of treatment facilities. Primary radial sedimentation tanks are designed to separate the suspended part of pollutants (including from helminth eggs) by settling. Sedimentation tanks are large tanks of round or straight-carbon shape, where substances are deposited under the influence of gravity. To speed up this process, special additives are used – coagulants or flocculants. They contribute to the adhesion of small particles due to changes in charge, larger substances are deposited faster. The principle of operation is based on the fact that water flows from one end of the unit, while the pipe diameter at the outlet becomes larger and the fluid flow slows down. All this contributes to the deposition of particles. The falling-out dock with the help of a scraper mechanism installed on a movable farm is shifted into the sludge pit of the settling tank. The sediment is removed through a pipeline to a nearby pumping station from where it is pumped by a centrifugal pump into a silt sealer. Clarified wastewater from primary sedimentation tanks in the gravity mode is supplied for biological treatment in aeration tanks.

Biological treatment. Biological treatment is an important stage in the multistage system of large urban treatment complexes. The essence of biological treatment is to remove various pollutants from the wastewater (organic matter, nitrogen, phosphorus, etc.) with the help of special microorganisms (bacteria and protozoa). These microorganisms feed on harmful pollutants contained in the wastewater, thereby treating it. From a technical point of view, biological treatment is carried out in several stages - an aerotank and a secondary sedimentation tank.

An aerotank is a tank where water after mechanical treatment is mixed with activated sludge (special microorganisms), which treats it. The aeration tank displacer assumes that there is no mixing of the incoming flow with the previously received one, and each new volume moves along the reactor axis (aeration tank) without contacting neighboring volumes. The aerotank is divided into two zones: anoxic zone (denitrification) and aerobic zone (nitrification).

An activated sludge treatment process usually includes three basic components: (1) a reactor in which microorganisms responsible for treatment are kept in suspension and aerated (aerotank), (2) liquid-solids separation unit and suspended solids (clarifier/ Final Settlement Tank) and (3) a recycle stream for return activated sludge removed on

stage 2 containing active microorganisms back into the process – also known as the returned activated sludge (RAS). To avoid accumulation of microorganisms within the system, the recycle stream is split and the surplus sludge is wasted, often referred to as the surplus activated sludge (SAS)/ wasted activated sludge (WAS). The SAS/WAS is periodically removed from the system and thickened in a dedicated sludge treatment line. An illustration of a typical CAS process is presented below.



Secondary sedimentation tanks. Here the wastewater is treated from the active sludge by settling it. Microorganisms settle to the bottom, where they are transported to the sump by an attached scraper. The activated sludge, which continuously settles at the bottom of the tank, enters the projected sewage pumping station of excess sludge and is fed back to the aeration tanks. Activated sludge formed during wastewater treatment is discharged into the silt compactor. A surface scraper mechanism is provided to remove the floating sludge. Biologically wastewater after the post-treatment unit for suspended solids is supplied for disinfection.

Wastewater decontamination (disinfection). After biological treatment, the content of harmful bacteria in the wastewater is significantly reduced. Conducting wastewater treatment procedures at artificial wastewater treatment plants, such as aerotanks and biofilters, allows 95% of all dangerous microorganisms to be removed from wastewater. But even the content of 5% of harmful microorganisms in wastewater is a lot, and it is dangerous for human health. And only decontamination procedures allow to completely treat the effluents from them. The main disinfection method of wastewater is **chlorination**.

Chlorine is introduced into wastewater that has undergone biological treatment. It is necessary to observe the dosage of chlorine injected into a certain volume of wastewater. This indicator is called the chlorine dose and is measured in g/m3. That is, it shows how many grams of active chlorine must be added to each cubic meter of wastewater. The dose of chlorine varies depending on the previous method of wastewater treatment and is: 10 g/m3 – if the effluents have undergone only mechanical treatment; 5 g/m3 - if the wastewater has undergone incomplete artificial biological treatment; 3 g/m3 – if the wastewater has undergone complete artificial biological treatment. In the process of adding active chlorine to wastewater, it should be thoroughly

dissolved. It takes about 30 minutes for chlorine to disinfect the drains. The treated and disinfected wastewater is discharged into the collector.

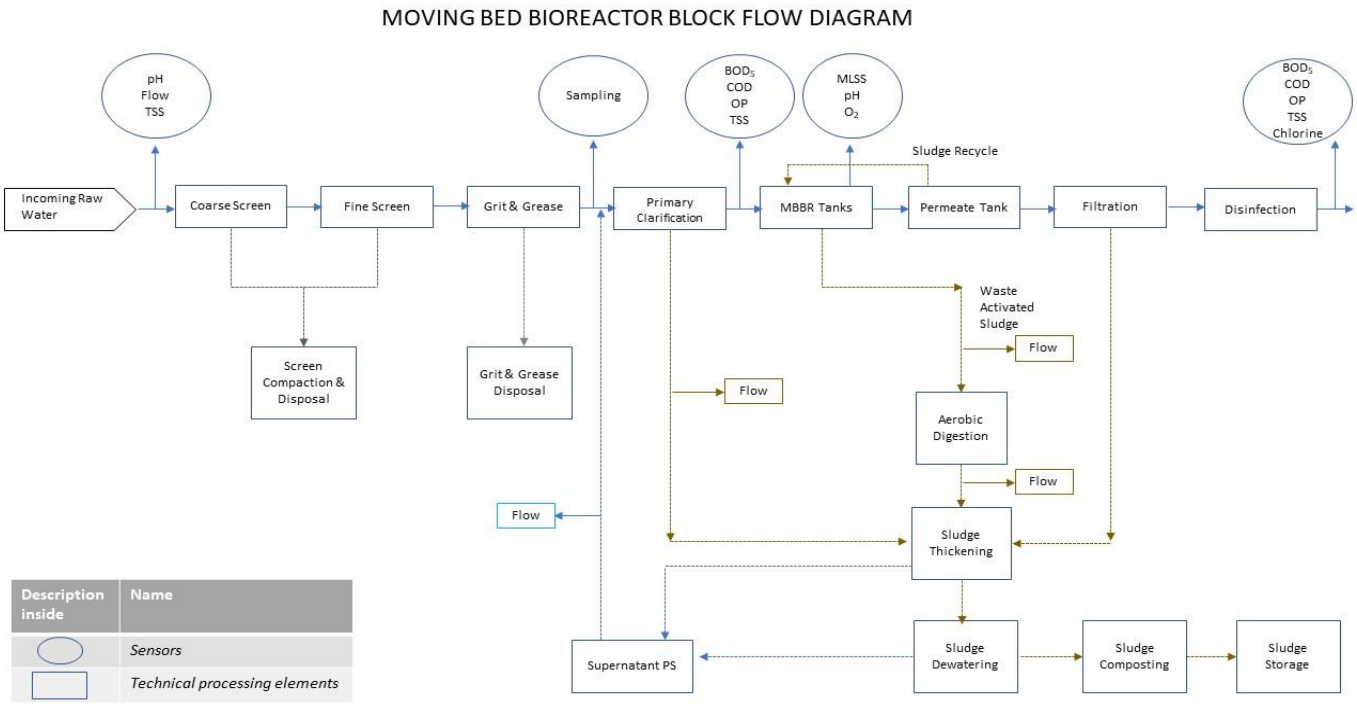
Sludge treatment. Sludge treatment is an important component of the municipal wastewater treatment system.

Wastewater sludge is a complex multicomponent system consisting of organic and mineral parts. Urban wastewater sediments contain a large number of microorganisms, including pathogenic, toxic compounds, especially heavy metal ions, in concentrations significantly exceeding the ELV of metals in the soil. According to the Manual "Urban Wastewater Sludge Treatment" of the Ministry of Education and Science of the RSFSR (2016), the volume of wet cake generated at wastewater treatment plants is from 0.5 to 10% of the volume of wastewater depending on the technological treatment scheme. The quality of wastewater sludge mainly depends on the sewerage standard, development and nature of the industry, efficiency of local treatment facilities of enterprises, composition of urban treatment facilities.

Wastewater sludge is an aqueous suspension of mineral and organic substances of various compositions and origin, released from wastewater during their mechanical, biological or physico-chemical treatment (reagent) with a volume concentration of polydisperse solid phase from 0.5 to 10%.

The sludge temperature is 12–200 C°, and the active medium reaction (indicator pH) is the same as wastewater, ranging from 6 to 8.

For the sludge disposal, experts have proposed a composting method, since this method is optimal, safe and feasible in Uzbekistan. This method will also make it possible to effectively use the area allocated for the placement of WWTP. Method of sludge composting technology. As it is known, when a biological reaction occurs in the compost, the compost temperature heats up. For further normal compost maturation, it is necessary to cool the compost, enrich it with oxygen and mix. Vortex is required for this purpose. Composting is the most economical and ecological method of sludge processing, then after composting this mass is used as fertilizer on the upper fertile soil layer.



Type of WWTP sludge

Type of sludge	Facilities and equipment holding sediments	Granulometric composition, % from the mass of the dry matter of the sediment
Coarse sediments (wastes)	Screens	Particles with a size of more than 10 mm – 93%, less than 10 mm – 7%
Heavy sediments	Grit	Particles with a size of 0,5–3 mm
Floating sediments	Sedimentation tanks	-
Raw sediments from wastewater as a result of mechanical treatment	Primary sedimentation tanks	Particles with a size of more than 7–10 mm –5–20%, 1 –7 – 9–33%, less than 1 mm – 50–88%
Activated sludge	Secondary sedimentation tanks	Particles with a size of less than 1 mm – 98%, 1–3 – 1,5–1,8%, more than 3 mm – 0,4–0,6%
Digested sludge	Anaerobic Digestion Tanks	Particles with a size of less than 1 mm – 85%, more than 1 mm – 15%

Sludge thickening condensated to humidity of 90-98%	Sludge densifier	Particles with a size of less: 0,15 mm – 90%, 0,15–1 mm – 10%
Dewatered sludge	Sludge beds	-

Sediments disposal

Coarse sediments (waste from the screens) are trapped by screens. Trapped waste particles consist of large suspended and floating substances, mainly of organic origin: containing paper - 68.5%, rags - 26.6%, wood, straw - 2.0%, kitchen waste - 2.7%, bones - 0.3%. The amount of waste from screens with an opening of 16 mm is 8 l/person a year - with a moisture content of 80% and a volumetric weight of 750 kg/m^3.

Waste from the mechanical screens installed in the new screening building is transported to a waste dewatering press and then discharged into garbage containers. Garbage is removed from garbage containers as solid domestic waste.

Grit removal

Heavy sediments are trapped by grit chambers. They include sand, fragments of minerals, bricks, cinders, broken glass, etc. The volume of retained sand is 0.02–0.03 l/person per day, the volumetric weight is 1.5 t/m^3, the humidity is 60%.

Grit from the horizontal aerated grit chambers is pumped into the grit classifier for dewatering by means of submersible pumps. The grit is fed to the classifier into the funnel for sedimentation, where the particles settle. The slowly rotating spiral conveyor improves sedimentation, transports and discharges the separated sand. The filtrate is discharged from the surface of the funnel. The dehydrated sand is discharged into a sealed container, the filtrate is discharged into the wastewater channel in front of the screens. Sand is transported to the solid waste landfill.

Sediments floating in sedimentation tanks. Quantity of 2 l/person per year with a moisture content of 60% and a volume weight of 0.6 t/m^3. The fat fraction retained in the aerated grit chamber is removed and, as it accumulates and is fed for composting.

Raw sludge from primary sedimentation tanks

Raw sediments are retained by primary sedimentation tanks. In domestic wastewater, these sludges are a gelatinous, viscous suspension with a sour odor that has not yet lost its structure. Organic matter in them makes up 75-80% and quickly rots, emitting an unpleasant odor. The moisture content of the sludge during gravity removal after a 2-hour settling is 95–96%, and when removed from the sedimentation tank by plunger pumps – 94–95%. The mechanical composition of sediments from primary sedimentation tanks is very heterogeneous. The size of individual particles ranges from 10 mm or more to particles of colloidal and molecular dispersion.

Waste activated sludge

At the biological wastewater treatment stage, waste sludge is formed, as microorganisms in aeration tanks actively multiply.

Activated sludge retained by secondary sedimentation tanks after aeration tanks

is a biocenosis of microorganisms and protozoa, and has the property of flocculation. The structure of activated sludge is a flaky mass of brown color. When fresh, activated sludge is almost odorless or smells like earth, but, rotting, emits a specific putrid odor. In terms of mechanical composition, activated sludge belongs to thin suspensions and consists of 98% by weight of particles smaller than 1 mm. The moisture content of activated sludge discharged from secondary sedimentation tanks after the aeration tank is 99.2–99.6%, after biofilters – 96–96.5%. Activated sludge compacted in vertical sludge compactors has an average moisture content of 98%, radial type compactors-97%, flotation compactors - from 96 to 97%, thermogravity compactors - from 95 to 96%, other special compactors - up to 90%.

Waste sludge is dewatered and disposed of.

The dewatering process takes place in several stages:

- special reagents are added to the waste sludge, which stop the activity of microorganisms and contribute to their thickening.
- In the sludge compactor, the sludge is compacted and partially dewatered.
- Sludge is squeezed out in a centrifuge and residual moisture is removed from it.
- In-line dehumidifiers use continuous circulation of warm air to finally dry the sludge.
- Water removed from the sludge is returned back to the beginning of the treatment cycle.

So, in the wastewater treatment process at sewage treatment plants, the main waste generated are:

- waste from the screens;
- sediment from grit chambers and fat fraction from grit chambers;
- raw sludge from primary sedimentation tanks;
- waste activated sludge from secondary sedimentation tanks.

CONDITIONS FOR THE WASTEWATER DISCHARGE FROM THE WWTP INTO THE COLLECTOR

The effluents discharge from the WWTP will be carried out into the Central Bukhara collector, which flows at a distance of 100 meters.

Adjustment of the volume of treated wastewater discharge will be carried out after determining all the characteristics of the equipment of the reconstructed sites before putting the WWTP into operation, when developing standards for emission limit values, as part of the Environmental Impact Consequences Statement (EICS).

ELV standards are established by calculation or according to design data based on an analysis of the water and material balance of the organization, taking into account the composition of the source water and the components used in the technology used, taking into account background concentrations.

In all cases, the ELV is set not higher than the level of background quality of

natural water used for wastewater discharge, and not lower than the maximum permissible concentrations established for surface water bodies of fishery and (or) cultural and domestic significance.

The discharge of wastewater from WWTP must comply with the requirements of SanPiN RUz No. 0318-15 "Hygienic and anti-epidemic requirements for the protection of water bodies in the territory of the Republic of Uzbekistan", and must also be carried out in such a way that, as a result of discharge, the water of the surface watercourse - the receiver of wastewater, meets the quality standard for fishery water bodies.

The quality of the treated effluent will be monitored and recorded by own laboratory on a daily basis, as well as by an independent certified laboratory – by instrumental measurements, on a monthly basis.

It is necessary to establish water quality control at the place of wastewater discharge, above and below wastewater discharge, according to the values specified by the State Committee for Nature Protection (according to PKM No.14 dated 21.01.2014).

Environmental standards for ELV are developed at the final stage of construction, before the commissioning of the Works as part of the Statement on the Environmental Impact Consequences Statement (EICS) on the basis of the requirements of the Resolution of the Cabinet of Ministers No. 14 dd 21.01.2014. The materials of the EICS are transferred to the State Committee of Ecology of the Republic of Uzbekistan for passing the State Ecological Expertise.

The ELV of pollutants in the treated wastewater are set no higher than the level of background quality of natural water, and not lower than the ELV established for fishery and (or) cultural and domestic surface water bodies in accordance with the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 14 dd 21.01.2014 “On approval of the Regulations on the procedure for developing and approving draft environmental standard”.

5. SOURCES OF IMPACT, AS ELEMENTS OF THE MAIN AND AUXILIARY TECHNOLOGY, THE FUNCTIONING OF WHICH IS THE CAUSE OF ENVIRONMENTAL CHANGE

At the stage of reconstruction, the following impact types are possible:
on atmospheric air;
on water bodies;
noise;
construction waste.

5.1 **Sources of air pollution, the extent of the impact of substances emitted into the atmosphere, the intensity and duration of their impact**

The main sources of air pollution during the construction of designed facilities are internal combustion engines (ICE) of construction equipment, diesel power plants and welding machines.

Potential sources of environmental impact during construction work are the

following:

- movement of transport and equipment;
- operation of welding equipment.

The main pollutants emitted during the construction of the designed facilities are the combustion products of liquid fuels (carbon monoxide, nitrogen dioxide, hydrocarbons, soot, sulfur dioxide, benzopyrene).

By the nature of the entrance of pollutants into the atmosphere, all sources are nonorganized.

Emissions of harmful substances generated during construction work are short-term and will not lead to a change in the prevailing background concentrations of pollutants in the atmospheric air of the survey site at the end of the reconstruction.

There are no bulk emissions in the area under consideration. The possibility of accidental emissions of harmful substances into the air is excluded.

CALCULATION OF AIR EMISSIONS OF HARMFUL SUBSTANCES

SOURCE No. 1

<u>Soil excavation site</u>

Source of emission	- nonorganized
Source of release	- Soil excavation by special equipment
Emitted ingredients	- Inorganic dust - Carbon monoxide - Sulphur dioxide -Nitrogen dioxide -Hydrocarbons - benzo(a)pyrene -soot
Soil excavation	- 210996.19 m^3 of excavated soil*1800 kg/m^3 soil density=379793.15 tons/year
Source Operating Time	- 2400 hours/year

The morphometric and dynamic parameters of the source are characterized by the following data:

H = 2.0 m; D = 0.56 m; V = 2.6 m/s; Q = 0.443m^3/s; T = 30.5 °C

The inorganic dust emission output from the processes of trench soil excavation will be:

$q_1 = K_1 x K_2 x K_3 x K_4 x K_5 x K_7 x H x G x 10^6/3600$, where:

K_1 = 0.03; K_2 = 0.02; K_3 = 1.0; K_4 = 1 (the site is open on four sides);

K_5 = 0.01 (humidity above 10%); K_7 = 0.5

B = 0.5 (dropping height up to 2 m); G = 158.25 t/h

Inorganic dust:

Q_{max}=0.03*0.02*1.0*1*0.01*0.5*0.5*158.25*10^6/3600=0.06593 g/s

Q_{annual} = 0.06593*2400*3600/10^6=0.5697 tons/year

<u>Calculation of emissions of fuel combustion products during the operation of special equipment.</u>

According to the technical characteristics of the special equipment, the specific consumption of diesel fuel is 8.5 kg/h. The qualitative and quantitative characteristics of the emitted harmful substances are determined according to the guidelines [4].

Name of the pollutant	Emissions from combustion of 1 kg of fuel (t)	Total air emission	
		g/s (t/year*10^6 /2400*3600)	tons/year (t*0.0085*h year)
1	2	3	4
Carbon monoxide	0,1	0,236111	2,04
Hydrocarbons	0,03	0,070833	0,612
Nitrogen dioxide	0,04	0,094444	0,816
Sulphur dioxide	0,0155	0,036597	0,3162
Benz(a)pyrene	0,02	0,047222	0,408
Soot	0,00032	0,000756	0,006528

SOURCE No. 2

<u>Soil storage area</u>

Source of emission	-disorganized
Source of release	- soil storage area
Emitted ingredients	- inorganic dust
Amount of soil used	- 379793,15 tons/year
Soil storage time	- 8760 hours/year = 365 days*24 hours
Storage area	- 100m^2

The morphometric and dynamic parameters of the source are characterized by the following data:

H=2 m; D=0.56 m; V= 2.6 m/s; Q = 0.443m^3/s; T=30.5°C

The source of air emission of pollutants is soil storage, which is located in an open area.

The calculation of inorganic dust emission during raw materials storage was carried out according to the method (2):

$$Q = K_3 * K_4 * K_5 * K_6 * K_7 * G * q * F, \text{ g/sec}$$

K_3 - coefficient that takes into account local weather conditions - 1.0:

K_4 - coefficient that takes into account local conditions, the degree of protection of the unit from external influences, dust formation conditions-1;

K_5 - coefficient that takes into account the moisture content of the material - 0.01;

K_6 - coefficient that takes into account the surface profile of the stored material -1;

K_7 - coefficient that takes into account the size of the material - 0.4;

q – dust loss from 1 m^2 -0.002;

F – dusting surface in plan -100 m^2.

INORGANIC DUST:

Q_{max}=1.0*1.0*0.01*1*0.4*0.002* 100=0.0008 g/s

Q year = 0.0008 *8760*3600/106=0.02522 tons/year

SOURCE No. 3

<u>Soil backfilling area</u>

Source of emission	- nonorganized
Source of release	- Backfilling of soil with special equipment
Emitted ingredients	- Inorganic dust - Carbon monoxide - Sulphur dioxide -nitrogen dioxide -Hydrocarbons - benzo(a)pyrene -soot
Soil excavation	-210996.19 m^3 of excavations*1800kg/m3 soil density=379793.15 tons/year
Output rate of special equipment	-158.25 t/h
Source Operation Time	-2400 hours/year

The morphometric and dynamic parameters of the source are characterized by the following data:

H=2.0 m; D=0.56 m; V=2.6 m/s; Q=0.443m^3/s; T=30.5°C

The inorganic dust emission output from the processes of soil excavation from trenches and manholes will be:

$$q_1 = K_1 x K_2 x K_3 x K_4 x K_5 x K_7 x H x G x 10^6/3600, \text{ where:}$$

K_1 = 0.03; K_2 = 0.02; K_3 = 1.0; K_4 = 1 (the site is open on four sides);
K_5 = 0.01 (humidity above 10%); K_7 = 0.5
B = 0.5 (dropping height up to 2 m); G = 158.25 t/h

Inorganic dust:

Q_{max}=0.03*0.02*1.0*1*0.01*0.5*0.5*158.25*10^6/3600=0.06593 g/s

Q year = 0.06593 *2400* 3600/10^6=0.5697 tons/year

Calculation of emissions of fuel combustion products during the operation of special equipment.

According to the technical characteristics of the special equipment, the specific consumption of diesel fuel is 8.5 kg/h. The qualitative and quantitative characteristics of the emitted harmful substances are determined according to guidelines [4].

Name of the pollutant	Emissions from combustion of 1 kg of fuel (g)	Total air emission	
		g/s (t/year*10^6/2400*3600)	tons/year (t*0.0085*h per year)
1	2	3	4
Carbon monoxide	0,1	0,236	1,768
Hydrocarbons	0,03	0,0708	0,5304
Nitrogen dioxide	0,04	0,06679	0,7072
Sulphur dioxide	0,0155	0,03659	0,27404
Benz(a)pyrene	0,02	0,0236	0,1768
Soot	0,00032	0,00075	0,0056576

SOURCE No. 4

Construction site

The source of the emission - nonorganized
Sources of release - PVC pipe welding machine
The source height H - 2 m.
The diameter of the source at the outlet of the mouth, D - 0.35 м
The gas-air mixture velocity at the mouth of the source, V - 4.4 m/s.
The gas-air mixture volumetric flow rate, W - 0.4231m^3/s.
The gas-air mixture temperature, T - 31°C.
The pipeline is laid PVC pipe.

Emissions from sources are calculated in accordance with the "Methodical manual for calculation, regulation and control of pollutant air emissions (supplemented and revised), St. Petersburg, 2005

Specific emission rate of
- vinyl chloride is 0.0039 g/s
- carbon monoxide is 0.009 g/s

Operation time: 2400 hours/year.

Air emissions of vinyl chloride is*:*

M = 0.0039 g/s

M = 0.0039*2400*3600*10^{-6} = 0.03369 tons/year

Carbon monoxide air emission is*:*

M = 0.009 g/s

M = 0.009 * 2400 * 3600 * $^{10-6}$ = 0.07776 tons/year

Total estimated emission for the construction period will be:

#	Name of pollutant	MPC or SRLI* (mg.m3)	Hazard class	Quota magni-tude	Contri-bution %	Emission, tons
1	Carbon monoxide	5	4	0,5	42,98081	4,15776
2	Hydrocarbons	1	4	0,5	12,65309	1,224
3	Nitrogen dioxide	0,085	2	0,25	16,87079	1,632
4	Sulphur dioxide	0,5	3	0,33	6,53743	0,6324
5	Benz(a)pyrene	0,00001	1	0,2	8,435394	0,816
6	Soot	0,15	3	0,33	0,134966	0,013056
7	Inorganic dust	0,5	3	0,33	12,03925	1,16462
8	Vinyl chloride	0,1	1	0,2	0,34827	0,03369
	TOTAL				100	**9,673526**

5.2 **Water consumption and wastewater disposal for domestic needs of workers during construction**

The level of impact of the planned activity on surface waters is determined by the regime of water consumption and sanitation, the quality of wastewater discharged into water bodies, and the conditions for the disposal of surface runoff.

There is no water intake from the water table, as well as wastewater discharge into it during construction.

The impact of the proposed activity on water bodies will be in the form of water intake from existing surface water bodies to meet operational needs.

During construction, water is used for domestic and drinking as well as operational needs.

Water consumption for production needs consists of water usage for soil watering and compaction, as well as dedusting.

Losses of water for soil watering and compaction, as well as dedusting, are irretrievable.

The planned time period for the works is 300 working days.

A temporary field camp is being organized on the construction site. A dry closet (portable toilet) will be installed on the site.

Domestic and drinking water needs will be met by importing water.

Water consumption for domestic needs consists of water consumption for the *drinking needs of workers;*

1. The calculation of water consumption for domestic needs was carried out according to *KMK 2.04.01-98 "Internal water supply and sewerage of buildings", Tashkent, 1998.* Where :

Water consumption:

$$Q = n*k*T$$

Q - Consumption of water for domestic needs

N - drinking water consumption rate per worker, n=25 l,

K - Number of employees k = 20 workers

Q_{day} = 25.0 l/day*20 people = 500 l/day = 0.5 m^3/day

Q_{period}=0.5 m^3/day*300 days = 150 m^3/year.

Domestic wastewater is discharged into a septic tank.

2. We determine water consumption to ensure the operation of shower heads. The water consumption rate per shower head is 500 l/h, the shower is used for 0.75 hours after work.

$$Q_{душ} = \frac{500 \cdot 0{,}75}{1000} \cdot m = 0{,}375 \cdot m \text{ , m}^3\text{/day}$$

where m is the number of shower nets, 1 shower cabin is installed on the territory of the field camp:

$$Q_{душ} = 0{,}375 \cdot 1 = 0{,}375 \text{ m}^3\text{/day},$$

q_{period} = 0.375×300 = 112.5 m^3/period.

3. Watering the work site

During the construction period, 210996.19 m3 of soil will be removed and taken to storage sites. In order to minimize the negative impact of earthworks, wetting (hydro-dedusting) will be carried out. To do this, its moisture content must be brought to 8%.

Therefore, 16879.69 m^3 of service water will be required to wet 210996.19 m^3 of soil for the construction period. Given that the soil excavation will be carried out in 12 months (300 working days), it is necessary to use 56.26 m^3 of water per day.

Total water consumption of enterprises during the construction period:

Designation	Water consumption m^3/day	Water consumption m^3/period
For domestic and drinking needs	0,5	150
Shower water consumption	0,375	112,5
Operation needs	56,26	16879,69
Total	**57,135**	**17142,19**

Total domestic and fecal wastewater disposal:

Designation	Water consumption m^3/day	Water consumption m^3/period
For domestic and drinking needs	0,5	150
Shower water consumption	0,375	112,5
Total	**0,875**	**262,5**

For the collection of household and fecal waste on the territory of the construction site there is a dry closet. As fecal matter accumulates, it is taken to the nearest treatment plant.

5.3 Analysis of the storage conditions of the construction company's waste

During the construction period, it is possible to generate waste of Hazard classes of IV, V, the accumulation of which has a direct negative impact on the site.

The contractor should provide for measures for the safe collection and transportation of waste for processing and disposal.

During the construction and installation period, the following types of waste are generated:

waste from cutting PVC pipes;

wiping rags;

domestic solid waste (DSW);

Repair, refueling of automotive equipment will be carried out at special enterprises, therefore, equipment repair waste and accidental spillage of petroleum products are not generated on the territory of the construction site.

In total, 5 types of waste can be generated at the works in an amount of up to 379808.62 tons/period.

The period of repair and restoration work is 300 working days, the number of working personnel is 20 people.

WASTE GENERATED DURING CONSTRUCTION

1. Calculation of waste generation from cutting PVC pipes

When cutting polyethylene products with a "disk grinder" type manual cutting tool, pipe pieces are formed.

According to the *Ecologist-Expert* Handbook, page 477, the specific rate of waste generation is 6 kg/h. Pipe cutting time is 2400 hours/year

6 kg/h*2400 hours = 14.4 tons/year

The waste is collected in a designated place, where collection tanks is installed, it is then taken to polymer processing plants. The waste is low-hazard and belongs to Class 4.

2. Calculation of the soil formation rate

210996.19 m2 of soil taken out and waste is generated in the form of soil. The density of the soil is 1800 kg/m^3, then the amount of waste will be:

M = 210996.19 m^3*1800 kg/m^3/1000 = 379793.15 t/year

Soil waste is taken to road repair enterprises in the district for using for the projected roads. The waste is low-hazardous and belongs to Class 5.

3. Calculation of formation of waste of worn-out overalls

The standard service life of overalls (suit, trousers, hat, gloves, etc.) is 2 years. In accordance with the staffing schedule of the enterprise, the number of workers is 20 people. The total weight of the overalls is 40 kg.

Therefore, when using out overalls, waste is generated:

40 kg/2 years = 20 kg or 0.02 tons/year

These wastes (oil content is less than 15%), given their fire hazard, should be stored in a metal container and, as they accumulate, used for their own needs, i.e. for wiping technological (process) equipment. Waste belongs to the Hazard Class 4.

4. Calculation of the formation of wiping rags

Waste is generated during the servicing (maintenance) of equipment and wiping of hands, mainly special wiping material, during repair and construction work the wiping material weight in the enterprise will amount to 0.05 kg.

The waste consists of an average of 86% cotton fabric and 14% of fuels and lubricants (Hazard Class 4).

5. Calculation of worker generated domestic solid waste (DSW) rate.

Information for the calculation of domestic waste was taken as per "SanPiN 0297-11", Tashkent, 2011, and amounted to: the standard for the formation of household garbage - 50 kg/person per year.

The construction and reconstruction time is 300 days. The number of employees at the facility is 20 people.

Domestic solid waste generated for the period of construction and reconstruction is - **1.0 ton.**

For the practical collection and storage of this type of waste, the project must provide for a

separate site (area) furnished with special containers. As domestic waste accumulates, it is necessary to take it to the nearest landfill for subsequent disposal under a contract.

Characteristics of waste generated during construction.

No.	waste	Amount t/constr. period	Hazard class
1	**2**	**3**	**4**
1.	PVC pipes	14,4	4
2	Soil waste	379793,15	5
3	Worn-out special clothing	0,02	4
4	Wiping rags	0,05	4
5	DSW	1	4
Total		**379808,62**	

6. EMERGENCY SITUATIONS AND MEASURES TO PREVENT THEM.

To prevent emergencies, the followig measures are envisaged:

- field welds (joints) must be carried out in accordance with the requirements of GOST 16037-8;

-before use, field welds must be cleaned, checked with ultrasound and inspected visually:

- at the end of installation, the pipeline is subjected to overpressure tests.

- application of anti-seismic building structures.

Concrete structures in the ground are made with sulfate-resistant Portland cement. The outer surfaces of these structures, in contact with the soil, have coating insulation with hot bitumen twice and with crushed stone and bitumen blinding.

- monitoring the operation of construction equipment during the period of forced downtime or technical break at work. Parking of equipment during these periods is allowed only when the engine is not running.

- control over the exact observance of the work technology.

- distribution in terms of time of operation of construction machines and mechanisms that are not involved in a single continuous technological process.

- provision of preventive repair of diesel equipment.

- refueling of machines and mechanisms is carried out outside the construction site.

- the use of closed transportation and unloading of building materials that can pollute the air.

- runoff drainage from the sites into special tanks with subsequent pumping with sludge suction into existing drainage network as they are filled;

- the traffic of vehicles is planned on temporary hard road pavements provided for in the volume "Construction Management Plan ".

- preservation and restoration of fertile soil layer;

- improvement of disturbed sites (areas) after the completion of construction and installation works;

Construction work is designed within the boundaries of land allocated for construction. - To prevent pollution and contamination of the environment, the project provides for the transfer of all types of waste to organizations licensed to carry out activities for collection, transportation, processing, utilization, neutralization, disposal of waste of Hazard Classes 1-4, namely:

- in order to prevent littering and cluttering of the territory, periodical waste removal is provided as waste accumulates. - For the temporary accumulation of waste at the construction site, storage hoppers (containers) installed on a hard surface are provided.

For the period of construction, the project does not provide for the intake of water from an open reservoir or the discharge of water into an open reservoir. The source of water for drinking needs is imported bottled water.

- prohibition of washing machines and mechanisms outside specially equipped places;

- equipping workplaces and temporary objects with inventory containers for domestic and construction waste;

- refueling of road-building equipment should be carried out outside the construction area (specially designated places)

- collection of domestic waste in specially designated places;

- it is not allowed to release water from construction sites onto the terrain;

- organization of sites for construction equipment, unloading of building materials, as well as the entry / exit of vehicles to the construction site at the maximum distance from the existing standardized buildings. Ensure that the engines of vehicles are turned off during the period of walking on the construction site.

- installation of a blind fence made of corrugated sheet, 3 m high.

- use of road construction machines with low noise characteristics. Sound insulation of engines of construction and road machines with the help of protective covers and hoods with multilayer coatings, using rubber, foam rubber, etc. Through the use of insulating coatings and gluing of vibration-insulating mats and felt, noise can be reduced by 5 dBA.

- technical means of noise control (the use of technological processes with less noise generation - electrical mechanisms instead of mechanisms with internal combustion engines).

- use of mobile compressor stations in a noise-proof design. To insulate local sources of noise (mobile power plant, compressor, pumps, transformers, etc.), anti-noise screens and enclosures should be used. For example, placing a DK-9M mobile compressor in a sound-absorbing shelter reduces noise by up to 20 dBA. In many cases, noise reduction is achieved by sealing holes in anti-noise coatings and enclosures. Place these noise sources at the maximum distance from existing residential buildings.

- use construction machines, mechanisms and vehicles, mainly during the daytime, which will allow a good rest for residents of the nearby residential areas.

- to ensure the prevention of an outbreak of COVID-19, it is necessary to monitor the cleanliness of the hands - periodically wash them with soap (preferably with an antibacterial effect), and if this is not possible, carefully treat the hands with disinfectants, preferably alcohol-based. To do this, workers will be equipped with personal protective equipment (hand sanitizer and disposable mask);

The construction provides for a sanitary protection zone for the reconstructed water pipelines for household use and drinking purposes in order to ensure their sanitary and epidemiological reliability. The water supply zones will include the zone of the water supply source at the place of water intake, the zone and the sanitary protection strip of water supply facilities (pumping station, water treatment station, tanks) and the sanitary protection strip of water pipelines. Within the sanitary protection strip of water transmission lines there will be no sources of soil and groundwater pollution (latrines, garbage pits, manure storage facilities, garbage receptacles, etc.) situations.

The application of the above measures will reduce the risk of emergency to a minimum,

and if it occurs, it will allow to quickly localize and prevent further spread.

Thus, the project provides for measures that fully prevent the occurrence of emergency situations.

6.1 MEASURES TO REDUCE THE IMPACT ON PERSONNEL

To reduce the negative impact of the works on personnel, it is necessary to carry out the following activities:

- *All personnel must undergo preliminary and periodic medical examinations upon admission to work and in the course of work;*
- *All personnel must be trained in the rules of personal hygiene in the company;*
- *All workers must wear special reflective clothing and helmets, as well as other personal protective equipment, depending on the type of construction work and activities performed;*
- *Personnel engaged in the process of work must strictly follow the instructions informing health and safety and the rules of personal hygiene.*

6.2 AIR BASIN PROTECTION MEASURES

Based on the results of the calculation carried out to establish the impact of emission sources arising from the commissioning of the works, it can be concluded that concentrations exceeding the design quotas (norms) outside the boundaries of the works and in the residential area will not be observed. There is no need for additional measures to reduce emissions, in order to maintain emissions at the existing safe level, it is enough to comply with the operating conditions of the equipment (process equipment) to be used in the project.

To reduce dust pollution and reduce specific odors, the works area (territory) must be landscaped around the perimeter, as well as green spaces of ornamental and fruit trees are to be planted on the adjacent streets.

The harmful impact on the quality of atmospheric air during the operation of transport, construction and installation equipment, during construction and installation works will be limited, since the sources of emissions in the process of work change their location, emissions of pollutants will not occur simultaneously.

The main measures to protect the atmosphere from pollution for the period of construction and installation work include:

- reduction or elimination of long-term idling of engines of construction and installation equipment (machines and mechanisms);
- operation of machines in an optimal mode, minimizing harmful air emissions;
- regular monitoring of the technical condition of machines and mechanisms of construction organizations, checking exhaust gases for carbon dioxide.

6.3 MEASURES FOR THE PROTECTION OF WATER SOURCES

In order to safeguard and prevent pollution, surface and groundwater, as well as to ensure sanitary and epidemiological reliability, in accordance with KMK 2.04.02.-97 and SN 245-71 "For water supply facilities", a number of measures are envisaged to exclude the possibility of ingress of domestic and fecal wastewater:

- *Application of equipment, fittings and pipelines resistant to corrosive properties and ground water,*
- *For sewer and water manholes, chambers and tank structures, waterproofing is used,*
- *The use of anti-seismic building structures.*
- *The concrete of the structures in the ground (soil) is made of sulfate-resistant Portland cement. The outer surfaces of these structures, in contact with the soil, have coating insulation with hot bitumen twice and with crushed stone-bitumen blinding.*
- *For the complete absence of a negative impact on the surface and groundwater on the site, strict supervision of the leak-tightness of the elements of the water supply network is*

sufficient.

During the construction period, it is necessary to provide for and implement the following technical and organizational measures aimed at preventing contamination of the ground surface, and, consequently, groundwater:

1) be sure to observe the boundaries of the sites allocated for construction;

2) maintenance of motor transport and construction equipment shall be carried out at motor transport enterprise base providing this equipment;

3) use technically sound construction machines and mechanisms;

4) prohibit the passage of construction equipment outside the existing and specially created technological passages;

5) equip stationary mechanisms with special trays to prevent spillage of fuel and oils;

6) equip construction sites where machines and mechanisms operate with an adsorbent in case of fuel and lubricant leaks;

7) in case of emergency situation, take timely measures to eliminate them;

6.4 MEASURES TO REDUCE INDUSTRIAL NOISE AND VIBRATIONS

It should be noted that in the process of developing the design, it is necessary to provide for the use of standard equipment that meets the requirements of GOST 17770-72, which provides for vibration-reducing and noise-reducing devices in lieu with GOST 12.4.011-75 (vibration isolation and vibration damping devices).

According to KMK 2.01.08-96 "Noise Protection", the works will not have a significant impact on the formation of the background noise of the location area.

It can be assumed that the works will not have a significant impact on the formation of the background noise of the area where they are located.

6.5 MEASURES TO PROTECT ENVIRONMENT DURING COLLECTION, STORAGE, TREATMENT AND DETOXIFICATION OF WASTE

For the sound (practical) collection and storage of domestic waste, the project must provide for a separate site (area) equipped with improved covers and equipped with special containers (metal or plastic collectors for domestic waste), the total quantity and volume of which should be not less than the volume of domestic waste accumulated within 7 days, as well as monitor its timely removal by trucks of the Housing and utilities infrastructure.

Methods of collection, storage and transportation of waste should exclude the possibility of contamination of the surrounding area, soil of populated areas and ensure the safety of personnel involved in all stages of cleaning and disposal of industrial waste.

- *To collect garbage, install metal containers on a site covered with asphalt.*
- *Garbage receivers and yard latrines should be located 25 м from warehouses, which are cleaned when they are filled for no more than 2/3 of their capacity.*
- *Latrines should be kept clean and disinfected daily.*
- *Removal of garbage and debris from tanks and boxes should be carried out daily, followed by disinfection of garbage receptacles.*

Construction waste generated in the process of construction work must be transferred to waste management facilities or to waste disposal facilities. If it is impossible to use, neutralize it, waste should be disposed of in a timely manner to authorized waste disposal sites (solid waste landfills) or authorized waste storage sites only if there is an appropriate permit for the disposal / storage of industrial waste.

Temporary storage of construction waste (including secondary material resources) prior to their disposal at the above facilities must be carried out within the construction site, on a specially designated area with a solid (compacted soil) base (place of temporary storage).

Construction waste is sorted by hazard classes, collected and stored in containers that protect them from a possible transition from one state of aggregation to another under the influence of precipitation in specially designated temporary storage areas on a site with a hard

surface or a site with a waterproofing coating.

It is strictly forbidden to burn domestic solid waste.

6.6 MEASURES TO REDUCE HARMFUL IMPACT ON SOILS

In order to protect and prevent contamination of the soil cover of the location of the works in accordance with GOST 17.4.3.02-85 "Nature Protection. Soils" and GOST 17.5.3.06-85 "Nature Conservation. Lands" the project should provide for a number of measures.

It is necessary to concrete the area allocated for the placement of metal containers intended for the collection of domestic waste. Monitor the leak-tightness of treatment facilities and storage tanks for the resulting sludge.

Traffic should be carried out only on specially constructed roads that ensure safe traffic that does not cause disturbance of vegetation and soil cover.

Upon completion of construction, the disturbed lands are reclaimed (restored). Land reclamation is carried out in two stages:

The 1st, technical stage – surface grading; waste disposal; bringing land into a state suitable for biological restoration;

The 2nd, biological stage - placing a soil layer, applying organic and mineral fertilizers into the soil, sowing grasses, planting green strips, carrying out anti-erosion measures.

6.7 DESCRIPTION OF THE TYPES OF EXPOSURE DETERMINED BY THE INTRODUCTION OF POLLUTANTS

The impact of the sewer route on the environment will be expressed in the introduction of chemicals, disturbance of the surface and integrity of soils, alluvial and channel biocenoses, and soil excavation.

During construction work, there will be a mechanical disturbance of the surface, temporary removal of soil for pits under the sewerage line supports.

During the operation of sewer networks, there will be no permanent sources of chemical emissions. Periodically, due to technological necessity, planned work will be carried out, as a result of which harmful substances will enter the atmospheric air.

Accidental emissions are possible in case of damage to sewer networks (in accidents).

With the laying of the pipeline in the soil, there is a change in loads, especially during the period of atmospheric or soil moisture entering the soil.

The impact on groundwater is also intermittent, as the depth of the laying does not reach the constant groundwater level. The impact will occur only during the rise in the level due to the penetration of atmospheric moisture, as a result of the infiltration of irrigation water in the fields.

Irretrievable removal of groundwater and the ingress of pollutants into groundwater during construction and operation is excluded.

Disturbance of the structure of the soil cover will occur only in open spaces: on the site of arable land and on wastelands at the edge of the road, as well as on fragmentary soils, at the crossing of a road and a water barrier. The soil profile will be disturbed throughout the depth when laying the reconstructed water supply system with high and partially medium pressure. The fertile layer will be returned to its original place after the completion of work. Mechanical damage to the soil cover occurs within the arable land, wasteland and road.

On the entire land strip allocated for construction, temporary and periodic chemical pollution occurs from emissions from 1 or 2 units of construction equipment during construction.

The impact on synanthropic and semi-aquatic biocenoses will be expressed in the creation of numerous factors of concern.

During the construction period, there is a temporary impact on line communications.

6.8 IMPACTED OBJECTS

The following may be affected by the projected constructed sewer networks route:

- soil, when chemicals fall out of the atmosphere, during construction and earthworks, when lubricating oils and fuel are spilled from the plant (construction equipment) used in construction.
- vegetation, when performing earthworks and in the operation of construction equipment.

6.9 NATURE OF THE IMPACT

The nature of the impact on each of the individual elements of the natural and social environment in the territory of the construction of the sewerage network is differentiated by the intensity of man-made pressure.

The impact on the environment during the construction of the sewerage network will be temporary. The results of the activities will have both reversible and irreversible consequences.

During the period of construction work, from the simultaneous operation of 1-2 units of road-building equipment, insignificant volumes of emissions will be discharged into the atmospheric air. Their impact on the environment is short-lived, the degree of impact is weak, the effects of exposure are reversible.

The degree of impact on the terrain within farmland, residential area, water surface and wastelands is rather weak.

The nature of the impact on soils, during construction, is more diverse, since with the appearance of a sewerage network laid on a sand cushion in loamy soils, it will cause minor dynamic changes, due to a violation of the integrity and a change in the introductory physical properties of soils. In the presence of periodic groundwater, these soils become more corrosive and aggressive. A negative impact is expected not only from the sewerage network on the environment, but also as a result of the development of negative geologist - environmental processes with a subsequent impact on the sewerage network. Thus, on the part of aggressive environments of soils and groundwater, a negative differentiated, but constant in time, impact on individual sections of the route is possible, and in some cases with the processes of influencing the integrity of the sewerage network material.

Given the seismicity of the area, the presence of discontinuous structures through sewerage networks, we can expect the appearance of ground movements, which will cause significant stresses in the pipe-wire pipes. As a result, there may be violations of the integrity of the pipeline.

The impact on the soil cover during the construction of the sewerage system is also short-term and reversible. The consequences due to disturbance of the integrity of and mechanical damage to the soil surface layer from road construction equipment are reversible with the restoration of its profile and fertility in 5-7 years. On the arable land, due to mechanical reclamation and the return of the fertile horizon to its place, the degree of impact will be significantly reduced, but the restoration of fertility without agronomic practice will take 3-4 years. The impact on soil cover within wastelands will be weak due to the low initial fertility of these soils.

Disturbance of the living soil cover integrity during construction and installation works will not be irreversible in connection with the implementation of reclamation leveling, planting crops. On wastelands and along the road, self-restoration of vegetation will occur. Due to the lack of biological reclamation, the restoration of vegetation on these lands will go through weed plants of stiff-leaved grasses.

In general, the impact of the construction of the sewerage network on the conservation and biodiversity of animals will be minimal. This is confirmed by the relatively small amount of work associated with soil disturbance, both in the land area allocated for construction and in the area of removal of the fertile soil layer.

The impact of the construction of the water supply system, as a narrow belt work, on the conservation of mammal and bird species living in this area is minimal and purely temporary. And only during the nesting time (April-June) is it likely that any number of nests will be destroyed and the avifauna will be damaged.

Analysis of the work of similar facilities in other areas shows that it will not have any negative impact on human health and crop yields in adjacent territories.

The nature of the impact on personnel engaged in construction work and servicing the sewerage pipeline route being constructed during operation is due to their contact with technical means that produce vibration and noise, as well as with harmful chemicals.

7. FORECAST OF ENVIRONMENTAL CHANGES AS A RESULT OF IDENTIFIED IMPACTS

An assessment was done of environmental changes as consequences of the identified impacts in the development and modernization of sewerage systems and treatment facilities located on the territory of the Romitan district center, Bukhara region. The environmental impact will be minimal, as it will occur at the stage of the construction of the WWTP. The implementation of the project will lead to an improvement in the environmental situation of the district center by stopping the flow of contaminated wastewater to the terrain, thus preventing soil, earth and groundwater pollution.

The laying of sewerage networks is provided in compliance with engineering and technical requirements. The forecast of the impact in connection with the construction and operation of sewerage networks on the atmospheric air is favorable.

The condition of atmospheric air in the residential area during operating conditions will not deteriorate.

The main concerns about the operation of sewerage networks are caused by the increased tectonic activity of the route section. In the event of intense earthquakes, it is possible to break sewer networks and cause emergencies.

The condition of the surface, soil and vegetation cover within the residential, agricultural areas will temporarily change, but with the implementation of the planned activities and reclamation, the restoration of the ling soil will occur within 2-3 years.

ATMOSPHERIC AIR.

In the construction of sewerage networks, the impact of emissions will be permanent or systematic, and the extent of the impact will depend on meteorological conditions. Under favorable meteorological conditions, the degree of impact will be negligible.

The atmospheric air condition in the residential area during the operation will not change significantly.

SOILS.

The sewerage network route mainly passes through residential areas of the district center, largely underground. At the same time, all the normative requirements will be met.

VEGETATION AND TOPSOIL

The condition of the vegetation and topsoil along the sewerage pipeline route will change only during construction. After the completion of the works, the vegetation cover will be restored within 2 years.

Thus, a comparison of the types and levels of environmental impact before and after the implementation of the project shows that the forecast of the impact in connection with the construction and operation of sewerage networks is favorable, the environmental risk during the implementation of the project will be minimal.

8. CONSEQUENCES OF THE PROJECT IMPLEMENTATION.

The construction of sewerage networks in Karakul is associated with the occurrence of a

number of negative impacts on the district environment during the period of work, mainly on the district's atmospheric air - emissions of inorganic dust as a result of soil movements, emissions from the operation of the engines of equipment used, etc.

The total air emission of pollutants predicted for the construction period is **9.973526 tons/year.**

In the process of construction of sewer networks, water will be used for irrigation and compaction of soils, as well as for dedusting.

Based on the information obtained from the detailed design, 20 workers will be involved in the construction, the planned time period is 300 working days.

Water for domestic needs is provided by importing water. The approximate volume of water for domestic consumption is 0.875 m^3/day or 262.5 m^3/period.

The consumption of service water during the construction period according to the (local resource statement) is 16879.69 m3.

Water consumption in the amount of 16879.69 m3 is irretrievable.

The amount of domestic and fecal effluents is equal to water consumption, according to KMK 2.04.03-97 "Sewerage. External networks and structures"

The total volume of wastewater disposal is 0.875 m^3/day or 262.5 m^3/period.

During the construction period, up to 5 types of waste are generated in the amount of up to 379808.62 tons/period.

For the practical collection and storage of the five types of waste, the project must provide for a separate site equipped with special containers. As domestic waste accumulates, it is necessary to take it to the nearest landfill for subsequent disposal under a contract.

On the territory of the designed works, the existing vegetation is preserved as much as possible. The impact of the Works on the state of the vegetation cover is determined by air emissions of harmful substances.

There are no animal species listed in the Red Book of the Republic of Uzbekistan in the area affected by the Works, no animal epidemics have been registered there.

Due to the absence of a significant impact of the Works on the state of the fauna, changes in the animal world and the consequences of these changes are not expected.

10. REFERENCES.

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Ref.No___
"____" _____ 2023

To Head of
Bukhara Regional
Ecological Expertise Center
_____

The Management **of Bukhoro Suv Ta`minoti LLC** requests you to review the Draft EIS ***(Environmental Impact Statement)*** for the development and modernization of sewerage systems and wastewater treatment facilities located on the territory of the Karaulbazar district center, Bukhara region, and issue an invoice contract for payment of environmental impact assessment.

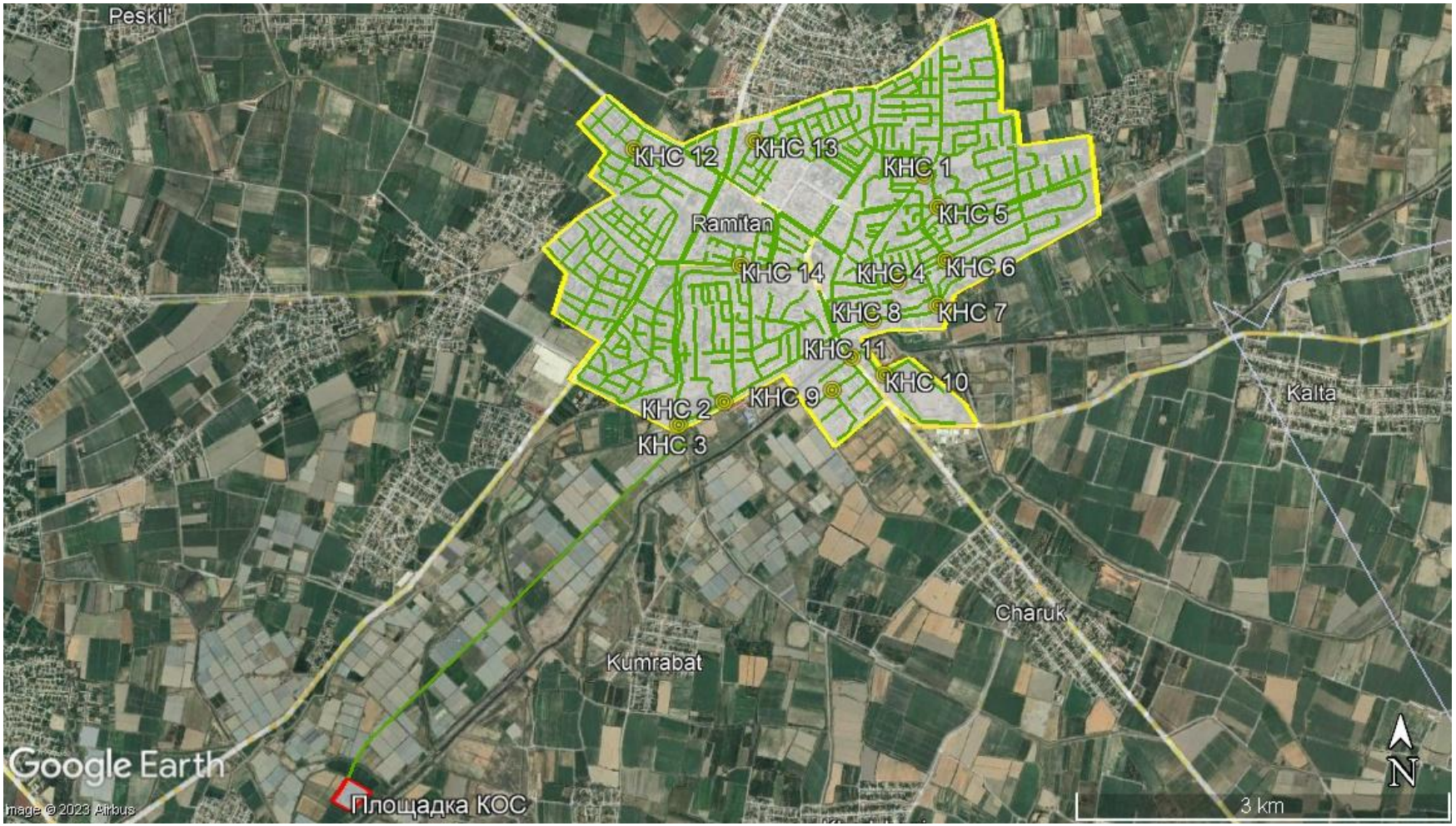
Payment under the contract will be made by (Name of company making the payment)

Payer's details: _____
_____
_____

DIRECTOR of "Bukhoro suv ta`minoti" LLC

Satellite image

for “Development and modernization of sewerage systems and wastewater treatment plants" located on the territory of Romitan city, Bukhara region



Coordinates of the area location.

1. 39°53'24.21"N, 64°20'12.21"E

Head of the Inspectorate of the Bukhara Regional Department of Ecology, Environmental Protection and climate change in Karakul

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APPENDIX 1

DECREE OF CABINET OF MINISTERS OF REPUBLIC OF UZBEKISTAN

ON MEASURES FOR INTEGRATED SOCIO-ECONOMIC DEVELOPMENT OF BUKHARA REGION IN 2019-2023

[Extract]

Over the past decades, as a result of outdated management methods in the economy of the Bukhara region, stable disproportions have formed, which did not allow to fully use the available rich resource potential, including mineral raw materials and labor resources, entrepreneurial ability, a high level of education and labor qualification of the population, natural and climatic conditions and a unique historical heritage for the socio-economic development of the region and the improvement of the standard of living of the population.

In 2018-2019, as part of the socio-economic transformations carried out in the country in the Bukhara region, 235 new enterprises were put into operation due to the development of 1.5 trillion soums of investments, the construction of the Kandym gas processing plant with a capacity of 8 billion cubic meters of gas per year was completed, the housing conditions of more than 90 thousand people were improved through the arrangement of 22 villages and 4 mahallas within the framework of the "Obod Qishloq (Prosperous Village)" and "Obod Mahalla (Prosperous Mahalla" programs, 65 healthcare facilities, 80 secondary schools, 106 preschool education facilities, 1,806.3 km of drinking water pipeline, 727 km of roads were built and reconstructed.

At the same time, with the share of the population of the Bukhara region in the total number of inhabitants of the country at 6 percent, the region's contribution to the industrial production of the republic is 3.7 percent. Only a fifth of the gross regional product is formed in the sphere of industrial production, and the participation of foreign capital in it is 8 percent.

The share of regional exports in the country's total exports is only 2.2 per cent. Exports per capita are 86 US dollars, while the national average is 433 US dollars. The region is in dire need of improving infrastructure, primarily supplying the population with clean drinking water, developing sewerage networks, electricity and roads.

More than 7,300 hectares of land have gone out of agricultural use, while 83 percent of irrigated land is used for the production of only two crops - cotton and grain, which do not provide the necessary level of productivity and profitability for farms.

In order to solve the socio-economic problems facing the region and develop a new development strategy, providing for the direction of managerial, resource and investment potential to the priority areas of the region, the Cabinet of Ministers resolves:

1. To determine the priority areas of socio-economic development of Bukhara region for the period 2019-2023:

a) development of industrial potential with an increase in its growth by 3 times by 2023 due to:

in-depth industrial processing of all types of agricultural, construction and various types of mineral raw materials through the creation of interconnected value chains, up to the production of finished products using modern technologies, including finance and technologies of foreign partners;

creation of territorial, sectoral and intersectoral resource-industrial clusters that ensure innovation, technological and logistical efficiency of the development of value chains;

step-by-step transfer of the entire cotton-growing complex of the region to a cluster form of production organization, which provides technological linkage of the entire process: from the cultivation of high-quality raw cotton to the production of finished export-oriented textile products;

restoration of lost, creation of new and expansion of existing production facilities for in-depth processing of agricultural raw materials, including astrakhan, furs, leather, meat and dairy, fish, fruits and vegetables and industrial crops;

ensuring the efficiency of the development of small industrial enterprises by their territorial concentration in small industrial zones created in each district and city, as well as in the free economic zone "Gijduvan" (hereinafter referred to as "Gijduvan" FEZ);

implementation of major projects in the oil and gas sector, including the expansion of the Gazli underground gas storage facility for sustainable supply to the population and the export of natural gas in winter, as well as the in-depth processing of gas raw materials under the ongoing MTO project with the production of final products: polystyrene, polyethylene terephthalate, synthetic rubbers, spandex, polyurethane, acrylonitrile-butadiene-styrene and other polymers;

b) intensification and diversification of the agricultural sector with an increase in production per hectare from the current 1.2 thousand US dollars to 6 thousand US dollars per year due to:

introduction of progressive intensive methods of agricultural production, providing 2-3 times a year, an increase in yield in cotton and grain growing by at least 1.3 times , fruit and vegetable growing by 1.5-2 times, productivity in animal husbandry by 1.2-1.3 times with high quality and price competitiveness of products;

diversification of agricultural production with the development of existing and the creation of new industries and sub-sectors: cultivation of lemons, various types of nuts, silkworms, fish farming, breeding of fur-bearing animals;

phased introduction of the previously withdrawn 7.3 thousand hectares into agricultural circulation and the development of new 17.3 thousand hectares of land, as well as the introduction of modern methods of soil cultivation and irrigation on 50 thousand hectares of land , optimal placement of crops;

effective use of land plots of personal subsidiary plots of citizens through the introduction of new mechanisms for the provision of state support and assistance by the Council of farmers, dehkan farms and owners of household lands of Uzbekistan;

c) advanced development of production infrastructure, including water supply and sewerage systems, power supply and highways, formed prior to the establishment of the serviced enterprises, due to:

concentration of industrial and industrial-agrarian production in small industrial zones, Gijduvan FEZ and Bukhara Agro Free Economic Zone (hereinafter referred to as Bukhara Agro FEZ), which reduces specific costs for

infrastructure construction;

attraction, along with the funds of the State Budget of the Republic of Uzbekistan and service organizations, also inexpensive long-term preferential credit resources of international financial institutions (hereinafter referred to as IFIs) and foreign government financial organizations (hereinafter referred to as IPFOs), wide development of public-private partnerships;

d) the use of tourism as the most important driver of the development of the region's economy, the transformation of the region into a tourist hub of the republic, including due to:

accelerated development of hotels of international level and creation of the necessary conditions to ensure a comfortable stay of up to 1 million tourists per year by 2023 with an increase in their number by 3-3.5 times, bringing the average income per tourist from the current 200 to 400 US dollars, as well as increasing the share of tourism in the economy of the city of Bukhara to 50 percent;

active development of transport logistics of the Bukhara International Airport by issuing permits to foreign airlines to operate direct flights from the cities of Southeast Asia, establishing and increasing the frequency of road and railway communications with large cities of the republic;

well-thought-out development of pilgrimage tourism and logistical transport routes connecting the 7 holy places of the region;

introduction of a high-quality catering system, including those according to Halol standards;

e) accelerated urbanization of the Bukhara region due to:

phased development in 2019-2030 of the city of Kagan, Gijduvan, Peshku, Karakul districts and the town of Gazli into cities of regional significance, including:

the city of Kagan — through the implementation of high-tech and export-oriented industries, innovative start-up ideas, active stimulation of foreign investment and creation of favorable conditions for entrepreneurial activity in the territory of the Kagan region (the city of Kagan and the Kagan district);

Gijduvan district – through the expansion of the territories of the "Gijduvan" FEZ, the development of ziyorat tourism and trade and entrepreneurial activities;

Peshku District – through the creation of an industrial and construction cluster for deep processing of available mineral resources for the production of building materials, as well as in-depth processing of graphite;

Karakul district — through the development of education and tourism, the organization of a livestock cluster with in-depth processing of raw materials for the production of meat, dairy and leather and footwear products;

the town of Gazli through the implementation of projects in the field of storage and advanced processing of natural gas;

f) increasing the educational and professional potential of the population of the region to an internationally competitive level both in the system of preschool, school, secondary specialized, vocational and higher education for the training of in-demand personnel, associated with programs implemented in all priority sectors and areas of development, and in the system of retraining and advanced training of personnel.

2. Within the framework of certain priorities of socio-economic development of the region, to approve:

target parameters of socio-economic development of Bukhara region, as well as its districts and cities for the period 2019-2023 according to Appendixes No. 1, 1a, 1b, 1c , 1d and javascript:scrollText(4529074)1d;javascript:scrollText(4529062)

the main parameters of economic growth of the Bukhara region for the period 2019-2023 according to Appendix No. 2;

a list of investment projects implemented in 2019-2022 in the Bukhara region, according to Appendix No. 3;

a list of promising investment projects to be developed in 2019-2023 for further implementation in the Bukhara region, according to Appendix No. 3a;

a list of investment projects implemented with the attraction of foreign direct investment in 2019-2020 in the Bukhara region, according to Appendix No. 4;

a list of vacant state-owned facilities in the Bukhara region to be sold to investors at a "zero" redemption value, as well as transferred to state bodies for further effective use, according to Appendix No. 5;

a list of projects in the social sphere implemented in 2020-2022 in the Bukhara region, according to Appendix No. 6;

a list of infrastructure projects implemented in 2019-2023 in the Bukhara region, including at the expense of loans from IFIs and IPFOs, according to Appendix No. 7;

Program of comprehensive measures for the further development of tourism in the Bukhara region for the period 2019-2023, according to Appendix No. 8;

Action plan to promote the socio-economic development of the Bukhara region in 2019-2023 by the embassies of the Republic of Uzbekistan in foreign countries in accordance with Appendix No. 9;

forecast of the development of the export potential of cities and districts of the Bukhara region in 2019-2023 according to Appendix No. 10.

3. Agree to the proposals:

The Ministry of Economy and Industry, the Ministry of Investments and Foreign Trade, the Ministry of Finance, the Chamber of Commerce and Industry of the Republic of Uzbekistan and the hokimiyat of the Bukhara region on the establishment of:

industrial zones specialized in the production of building materials — the construction industry cluster in the Peshku District and the industrial processing of livestock products — the livestock cluster in the Karakul District;

small industrial zones (hereinafter referred to as SIZ) in the Bukhara region on the basis of unused production areas and state-owned facilities according to the list in accordance with Appendix No. 11.

The Ministry of Housing and Communal Services, the Ministry of Energy, the Committee on Roads under the Ministry of Transport of the Republic of Uzbekistan and the Hokimiyat of the Bukhara region shall ensure a

guaranteed supply of external road transport and engineering and communication infrastructures to the territory of the SIZs being created, as well as to the production sites of their participants.

5. By the end of 2019, the Ministry of Construction of the Republic of Uzbekistan, together with the authorized bodies, shall submit for approval the master plans of the city of Bukhara and by the end of 2020 - the city of Kagan, the district centers of Gijduvan, Karakul, Peshka and the town of Gazli in conjunction with the urbanization strategy in the Bukhara region.

6. To take note that agreements have been reached with the Asian Infrastructure Investment Bank on attracting loans for the development and modernization of the water supply and sewerage system, reconstruction and repair of roads in the Bukhara region.

7. The Ministry of Housing and Communal Services and the Committee on Roads under the Ministry of Transport of the Republic of Uzbekistan shall ensure:

by December 31, 2019, the development and approval of a feasibility study (hereinafter referred to as the FS) for investment projects provided for in Appendix No. 7 to this Resolution;

together with the Ministry of Investments and Foreign Trade of the Republic of Uzbekistan, attraction of the necessary financial resources of IFIs and IPFOs within the framework of the implementation of projects approved by this resolution.

The Ministry of Investments and Foreign Trade, together with the Ministry of Housing and Communal Services, the Committee on Roads under the Ministry of Transport of the Republic of Uzbekistan, within a month, shall create a group for the development of feasibility studies for infrastructure investment projects provided for in Appendix No. 7 to this resolution.

8. To determine that the funds for the development of feasibility studies and working documentation of projects in terms of:

construction, reconstruction and repair of public roads, implemented with the participation of IFIs and IPFOs, are allocated within the limits of capital investments provided for the construction and reconstruction of public roads within the framework of investment programs of the Republic of Uzbekistan for 2019 and 2020-2022;

construction, reconstruction and repair of inter-farm rural roads, streets of cities, urban settlements, villages and auls are allocated at the expense of the local budget of Bukhara region;

development and modernization of water supply and sewerage systems, implemented with the participation of IFIs and IPFOs, are allocated within the limits of capital investments provided for by the Fund for the Development of the Water Supply and Sewerage System under the Ministry of Finance of the Republic of Uzbekistan within the framework of the investment programs of the Republic of Uzbekistan for 2019 and 2020-2022.

9. The Committee on Roads under the Ministry of Transport of the Republic of Uzbekistan and the Hokimiyat of Bukhara region shall determine within a month sections of public roads, inter-farm rural roads, streets of cities, urban settlements, villages and auls subject to construction, reconstruction and repair in accordance with the established procedure.

It is categorically forbidden to include in the list of sections subject to construction, reconstruction and repair in accordance with the first paragraph of this paragraph, roads, the actual condition of which corresponds to the conditions of operation, as well as those implemented and completed in accordance with previously approved decisions of the President of the Republic of Uzbekistan and the Government of the Republic of Uzbekistan, taking into account the funds allocated for these purposes.

10. The Ministry of Water Resources, together with the Ministry of Investments and Foreign Trade, the Ministry of Housing and Communal Services and the Ministry of Economy and Industry of the Republic of Uzbekistan, by November 1, 2019, shall submit to the Cabinet of Ministers a draft Program for the Advanced Development of Engineering and Water Infrastructure in the Bukhara region for 2020-2024, ensuring the integrated development of industry, agriculture and tourism in the cities and districts of the region.

11. The Hokimiyat of Bukhara region, the State Assets Management Agency, the Ministry of Investments and Foreign Trade, the Ministry of Economy and Industry of the Republic of Uzbekistan, together with interested ministries, departments and sectoral economic associations, shall ensure the involvement in economic activities of empty and unused facilities, as well as land plots belonging to the state and economic associations specified in the Appendix No. 12.

12. Hokimiyat of Bukhara region:

a) together with the authorized state bodies, within two months, complete all organizational procedures for the establishment of SIEs;

take measures to improve the efficiency of the use of production areas in the territories of SIZs and FEZs;

b) together with the Ministry of Agriculture, the Ministry of Water Resources and the Ministry of Innovative Development of the Republic of Uzbekistan, within two months, submit to the Cabinet of Ministers a draft Program for the Introduction of Innovations, Intensification and Diversification of the Agricultural Sector in the Bukhara Region in 2019-2023, which provides, among other areas:

complete transition to laser soil leveling, introduction of a drip irrigation system on an area of at least 50 thousand hectares;

introduction of high-yielding and high-quality seeds, seedlings and seedlings, effective control of pests of agricultural plants and animal diseases;

return to agricultural circulation of 7.3 thousand hectares, as well as the development of new 17.3 thousand hectares of land with the allocation of returned and newly developed land for lease on a competitive basis to promising agricultural producers, giving them the right to independently determine the placed crops under the obligation to receive income in the equivalent of at least 4-7 thousand US dollars per hectare, as well as preferential rights for producers of export Products;

c) together with the Ministry of Agriculture, the Uztextileprom Association, the Ministry of Economy and Industry and the Ministry of Finance of the Republic of Uzbekistan, within three months, submit proposals to the

Cabinet of Ministers on the phased introduction of a cluster form of organization of cotton-textile production throughout the territory of the Bukhara region and target indicators for the development of the production chain of the cotton-textile sector;

d) together with the Council of Farmers, Dehkan Farms and Owners of Household Lands of Uzbekistan and other authorized ministries and departments, in 2019-2020, to extend to all districts of the region the experience of state support for the effective use of land of personal subsidiary farms, introduced in the Karaulbazar district;

e) ensure, in accordance with the established procedure, the implementation of all necessary measures for the timely allocation of land plots for the construction, reconstruction and repair of roads.

13. Agree with the proposal of the Ministry of Public Education of the Republic of Uzbekistan to establish a Presidential School on the Best Practices of the United Arab Emirates in 2020-2021 in the city of Bukhara.

The Ministry of Public Education, together with the Hokimiyat of the Bukhara region and the Ministry of Finance of the Republic of Uzbekistan, to carry out all the necessary organizational and financial measures to start the functioning of the Presidential School from the 2020/2021 academic year.

14. To establish that when allocating land plots for entrepreneurial activities within a radius of more than 2 km from the engineering and communication infrastructure, the costs associated with the construction and supply of infrastructure networks shall be covered by:

funds of the State Budget of the Republic of Uzbekistan (water and sewerage) and local budgets in equal shares (50:50) — for FEZ;

funds from the budget of the relevant district (city) — for SIEs.

Costs associated with the construction and installation of engineering networks at a distance of up to 2 km, with the exception of FEZ, are covered at the expense of the own funds of the business entity that initiated the project.

15. To determine the following persons responsible together with the Hokimiyat of Bukhara region:

The Ministry of Economy and Industry of the Republic of Uzbekistan – for the effective and timely implementation of projects to create advanced social, industrial, road, engineering and communication infrastructure;

The Ministry of Energy of the Republic of Uzbekistan – for the timely implementation of logistics projects and the expansion of the capacity of the Gazli underground gas storage facility within the stipulated timeframe;

The Ministry of Transport of the Republic of Uzbekistan – for the effective and timely implementation of projects to create road and communication infrastructure within the stipulated timeframe;

The Ministry of Investments and Foreign Trade of the Republic of Uzbekistan - for the effective organization of the activities of the Gijduvan FEZ in the Kagan region by attracting foreign investment in high-tech and export-oriented production in order to fully utilize the capacities of the zone until 2023;

The Ministry of Agriculture of the Republic of Uzbekistan - for the timely development of 3.0 thousand hectares of land on the territory of the Bukhara Agro FEZ with the optimal placement of greenhouses and intensive orchards in them until 2023 and bringing the export of fruits and vegetables of the Bukhara region to 280 million US dollars;

The Uztextileprom Association - for the timely implementation of projects in order to fully develop the processing of cotton fiber from 2020 and cotton yarn from 2023, bringing the export of textile products of the Bukhara region to 260 million US dollars;

The Uzpromstroymaterialy Association – for the development of raw materials for the production of building materials and the effective organization of the activities of the construction industry cluster in the Peshkun district;

The Uzcharmsanoat Association and the Uzbekozikovkatholding holding company for the organization of complete cycles of production of leather, footwear and meat and dairy products (livestock clusters);

Comment by LexUz

The ninth paragraph of paragraph 15 was amended by the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated December 21, 2021 No. 766. See. Text in Uzbek.

The State Committee of the Republic of Uzbekistan for Tourism Development - for taking the necessary measures to achieve the influx of foreign tourists to 1 million people by 2023, increasing the profitability from each tourist to 400 US dollars.

16. Control over the implementation of this resolution shall be entrusted to the First Deputy Prime Minister of the Republic of Uzbekistan – Minister of Transport A.Zh. Ramatov, Deputy Prime Minister E.M. Ganiev and Hokim of Bukhara region U.I. Barnoyev.

Prime Minister of the Republic of Uzbekistan A. ARIPOV

Tashkent city,
September 21, 2019
№ 794

APPENDIX 3

Minutes of meeting
for public hearing on "Development and modernization of water supply and sewerage systems in Bukhara Region (Phase 1, Component 2: Sewerage)" in Romitan District

«Утверждаю»
Заместитель хакима Рамитанского района Бухарской области

_____ У.И.Барноев
«___» _____ 2023 г.

6 апреля 2023 года

ПРОТОКОЛ
Проведение общественного слушания в Рамитанском районе по проекту «Развитие и модернизация систем водоснабжения и канализации Бухарской области (Фаза-1, Компонент -2: Канализация)»

г. Рамитан

Председатель собрания: Назаров Бахтиёр - заместитель директора "Бухоро сув таъминот" по вопросам инвестиции

Присутствовали:
А.Шодиев – заместитель хакима Рамитанского района _____

М.Отабоев – начальник филиала Рамитанского района "Бухоро сув таъминот" _____

Начальник отдела экологии и охраны окружающей среди Рамитанского района Бухарской области А.Хамроев _____

Начальник Санитарно-эпидемиологические службы Рамитанского района Бухарской области Кенжаев Х. _____

Председатель МСГ «А.Навоий» - _____

Председатель МСГ «Гулистан» - _____

Председатель МСГ «Афрасиёб» - _____

Председатель МСГ «Ибн Сино» - _____

Председатель МСГ «Зарафшан» - _____

Председатель МСГ «Бобур» - _____

Председатель МСГ «Ромитан» - _____

Председатель МСГ «Богча» - Д.Облоберdиев

Председатель МСГ «Тарнаут» - _____

Руководство ООО «Бухоро Сув Таъминоти» _____

Данный протокол составлен согласно ПОСТАНОВЛЕНИЮ КАБИНЕТА МИНИСТРОВ РЕСПУБЛИКИ УЗБЕКИСТАН «О ДАЛЬНЕЙШЕМ СОВЕРШЕНСТВОВАНИИ МЕХАНИЗМА ОЦЕНКИ ВОЗДЕЙСТВИЯ НА ОКРУЖАЮЩУЮ СРЕДУ» от 07.09.2020 года.

Цель данного общественного слушания состоит в том, чтобы улучшить и облегчить процесс принятия решений, связанных с Проектом, и создать возможности для своевременного активного участия всех заинтересованных сторон, а также предоставить всем бенефициарам возможность высказать свое мнение и опасения, которые могут повлиять на решения по Проекту Строительство канализационных сетей на территории города Рамитан Бухарской области.

В Рамитане будет осуществляется два компонента (водопровод и канализация) проекта.

Проектом предусмотрено строительство канализационных сетей в г.Рамитан Бухарской области. Проект включает строительство канализационных сетей, насосных станций сточных вод в городе Рамитан. Протяжённость канализационных сетей составляет 102 км. 14 КНС (канализационные насосные станции) будут строится по по городу Рамитан. Работы по строительству канализации будут проводится в районном центре Рамитан в пределах МСГ «А.Навоий», «Гулистан», «Афрасиёб», «Ибн Сино», «Зарафшан», «Бобур», «Ромитан», «Богча» и «Тарнаут».

А также в Рамитанском районе параллельно будут осуществляется работы по строительству водопроводных сетей по всей территорий района.

Также на слушании обозначены воздействия на окружающую среду, которые возможны при строительстве канализационных сетей.

После реализации проекта можно ожидать улучшение санитарно-эпидемиологической обстановки и снижения заболеваемости населения инфекционными заболеваниями. За счет этих проектов будет достигнуто полное прекращение сброса неочищенных стоков в водные объекты, а также значительное снижение подземных вод и поверхностных водотоков.

У.Барноев - во всех этапах работ будут подключены местные специалисты (экологи, специалисты местного водоканала)

Вопрос: Какие новые технологии будут использоваться в рамках данного проекта и как будет решаться вопрос с иловыми осадками.

Ответ – Проектировщик группы консультантов компании «NICOLAS O'DWYER» Т.Позорова разъяснила что будет использоваться замкнутый цикл, при котором иловые осадки будут перерабатываться компост. Иловые осадки будут складывается в бурты куда будут добавлять ветки, стебля, пищевые отходы и т.п. Специальное техника будет ворошить эти бурты где температура будет подниматься до 70°С и таким образом все болезнетворные микроорганизмы погибнуть. Это будет правильным решением потому что конечный продукт уже можно будет использовать как удобрения для земель фермерских хозяйств.

Вопрос от населения – предусмотрен ли техника и технологии для данных проектов.

Ответ Назаров Б.: да предусмотрено в этих целях для всей проектной зоне выделено более одного миллиона долларов США

Ф.Олимов – местный специалисть по социальном вопросам группы консультантов компании «NICOLAS O'DWYER» - дал информации о целях проекта. Вопросы гендерного равенства тоже является приорететом для данного проекта. После запуска

проекта должны на работы вовлечены минимум 30% специалистов женского пола из местных сообществ. Контроль качества условий труда вовремя строительных работ будет осуществлятся ГКП.

В период строительных работ необходимо проведение просветительской пропаганды в школах, махаллаях и поликлиниках по правильному использованию водопровода и канализации.

Вопрос землеотведения будут решаться в рамках законодательства РУз и экологической социальной политики банка AIIB. День проведения данного общественного слушания также является установленной конечной датой (cut-off day) для предотвращения целевого захвата земли.

Ж.Гадаев, местный специалист по окружающей среде: наша цель заключается в охране окружающей среды. Готовится новый документ по ЗВОС. Основная наша работа заключается в изучение влияния строительства на окружающую среду. Негативные воздействия при реализации Проекта, в основном, имеют краткосрочную природу и относятся к стадии строительства, которые предполагают проведение работ за пределами существующих производственных площадок. Эти эффекты включают шум, производимый строительной техникой, местные кратковременные увеличения интенсивности дорожного движения с соответствующими выбросами в атмосферу, нарушение ландшафта и почвенного покрова во время земляных работ и т.д.

В целях безопасного ведения процесса строительных работ необходимо соблюдать следующие правила:

-технологический процесс вести в соответствии с регламентом, строго соблюдать инструкцию по безопасному ведению технологического процесса;

-содержать в исправном состоянии оборудование, насосы для перекачки сточных вод, средств пожаротушения и индивидуальной защиты.

У.Барноев – цель этих проектов направлены на улучшение здоровья и благосостояние населения города Рамитана.

Участниками составлено Постановление на основании вышеизложенного.

ПОСТАНОВЛЕНИЕ:

1. Участники собрания согласны на строительство канализационных сетей, КНС и очистного сооружения города Рамитан в Бухарской области;
2. При функционирование КОС деятельность объекта будет минимально воздействовать на окружающую среду;
3. Инспектором экологии будет вестись контроль за технологическим процессом водоотведения, за исправностью канализационных очистных сооружений;
4. Руководство ООО "БУХОРО СУВ ТАЪМИНОТИ" гарантирует выполнения всех требований, предписанных проектом.

Секретарь собрания Ф.Олимов

Председатель собрания Б.Назаров

Engineering and geological survey
TECHNICAL REPORT
for:
"Bukhara region water supply and sewerage. Romitan District Center"
Sewerage networks.

	Prepared by		Director	
	Jumayev A.A.		Pavlenko A.O.	

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APPENDIXES

(a) Textual

1 A copy of the Client's terms of reference

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3 Table of Indicators of Physical and Mechanical Properties of EGE-1 Clay Soil

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9 Standard penetration test (SPT) results table

b) Graphic

10 Test holes layout plan scale 1:500 12

11. Geotechnical columns with SPT, scale: vert. 1:100, 41 sheets

OVERVIEW

Basis for works

The basis for the performance of engineering and geological surveys is the terms of reference of the client: Nicholas O'Dwyer Ltd.

Purpose

A set of engineering and geological works was carried out to study geological conditions, determine the physical, mechanical and water-physical properties of soils, identify and describe dangerous physical and geological processes on the territory of the design site.

Category of complexity of engineering and geological conditions according to Appendix B, ShNK 1.02.14-09 – I (first).

The design stage is Design Development.

Location

The survey site is located in the city of Romitan, Bukhara region.

Types and scope of completed works

The holes location, types and scopes of field and laboratory works were carried out in accordance with the client's terms of reference, as well as in accordance with the requirements of the current regulatory documents of the Republic of Uzbekistan (ShNK 1.02.09-15 and ShNK 1.02.07-2015) adduced in Table 1.

Table 1

No.	Work type and designation	Unit	Quantity
Fieldwork:			
1	Core drilling of holes Ø 132 mm with a depth of up to 5.0 m	l.m.	105
2	Auger drilling of wells Ø 110 mm with a depth of up to 5.0 m	l.m.	100
3	Standard penetration test (SPT)	test.	51
4	Monolith Selection	monol.	100
5	Sampling of the disturbed structure	sample	60
6	Groundwater sampling	sample	21
Laboratory work:			
1	A Set of Determinations of Physical Properties of Soils	determination	100
2	Determination of soils granulometric composition	determination	39
3	Chemical Analysis of Soil Water Extract	determination	21
4	Chemical Analysis of Groundwater	determination	21

Methodology of engineering and geological works

The scope of field engineering, geological and laboratory work was carried out in accordance with the requirements of the client's terms of reference, taking into account the geological structure of the construction site and is presented in Table No. 1.

Drilling of holes was carried out by the core method (with washing with clay solution) URB-2.5A machines, ∅ up to 132 mm to determine:

- lithological structure;
- sampling of monoliths to determine the physical, mechanical and strength properties of soils;
- depth of groundwater level;
- Soil and water sampling for chemical analysis.

and for SPT.

In order to assess the density of soil composition, i.e. to determine their physical and mechanical properties, an SPT was performed on the wells, according to BS 1377, Part 9 and ASTM D 1586. The SPT was carried out by the percussion method, with the probe immersion to 450 mm. The weight of the hammer was 63.65 kg, the height of the hammer drop was 76.2 cm, the maximum number of blows was 50 blows.

Monoliths were sampled from the holes with a sampling tube and a 20-30 cm high core pipe. On the monoliths taken from the holes, the physical, mechanical, deformation and strength properties of the soils was determined in relation to the requirements of the terms of reference, taking into account the lithological

structure of the site.
RST Uz 817-97 "Soils. Methods of Laboratory Determination of Granulometric (Grain) and Microaggregate Composition";
The granulometric composition of soils is determined in accordance with RST Uz 817-97.
A total of 41 linear meters were drilled. Surveys were carried out to determine:
Office processing of field and laboratory work was carried out in accordance with the requirements of regulatory documents of the Republic of Uzbekistan.
Contractors
Field engineering and geological works were carried out by Jumayev A.A., a specialist of the department, geologist
Laboratory work to determine the granulometric composition of the soil, as well as chemical analyses of soil water extracts and groundwater were carried out in the soil and chemical laboratory.
Office processing of field and laboratory work, collection and generalization of archival materials, as well as compilation of this report were carried out by geologist A.A. Jumayev.
Regulatory Documents
Engineering and geological surveys were carried out in accordance with the technical requirements of the client and the requirements of regulatory documents given in the "References" section.

Climatic characteristics of the work area

The climatic characteristics of the area are given according to the data of the Bukhara meteorological station.
The work area is characterized by a sharply continental climate with vast fluctuations in temperatures, both in daily and annual terms.
The coldest month is January, the hottest is July.
The absolute minimum is -24.9°C, the absolute maximum is +46.0°C. The first frosts begin in late October - early November, the last frosts are observed in March.
The average number of days with snow cover is 13. Relative humidity is characterized by an average long-term "value of 57%. The number of days with a relative humidity of more than 80% is only 39.
The average precipitation is 144 mm.
On an annual basis, northerly winds prevail (Fig. 2).
The average annual wind speed is from 2.9 m/s to 3.3 m/s. Prevailing wind speeds are 1-5 m/s.
Maximum wind speeds can reach hurricane speeds when a huge mass of sand is lifted into the air.
Table 2 below shows the main climatic indicators characterizing the climate of the study area.

CLIMATIC INDICATORS FROM BUKHARA M/ST.

Table 2.

Indicator	MONTHS												Avg. An-nual	Abs. mini-mum ,°	Abs. Ma[, °
	I	II	III	IY	Y	YI	YII	YIII	IX	X	XI	XII			
Air temperature, (°C)	0,4	2,7	8,4	16,5	22,3	26,7	28,4	25,7	20,1	13,1	6,7	2,3	14,4	24,9	46
Average daily range of air temperatures, (°C)	10,1	11,3	12,6	14,3	16,0	16,7	16,4	16,5	17,6	17,1	14,6	10,7			
Partial pressure of water vapour, (hPa)	5,0	5,5	7,3	10,1	11,2	12,7	14,6	13,3	10,2	7,7	6,2	5,5			
Relative humidity, %	75	71	67	58	43	37	39	41	46	53	65	77	56		
Absolute air humidity, %	2,0	2,8	4,8	9,7	17,5	24,3	25,9	21,2	14,7	8,7	4,5	2,2	11,6		
Amount of precipitation, mm	18	21	28	26	10	3	1	0	0	5	13	18	144		
Wind speed, m/sec	2,9	3,2	3,5	3,6	3,8	4,0	4,0	4,1	3,3	2,6	2,5	2,5	3,3		

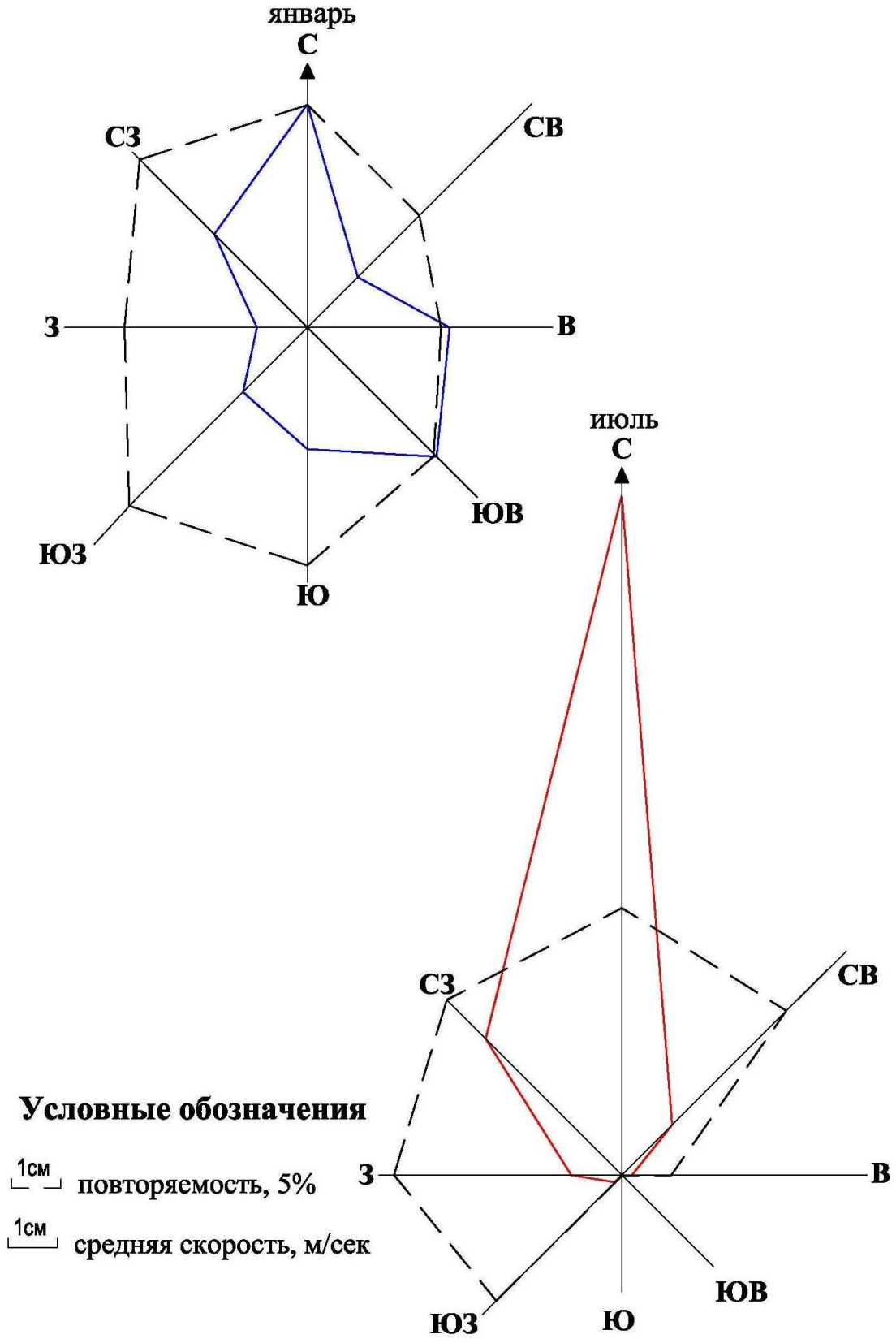
Table 3

WIND DIRECTION FREQUENCY AND SPEED IN JANUARY AND JULY

Repeatability of wind direction (numerator), % Average velocity by direction (denominator), m/sec Calm repeatability, %																	
JANUA R Y									JULY								
N	**NE**	**E**	**SE**	**S**	**SW**	**W**	**NW**	**CALM**	**N**	**NE**	**E**	**SE**	**S**	**SW**	**W**	**NW**	**CALM**
22 4,5	7 3,2	41 2,7	18 3,7	12 4,8	9 5,1	5 3,7	13 4,8	37	67 5,4	7 4,7	1 1	0 -	0 -	1 3,6	5 4,6	19 5	25

Wind rose
Bukhara m/s

Рис. 2



3. GEOLOGICAL STRUCTURE, HYDROGEOLOGICAL CONDITIONS AND PHYSICAL AND MECHANICAL PROPERTIES OF SOILS

3.1. Geological structure

Rocks of the Meso-Cenozoic age, lying on the Paleozoic foundation, take part in the geological structure of the district.

The basement rocks were brought to the daytime surface only in the cores of the young Central-Kyzylkum uplifts, to the north of the Gazli epicentral zone, and far enough to the east of the latter, in the uplifts of the western gaols of the Turkestan and Zeravshan systems of the Southern Tien Shan.

The Mesozoic-Cenozoic sedimentary cover on most of the Turanian Plate is formed by Jurassic deposits, and in the deepest depressions rocks of the Triassic and Permo-Triassic are known. However, in many places, various rocks of the Cretaceous, Paleogene and Neogene lie directly on the foundation.

Jurassic sediments are exposed only by deep wells and are represented by limestone, clay, sandstone and conglomerates. Thickness is 150 m.

The Cretaceous deposits are represented by alternating layers of sandstones, clays with layers of siltstones and limestones. The total thickness of the Cretaceous deposits is from 400 to 1200 m.

Paleogene and Neogene deposits are most widespread within the area and are represented by marine formations of the Paleogene and continental deposits of the Neogene.

The undifferentiated stratum of Paleogene-Neogene deposits is everywhere overlain by a little-powerful cover of modern Quaternary thickness. The latter are represented by Aeolian gray fine-grained, dusty sands. On the territory of the city, they lie mainly in a continuous cover with a thickness of 0.2-4.5 m.

Paleogene-Neogene deposits are represented by an interlayer of sandstones, siltstones and clays.

The sandstones are gray, brown, small, on clay cement, with layers of siltstones and clays with a thickness of 0.3-1.5 m in places with the inclusion of crushed stone up to 10-20% with a high content of gypsum with sandstone layers on carbonate cement. When saturated with water, sandstones melt and turn into quicksand sands.

The research thickness of archival materials is more than 19m. Within the study area, they are distributed everywhere and lie either immediately under Aeolian sands, or in the form of lenses and interlayers in siltstones and clays with a thickness of 0.5 to 10.0 m or more.

Siltstones are gray, light brown and reddish-brown in color, with a shell fracture, dense, fractured, with layers of sandstones, clays and gypsum.

In the upper part of the section, siltstones are weathered, they occur mainly in the form of interlayers and lenses in sandstones and less often in clays in the intervals of 0.5-9.1 m.

Their thickness is 0.3-10.0 m.

The clays are gray, light green, thinly layered, sanded, heavily plastered, sometimes with lenses and interlayers of sandstones and siltstones. They lie in depth intervals of 0.4-16.2 m.

The uncovered thickness of clays is from 1.0 to 14.0 m. Their roof is a regional reservoir for infiltration waters.

3.2. Hydrogeological conditions

In the general complex of Meso-Cenozoic deposits, several aquifers are distinguished. Basically, these are confined waters with a pressure.

These waters are characterized by high mineralization, the content of dense residue varies from 5.6 to 16.5 g /l and are unusable.

The main aquifer most suitable for use is the Senonian, characterized by better quality compared to the overlying horizons and having good water availability.

The depth of the confining overlying bed varies from 10 m to 100 m. near its exits to the surface at mountain elevations and up to 800 m. in the central part. The specific flow rate of wells varies from 0.1 to 1.3 l/sec. The piezometric level is set at a depth of up to 30 m.

The seasonal regime of underground waters is unsteady, depends on the intensity of their supply by atmospheric and irrigation waters.

The mineralization of groundwater is characterized by the amount of dense residue from 2530 mg/l to 18068 mg/l, the content of sulfate ions from 1008 mg/l to 6817 mg/l, chlorine from 343 mg/l to 4795 mg/l.

Groundwater in the main research area, during the survey period (March 2023), was uncovered at depths of 1.2-4.5 m from the ground surface.

At the calculated minimum, groundwater should be expected to be 1.0 m higher than measured, i.e. at depths of 0.2-3.5 m from the earth surface.
Groundwater, according to Table. 6 and 7 of KMK 2.03.11-96, from non-aggressive to highly aggressive to concretes of normal water resistance (W4) on Portland cement according to GOST 10178-85* and non-aggressive to concretes of the same density on sulfate-resistant cements according to GOST 22266-94, from mildly aggressive to medium aggressive on reinforcement of reinforced concrete structures with periodic wetting.

3.3. Physico-mechanical and chemical properties of soils

In accordance with the lithological structure, genetic and age characteristics, physical and mechanical properties in the studied areas within 5.0 m of the soil thickness, five engineering-geological elements were identified:

EGE-1. Loams and sandy loams (above GWL);
EGE-2. Sandy loams and loams (below GWL);
EGE-3. Sands;
EGE-4. Gravel and sandy cobble.

3.4. ENGINEERING AND GEOLOGICAL CONDITIONS

In the studied area, the 5.0-meter thickness studied is composed of modern quaternary alluvial deposits of the Amudarya complex (aQIVam).
The amount of dense soil residue is 1330-17780 mg/kg; the content of Cl' ions is 170-3490 mg/kg; SO_4" ions are 480-10560 mg/kg.
Soils according to the content of easily soluble salts according to the table B 22 of GOST 25100-2020 are estimated as medium saline. According to the content of sulfates for concrete grade W4, water resistance is estimated as from non-aggressive to highly aggressive to concrete on Portland cement according to GOST 10178-85* and from non-aggressive to medium aggressive to concrete on sulfate-resistant cements according to GOST 22266-94 and from non-aggressive to medium aggressive for reinforced concrete structures for dry zone.
EGE-1. Sandy loams and loams (above GWL) - loess-like, brownish-gray and gray in color, macroporous, dusty, from a hard to a refractory consistency with sand layers. Penetrated thickness is 0.7-3.7 metres.
The subsidence category of the soils is I (first).
Normative values of EGE-1 soils in the studied area are given in Table. 4, their quantitative characteristics are given in the text Appendix 3.

Normative values of the soil characteristics of EGE-1

Table 4

Description of characteristics	Measurement unit	Normative values	Calculated value at α=	
			0,85	0,95
Soil density	t/m^3	1,69	1,66	1,63
Soil density in a dry state	t/m^3	1,44		
Density of soil particles	t/m^3	2,69		
Porosity	b	46,5		
Porosity coefficient	b	0,869		
Natural humidity	fractional unit	0,176		
Degree of humidity	b	0,55		
Humidity at the yield point	fractional unit	0,262		

Humidity at rolling limit	fractional unit	0,262		
Index of plasticity	fractional unit	0,077		
Index of liquidity	b	<0		
Specific cohesion	kPa	13.0	8.0	5.0
Internal friction angle	degree	25	23	22
Modulus of deformation: at natural humidity	MPa	6.5		
at water saturation	MPa	3.0		
Relative subsidence at P= 0,1 MPa 0,2 MPa 0,3 MPa	b	0.010 0.017 0.026		
Initial subsidence pressure	MPa	0.10		

Design resistance of soils in the natural state R_0=372,5 kPa (3.73 kgf/cm2) and R_0=189 kPa (1.89 kgf/cm2) for water-saturated soils according to table 4 of Appendix 3 of KMK 2.02.01-98.

EGE-2. Sandy loams and loams (below GWL) - loess-like, light-brown and grey in colour, in some places plastered, with interlayers of dusty sand, from fluid-plastic to fluid consistency.
Opened thickness is 1.0-4.4 m.
The soils of this element are watered, not subsident.
Normative values of EGE-2 soil characteristics for the research area are given in Table 5 of the text, their quantitative characteristics are given in the text Appendix 4.

Table 5
Normative values of the soil characteristics of EGE-2

Description of characteristics	Measurement unit	Normative values	Calculated value at α=	
			0,85	0,95
Soil density	t/m^3	1,93	1,89	1,87
Soil density in a dry state	t/m^3	1,52		
Density of soil particles	t/m^3	2,69		
Porosity	b	43,6		
Porosity coefficient	b	0,774		
Natural humidity	fractional unit	0,273		
Degree of humidity	b	0,95		
Humidity at the yield point	fractional unit	0,258		
Humidity at rolling limit	fractional unit	0,179		
Index of plasticity	fractional unit	0,079		
Index of liquidity	b	>1.0		
Specific cohesion	kPa	17.0	12.0	7.0
Internal friction angle	degree	25	24	23

at water saturation	MPa	4,5		

The design resistance R_0 = 197 kPa (1.97 kgf /cm2), Table 3 of KMK 2.02.01-98 Appendix 1.3.

EGE-3. Sands – gray, multi-grained (powdery, fine, gravelly, medium-sized and coarse), water-saturated, with layers of sandy loam, in places with fragments of sandstone, loose and medium-density addition.
Penetrated thickness of 0.3-4.7 m.
The normative values of the soil characteristics of EGE-3 are given in Table 6 of the text and Appendix 5.
Table 6
Normative values of soil characteristics of EGE-3

Description of characteristics	Meas-urement unit	Norma-tive values	Calculated value at α=	
			0,85	0,95
Density of soil particles	t/m^3	2,65		
Soil density	t/m^3	1,92	1,89	1,87
Soil density in a dry state	t/m^3	1,51		
Specific soil gravity	kN/m^3	19,2		
Porosity	%	42,8		
Porosity coefficient	b	0,750		
Natural humidity	fraction al unit	0,265		
Degree of humidity	b	0,94		
Internal friction angle	degree	32	30	29
Specific cohesion	kPa	3		
Modulus of deformation	MPa	16,0		
Angle of natural slope: dry; underwater	 degree degree	 31 37		
Filtration coefficient	m/day	10,0		

The design resistance for dusty sands is R_0 = 100 kPa (1.0 kgf/cm^2) according to table 2 of KMK 2.02.01-98 Appendix 3.

EGE-4. Gravel-pebble soils – includes gravel-pebble soils represented by fragments of sedimentary and metamorphic rocks with sandy-clay filling, water saturation. The pebbles are well-rounded consisting of igneous and sedimentary rocks.
IGE-4 soils underlie all the above-described soils. The IGE-4 roof in the study area is opened at depths from 3.0 to 4.5 m.
With an open thickness of 0.5-2.0 m
The IGE-4 soils are not subsident.
The normative values of the soil characteristics of IGE-4 are given in Table 7 of the text and Appendix 6.
Table 7
Normative values of the characteristics of EGE-4 soils

Description of characteristics	Measurement unit	Normative values	Calculated value at α=	
			0,85	0,95
Density of soil particles	t/m^3	1.95		
Specific cohesion	kPa	0		
Internal friction angle	degree	38		
Modulus of deformation	MPa	50		
Soil conversion factor		1.25		
Filtration coefficient	m/day	20-50		
The characteristics of pebble soils are given according to the “Bulletin of technical information of UzGIITI No. 34”.				

Design resistance R_0 = 600.0 kPa (6.0 kgf/cm^2).

MODERN GEODYNAMIC PROCESSES AND OCCURANCES

Of the modern geodynamic engineering and geological processes in the survey area, the following are encountered:
Seismicity
Subsidence;
Flooding;
Salinization.

CONCLUSIONS AND RECOMMENDATIONS

The basis of the designed route will be the soils of engineering-geological elements of EGE-1, EGE-2, EGE-3 and EGE-4, the normative and calculated values of physical, strength and deformation characteristics of which are given in Tables 4, 5, 6 and 7 of the text and Appendixes 3, 4, 5, 6 and 7.

EGE-1. Sandy loam and loams (above GWL);
EGE-2. Sandy loam and loams (below GWL);
EGE-3. Sand;
EGE-4. Gravel-pebble soils.

EGE-1. Sandy loam and loams (above GWL) are loess-like, brownish-gray and gray in color, macroporous, dusty, from a hard to a refractory consistency with layers of sand.
Penetrated thickness is 0.7-3.7 m.
The initial subsiding pressure is 0.10 MPa.
The type of ground conditions for subsidence is I (first).

EGE-2. **Sandy loam and loams (below GWL)** are loess-like, brownish-gray and gray in color, dusty, with layers of multi-grained sand, from fluid-plastic to fluid consistency.
Penetrated thickness is 1.0-4.4 m.
The soils of this element are watered, not subsident.

EGE-3. Sands are gray, multi–grained (powdery, fine, gravelly and medium-sized and coarse), water-saturated, with layers of sandy loam, in places with fragments of sandstone, loose and medium-density addition.

EGE-4. Gravel-pebble soils includes gravel-pebble soils represented by fragments of

sedimentary and metamorphic rocks with sandy-clay aggregate, water saturation. The pebbles are well-rounded consisting of igneous and sedimentary rocks.
IGE-4 soils underlie all the above-described soils. The IGE-4 roof in the study area is opened at depths from 3.0 to 4.5 m.
With an open thickness of 0.5-2.0 m
The IGE-4 soils are not subsident.

Soils according to the content of easily soluble salts, according to the table B 22 of GOST 25100-2020 are estimated as medium saline. According to the content of sulfates for concrete W4 grade, water resistance is estimated as from non-aggressive to highly aggressive to concrete on Portland cement according to GOST 10178-85* and from non-aggressive to medium aggressive to concrete on sulfate-resistant cements according to GOST 22266-94 and from non-aggressive to medium aggressive for reinforced concrete structures for the dry zone.
Groundwater during the survey period (March 2023) was uncovered at depths of 1.2-4.5 m from the earth surface.
Groundwater, according to Table 6 and 7 of KMK2.03.11-96 from non-aggressive to highly aggressive to concretes of normal water resistance (W4) on Portland cement according to GOST 10178-85* and non-aggressive to concretes of the same density on sulfate-resistant cements according to GOST 22266-94, from mildly aggressive to medium aggressive on reinforcement of reinforced concrete structures with periodic wetting.
Dangerous geological processes – seismicity, possibly flooding, aggressiveness of soils and water.
The seismicity of the area according to Amendment 1 to KMK 2.01.03-19 for the Romitan city is 7 (seven) points with a repeatability of 1 every 50 years.
The category of soils by seismic properties is III (third).
The maximum depth of soil freezing according to Table 13 of KMK 2.01.01-94, consists of 45 cm – possible once every 10 years; 57 cm – possible once every 50 years (according to Navoi m/s).
Soils according to the method of excavation by mechanisms (based on their density), according to the additions and amendments to the technical part of the SHNK 4.02.01-04 (Table 1-1a), correspond to the points and groups:
Bulk soils - item 26, with a soil density of 1800 kg/m^3;
Soil-vegetation layer - item 9, with a soil density of 1200 kg/m^3;
EGE-1. Loam and sandy loam (above GWL) item 35, item 36, with a density of 1640 kg/m^3;
EGE-2. Sandy loams and loams (below GWL) item 36, item 35 with a density of 1930 kg/m^3;
EGE-3. Sands, item 29, with a density of 1920 kg/m^3;
EGE-4. Pebble gravels, item 6, with a density of 1950 kg/m^3;

Recommended engineering measures:
Anti-seismic in accordance with the requirements of KMK 2.01.03-19
Regional drainage with a dewatering rate of more than 2 m and enhanced waterproofing of soil parts of buildings and structures, underground communications in accordance with the requirements of SNiP 2.06.15-85 and MSN 2.03.02-2002
Anti-aggressive in accordance with the requirements of KMK 2.03.11-96;
Anticorrosive in accordance with the requirements of GOST 9.602-2005.
Reclamation of the soil and vegetation layer in accordance with the requirements of ShNK 1.02.09-15 and KMK 2.02.01-98.
Fill soils are subject to removal ShNK 1.02.09-15

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6. LITERATURE

1. RST Uz 682-96 “Soils. Selection, packaging, transportation and storage of samples”;
2. GOST 5180-84 “Soils. Methods for laboratory determination of physical characteristics”;
3. RST Uz 785-97 “Soils. Methods for laboratory determination of subsidence characteristics”;
4. GOST 12248-96 “Soils. Methods for laboratory determination of strength and deformability characteristics”;
5. GOST 25100-11 “Soils. Classification”;
6. RST Uz 751-96 “Soils. Methods for laboratory determination of swelling and shrinkage characteristics”;
7. RST Uz 817-97 “Soils. Methods for laboratory determination of granulometric (grain) and microaggregate composition”;
8. GOST 26423-85 – GOST 26428-85 “Soils. Methods for determining the cation-anion composition of aqueous extract”;
9. RST Uz 20522-96 “Method of statistical processing of test results”;
10. KMK 1.02.07-97 “Engineering surveys for construction”;
11. ShNK 1.02.09-09 “Engineering geological surveys for construction”;
12. Technical Information Bulletin of UzGIITI No. 34
13. RST Uz 739-96 “Soils. Field test method by dynamic probing”;
14. ShNK 4.02.04-04 “Collection of elemental resource standards for construction work. Excavation”;
15. KMK 2.02.01-98 “Foundation of buildings and structures”;
16. KMK 2.03.11-96 “Protection of building structures from corrosion”;
17. KMK 2.01.01-94 “Climatic and physical-geological data for design” .
18. Sulfate-resistant cements. Technical conditions”.
19. GOST 10178-85 “Portland cement and Portland slag cement. Technical conditions”.
20. KMK 2.01.07-96 “Loads and impacts”.
21. KMK 2.01.03-19 “Building codes and regulations. Construction in seismic areas”;
22. GOST 9.602-2005 “Soil structures. General requirements for corrosion protection”.
23. GOST 20522-96 “Soils. Method for static processing of characteristics determination results”.

APPENDIX

Appendix 1

Copy of technical assignment

Catalog of lithological description exploring openings

No.	Description of soils	Numbering of workings (openings)										
		Cd-1	Ad-2	Cd-3	Ad-4	Cd-5	Ad-6	Ad-7	Cd-8	Ad-9	Cd-10	Cd-11
		Depth, m										
1	Soil-vegetative layer	0.0-0.4	-	0.0-0.3	0.0-0.3	0.0-0.3	0.0-0.3	0.0-0.3	-	0.0-0.3	0.0-0.5	0.0-0.3
2	Bulk soils	-	0.0-0.6	-	-	-	-	-	0.0-0.8	-	-	-
3	Loams and sandy loams from light to heavy, from gray to gray-fawn in color, from hard to hard-plastic consistency, with layers of silty sand	-	-	0.3-2.5	0.3-2.0	0.3-3.8	0.3-1.0	-	0.3-3.0	0.3-3.5	0.5-2.5	0.3-3.5
4	Loams and sandy loams, brownish-gray and grey in color, with layers of sand of different grains, from fluid-plastic to fluid consistency	-	0.6-5.0	2.5-5.0	2.3-4.4	3.8-5.0	-	-	3.0-5.0	-	3.5-5.0	-
5	Sand is gray, different-grained (silty, fine, gravelly, medium-sized and coarse), water-saturated, with layers of sandy loam, in places with sandstone fragments, loose and medium-density.	0.4-3.0	-	-	2.0-2.3 4.4-5.0	-	1.0-4.5	0.3-5.0	-	3.5-5.0	2.5-3.5	3.5-5.0
6	Gravel-pebble soils represented by fragments of sedimentary and metamorphic rocks with sandy-clayey filler, water saturation. The pebbles are well rounded, consisting of igneous and sedimentary rocks.	3.0-5.0	-	-	-	-	4.5-5.0	-	-	-	-	-
9	Total opening depth, m Cd	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
10	Groundwater level, m	1.3	2.5	2.4	3.2	4.2	1.8	3.8	2.8	3.3	2.3	3.8

Note: Cd - core drilling hole; Ad - auger drilling hole;

No. p/p	Description of soils	Numbering of workings (openings)										
		Cd-12	Cd -13-	Ad-14	Cd-15	Ad-16	Cd-17	Ad-18	Cd-19	Ad-20	Ad-21	Cd-22
		Depth, m										
1	Soil-vegetative layer	-	-	-	-	-	-	-	-	-	-	-
2	Bulk soils	0.0-0.5	0.0-1.2	0.0-1.2	0.0-0.8	0.0-1.0	0.0-0.5	0.0-0.5	0.0-1.0	0.0-0.8	0.0-1.5	0.0-1.5
3	Loams and sandy loams from light to heavy, from gray to gray-fawn in color, from hard to hard-plastic consistency, with layers of silty sand	0.5-4.0	1.2-2.0	1.2-2.6	0.8-3.0	1.0-3.5	0.5-3.5	0.5-3.3	-	0.8-2.5	-	-
4	Loams and sandy loams, brownish-gray and gray in color, with layers of sand of different grains, from fluid-plastic to fluid consistency	4.0-5.0	-	1.2-4.0	3.0-4.2	-	3.5-5.0	3.3-5.0	-	-	-	-
5	Sand is gray, different-grained (silty, fine, gravelly, medium-sized and coarse), water-saturated with layers of sandy loam, in places with sandstone fragments, loose and medium-density.	-	2.0-5.0	4.0-5.0	4.2-5.0	3.5-5.0	-	-	1.0-5.0	2.5-5.0	1.5-3.0	1.5-4.0
6	Gravel-pebble soils, represented by fragments of sedimentary and metamorphic rocks with sandy-clayey filler, water saturation. The pebbles are well rounded, consisting of igneous and sedimentary rocks.	-	-	-	-	-	-	-	-	-	3.0-5.0	4.0-5.0
9	Total mine depth, m Cd	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
10	Groundwater level, m	4.0	3.5	3.5	3.0	3.7	3.5	3.5	4.2	2.8	1.2	2.2

Note: Cd - core drilling hole; Ad - auger drilling hole;

No. p/p	Description of soils	Numbering of workings (openings)										
		Ad-23	Cd-24	Cd-25	Cd-26	Ad-27	Cd-28	Cd-29	Ad-30	Ad-31	Cd-32	Ad-33
		Depth, m										
1	Soil-vegetative layer	0.0-0.5	-	0.0-0.3	0.0-0.3	-	-	-	-	0.0-0.3	-	0.0-0.3
2	Bulk soils	-	0.0-0.8	-	-	0.0-0.9	0.0-1.0	0.0-1.0	0.0-1.3	-	0.0-0.8	-
3	Loams and sandy loams from light to heavy, from gray to gray-fawn in color, from hard to hard-plastic consistency, with layers of silty sand	-	0.8-2.5	0.3-1.5	0.3-1.5	0.9-2.1	1.0-2.9	1.0-3.0	0.3-4.0	0.3-2.5	0.8-4.0	0.3-2.5
4	Loams and sandy loams, brownish-gray and gray in color, with layers of sand of different grains, from fluid-plastic to fluid consistency	-	-	-	-	-	2.9-4.5	3.0-4.5	4.0-5.0	2.5-5.0	4.0-5.0	2.5-5.0
5	Sand is gray, different-grained (silty, fine, gravelly, medium-sized and coarse), water-saturated, with layers of sandy loam, in places with sandstone fragments, loose and medium-density.	0.5-4.0	2.5-5.0	1.5-5.0	1.5-5.0	2.1-5.0	4.5-5.0	4.5-5.0	-	-	-	-
6	Gravel-pebble soils, represented by fragments of sedimentary and metamorphic rocks with sandy-clayey filler, water saturation. The pebbles are well rounded, consisting of igneous and sedimentary rocks.	4.0-5.0	-	-	-	-	-	-	-	-	-	-
9	Total mine depth, m Cd	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
10	Groundwater level, m	3.0	2.7	2.7	3.5	2.7	3.2	3.3	4.5	2.8	4.4	2.9

Note: Cd - core drilling hole; Ad - auger drilling hole;

No. p/p	Description of soils	Numbering of workings										
		Cd-34	Ad-35	Ad-36	Ad-37	Ad-38	Ad-39	Cd-40	Cd-41			
		Depth, m										
1	Soil-vegetative layer	0.0-0.3	-	-	0.0-0.3	0.0-0.3	-	-	0.0-0.3			
2	Bulk soils	-	0.0-0.8	0.0-1.5	-	-	0.0-1.2	0.0-0.5	-			
3	Loams and sandy loams from light to heavy, from gray to gray-fawn in color, from hard to hard-plastic consistency, with layers of silty sand	0.3-2.5	0.8-3.8	1.5-2.8	0.3-3.0	0.3-2.0	1.2-2.5	3.5-4.0	0.3-4.0			
4	Loams and sandy loams, brownish-gray and gray in color, with layers of sand of different grains, from fluid-plastic to fluid consistency	-	3.8-5.0	2.8-5.0	3.0-5.0	-	2.5-5.0	4.0-5.0	4.0-5.0			
5	Sand is gray, different-grained (silty, fine, gravelly, medium-sized and coarse), water-saturated, with layers of sandy loam, in places with sandstone fragments, loose and medium-density.	2.5-5.0	-	-	-	2.0-5.0	-	-	-			
6	Gravel-pebble soils, represented by fragments of sedimentary and metamorphic rocks with sandy-clayey filler, water saturation. The pebbles are well rounded, consisting of igneous and sedimentary rocks.	-	-	-	-	-	-	-	-			
9	Total mine depth, m Cd	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0			
10	Groundwater level, m	3.5	4.0	3.1	3.3	3.8	2.8	4.3	4.2			

Note: Cd - core drilling hole; Ad - auger drilling hole;

Appendix 3

Table of indicators of physical and mechanical properties of clay soils EGE-1

No.	Opening No. No.	Sampling depth, m	Density of soil particles t/m³	Soil density, t/m³		Porosity, %	Porosity factor	Natural moisture, fractional unit	Moisture decree	Characteristic moisture, fractional unit		Number of liquidity index, fractional unit	Liquid factor	Angle of internal friction, degree	Saturation specific cohesion, kPa	Deformation compression module, MPa		Pressure start _ R, MPa	Relative subsidence at P, MPa			
				natural wet	dry					liquid limit	plastic limit					natural _	At saturated		R_b	0.1	0.2	0.3
EGE-1																						
1	Cd-3	1.0	2.69	1.70	1.43	46.8	0.881	18.7	0.57	28.1	19.3	8.8	<0					0,08	0,002	0,012	0,019	0,029
2		2,0	2,70	1,75	1,45	46,3	0,862	20,4	0,64	26,7	20,3	6,4	0,02					0,15	0,003	0,007	0,013	0,017
3	Cd-5	1.0	2.69	1.71	1.43	46.8	0.881	19.4	0.59	27.5	20.1	7.4	<0					0.08	0.002	0.012	0.019	0.029
4		2.0	2.69	1.77	1.46	45.7	0.842	20.9	0.67	26.5	19.4	7,1	0,21					0,16	0,003	0,007	0,012	0,017
5		3,0	2,66	1,81	1,49	44,0	0,785	21,7	0,74	26,2	19,8	6,4	0,30					0,22	0,003	0,005	0,009	0,012
6	Cd-8	1.0	2.68	1.69	1.43	46.6	0.874	18.2	0.56	25.9	20.1	5.8	<0					0.09	0.002	0.011	0.019	0.031
7		2.0	2.68	1.72	1.45	45.9	0.848	18.5	0.58	26.2	19,0	7,2	<0					0,10	0,004	0,010	0,015	0,023
8		3,0	2,70	1,77	1,47	45,6	0,837	20,6	0,66	23,9	17,9	6,0	0,45					0,18	0,004	0,006	0,011	0.014
9	Cd-10	1.0	2.68	1.73	1.45	45.9	0.848	19.3	0.61	27.4	18.2	9.2	0.12					0.16	0.001	0.007	0.012	0.017
10		2.0	2.68	1.80	1.48	44.8	0.811	21.9	0.72	26.9	19.0	7.9	0.37					0.16	0.003	0.007	0.012	0.017
11	Cd-11	1.0	2.69	1.68	1.42	47.2	0.894	18.3	0.55	27.3	21.2	6.1	<0					0.09	0.002	0,011	0,019	0,031
12		2,0	2,70	1,72	1,45	46,3	0,862	18,7	0,59	26,5	18,3	8,2	0,05					0,08	0,005	0,012	0,019	0,029
13		3,0	2,69	1,74	1,46	45,7	0,842	18,9	0.60	25.3	17.4	7.9	0.19					0.10	0.006	0.010	0.015	0.023
14	Cd-13	2.0	2.69	1.68	1.43	46.8	0.881	17.3	0.53	25.8	16.5	9.3	0.09					0.08	0.005	0.012	0.019	0.029
15	Cd-15	1.0	2.68	1.73	1.44	46.3	0.861	20.3	0.63	27.1	18.2	8.9	0.24					0.12	0.002	0.009	0.015	0.020
16		2.0	2.69	1.81	1.48	45.0	0.818	22.6	0.74	27.6	19.4	8.2	0.39					0.16	0.003	0.007	0.012	0.017
17	Cd-17	1.0	2.69	1.63	1.41	47.6	0.908	15.3	0.45	26.7	20.3	6.4	<0					0,09	0,002	0,011	0,019	0,031
18		2,0	2,70	1,67	1,43	47,0	0,888	16,5	0,50	26,7	18,4	8,3	<0					0,08	0,005	0,012	0,019	0,029

19		3,0	2,68	1,71	1,45	45.9	0.848	17.8	0.56	26.3	16.6	9.7	0.12					0.10	0.006	0.010	0.015	0.023
20	Cd-24	1.0	2.68	1.66	1.44	46.3	0.861	15.2	0.47	24.1	16.3	7.8	<0					0.08	0.002	0.012	0.019	0.029
21		2.0	2.70	1.70	1.46	45.9	0.849	16.4	0.52	22.5	15.2	7.3	0.16					0.10	0.004	0.010	0.015	0.023
22	Cd-25	1.0	2.69	1.63	1.41	47.6	0.908	15.3	0.45	28.5	19.2	9.3	<0					0.08	0.002	0.012	0.019	0.029
23	Cd-26	1.0	2.68	1.62	1.42	47.0	0.887	14.3	0.43	23.9	18.2	5.7	<0					0.09	0.002	0.011	0.019	0.031
24	Cd-28	2.0	2.68	1.67	1.44	46.3	0.861	15.7	0.49	22.7	17.6	5.1	<0					0.09	0.004	0.011	0.019	0.031
25	Cd-29	2.0	2.70	1.67	1.43	47.0	0.888	16.5	0.50	25.5	16.8	8.7	<0					0.08	0.005	0.012	0.019	0.029
26		3.0	2.69	1.69	1.44	46.5	0.868	17.3	0.54	26.7	17.1	9.6	0.02					0.08	0.007	0.012	0.019	0.029
27	Cd-32	1.0	2.70	1.64	1.42	47.4	0.901	15.4	0.46	28.1	20.1	8.0	<0					0.08	0.002	0.012	0.019	0,029
28		2,0	2,68	1,66	1,43	46,6	0,874	16,2	0,50	27,8	18,4	9,4	<0					0,08	0,005	0,012	0,019	0,029
29		3,0	2,68	1,69	1,45	45,9	0,848	16,8	0,53	26,3	16.5	9.8	0.03					0.10	0.006	0.010	0.015	0.023
13	Cd-34	1.0	2.69	1.62	1.42	47.2	0.894	14.3	0.43	28.6	21.9	6.7	<0					0.09	0.002	0.011	0.019	0.031
31		2.0	2.70	1.67	1.44	46.7	0.875	16.1	0.50	27.1	19.8	7.3	<0					0.08	0.005	0.012	0.019	0.029
32	Cd-37	1.0	2.68	1.64	1.42	47.0	0.887	15.2	0,46	26,2	18,7	7,5	<0					0,08	0,002	0,012	0,019	0,029
33		2,0	2,70	1,68	1,44	46,7	0,875	16,6	0,51	23,9	17,9	6,0	<0					0,09	0,004	0.011	0.019	0.031
34	SK-40	1.0	2.69	1.64	1.41	47.6	0.908	16.2	0.48	27.3	21.2	6.1	<0					0.09	0.002	0.011	0.019	0.031
35		2.0	2.70	1.68	1.43	47.0	0.888	17,6	0,54	25,5	16,8	8,7	0,09					0,08	0,005	0,012	0,019	0,029
36		3,0	2,69	1,70	1,44	46,5	0,868	18,4	0,57	26,7	17,1	9,6	0,14					0,08	0.007	0.012	0.019	0.029
37	Sk-41	1.0	2.68	1.61	1.41	47.4	0.901	14.2	0.42	26.3	20.6	5.7	<0					0.09	0.002	0.011	0.019	0.031
38		2.0	2.69	1.65	1.43	46.8	0,881	15,6	0,48	25,1	18,2	6,9	<0					0,09	0,004	0,011	0,019	0,031
39		3,0	2,70	1,66	1,42	47,4	0,901	16,9	0,51	24,7	16,4	8,3	0,06					0.08	0.007	0.012	0.019	0.029
Standard values:			**2.69**	**1.69**	**1.44**	**46.5**	**0.869**	**17.6**	**0.55**	**26.2**	**26.2**	**7.7**	**<0**	**25**	**13.0**	**6.5**	**3.0**	**0.10**		**0.010**	**0.017**	**0.026**
Calculated values:				**1.66**										**23**	**8.0**							

at α = 0.85																			
at α = 0.95		**1.63**										**22**	**5.0**						

Appendix 4

Table of indicators of physical and mechanical properties of clay soils EGE-2

No.	Opening No. No.	Sampling depth, m	Density of soil particles t/m^3	Soil density, t/m^3		Porosity, %	Porosity factor	Natural moisture, fractional unit	Moisture decree	Characteristic moisture, fractional unit		Number of liquidity index, fractional unit	Liquid factor	Angle of internal friction, degree	Saturation specific cohesion, kPa	Deformation compression module, MPa		Pressure start _ R, MPa	Relative subsidence at P, MPa			
				natural wet	dry					limit fluid	Plastic limit					natural _	At saturated		R_b	0.1	0.2	0.3
EGE-2																						
1	Cd-3	3,0	2,69	1,88	1,52	43,5	0,770	23,7	0,83	24,8	17,1	7,7	0,86									
2		4,0	2,69	1,89	1,52	43,5	0,770	24,3	0,85	24,6	17,2	7,4	0,96									
3		5,0	2,69	1,91	1,53	43,1	0,758	25,1	0.89	24.5	17.3	7.2	>1.0									
4	Cd-5	4.0	2.69	1.96	1.55	42.4	0.735	26.4	0.97	26.8	19.2	7.6	0.95									
5		5.0	2.69	2.00	1.54	42.8	0.747	30.1	1.08	28.4	21.1	7.3	>1.0									
6	Cd-8	3.0	2.70	2.02	1.55	42.6	0.742	30.2	1.10	24.5	16.7	7.8	>1.0									
7		4.0	2.69	1.95	1.52	43.5	0.770	28.0	0.98	28.3	19.6	8.7	0.97									
8		5.0	2.68	1.91	1.52	43.3	0.763	25.9	0.91	26.3	18.8	7.5	0.95									
9	Cd-10	4.0	2.69	1.92	1.53	43.1	0.758	25.6	0.91	26.7	18.8	7.9	0.86									
10		5.0	2.71	1.96	1.55	42.8	0.748	26.7	0.97	27.1	19.1	8.0	0.95									
11	Cd-15	3.0	2.70	2.00	1.54	43.0	0.753	29.8	1.07	26.7	18.9	7,8	>1.0									
12		4.0	2.70	2.01	1.55	42.6	0.742	29.5	1.07	27.1	18.8	8.3	>1.0									
13	Cd-17	4.0	2.68	1.92	1.52	43.3	0.763	26.0	0.91	25.4	16.8	8.6	>1.0									
14		5.0	2.69	1.92	1.52	43.5	0.770	26.4	0.92	25.3	16.4	8.9	>1.0									
15	Cd-28	3.0	2.69	1.92	1.53	43.1	0.758	25.8	0.92	26.1	16.7	9.4	0.97									
16		4.0	2.70	1.96	1.55	42.6	0.742	26.4	0.96	25.3	16.9	8.4	>1.0									
17	Cd-29	3.0	2.70	2.00	1.54	43.0	0.753	30.1	1.08	26.3	18.8	7.5	>1.0									
18		4.0	2.70	2.02	1.55	42.6	0.742	30.2	1.10	27.6	19.3	8.3	>1.0									

19	Cd-32	4.0	2.70	1.96	1.55	42.6	0.742	26.4	0.96	25.3	16.9	8.4	>1.0								
20		5.0	2.69	1.92	1.51	43.9	0.781	26.9	0.93	23.7	14.8	8.9	>1.0								
21	Cd-37	3.0	2.70	1.87	1.49	44.8	0.812	25.2	0.84	24.6	15.2	9.4	>1.0								
22		4.0	2.68	1.85	1.47	45.1	0.823	26.1	0.85	26.2	17.8	8.4	0.99								
23		5.0	2.68	1.85	1.45	45.9	0.848	27.3	0.86	25.6	19.2	6.4	>1.0								
24	Cd-40	4.0	2.68	1.90	1.47	45.1	0.823	29.2	0.95	23.9	18.1	5.8	>1.0								
25		5.0	2.69	1.89	1.48	45.0	0.818	28.0	0.92	24.2	16.5	7.7	>1.0								
26	Cd-41	4.0	2.69	1.91	1.49	44.6	0.805	28.3	0.95	25.7	17.4	8.3	>1.0								
27		5.0	2.67	1.86	1.44	46.1	0.854	28.9	0.90	25.3	19.5	5.8	>1.0								
Standard values:			**2.69**	**1.93**	**1.52**	**43.6**	**0.774**	**27.3**	**0.95**	**25.8**	**17.9**	**7.9**	**>1.0**	**25**	**17.0**		**4.5**				
Calculated values: at α = 0.85				**1.89**										**24**	**12.0**						
at α = 0.95				**1.87**										**23**	**7.0**						

Table of outcomes of physical and mechanical properties and determination of the granulometric composition of EGE-3 soils

Item no.	Number of opening	Sampling depth, m	ensity of soil particle t/m³	Density soil, t/m³		Porosity, %	Porosity factor	Natural moisture, %	Moisture level	Soil natural fric-tion angle, degree		Internal angle friction, degree	Specific adhesion, kPa	Deformation modulus MPa	Grading %, with fraction diameter - in mm:						Soil name according to GOST 25100 – 2020 (Table B 9)
				naturally moist	dry					dry	under water				>2.0	2.0-1.0	1.0-0.5	0.5-0.25	0.25-0.10	<0.10 Thin	
EGE-3. Sands																					
1	Cd-1	1.0	2.65	1.89	1.49	43.8	0.779	26.8	0.91						10.5	35.0	5.7	25.3	13.3	10.2	Dusty sand
2		2.0	2.65	1.85	1.49	43.8	0.779	24.3	0.83						14.0	24.9	9.9	23.6	17.4	10.2	Dusty sand
3		3.0	2.65	1.85	1.48	44.2	0.791	25.2	0.84						0.9	34.1	17.5	19.7	19.9	7.9	Gravelly sand
4	Cd-10	3.0	2.65	1.88	1.47	44.5	0.803	28	0.92						1.4	3.1	1.1	1.7	77.4	15.3	Dusty sand
5	Cd-11	4.0	2.65	1.87	1.51	43.0	0.755	23.7	0.83						4.7	15.9	19.5	20.5	18.5	20.9	Fine sand
6		5.0	2.65	1.89	1.52	42.6	0.743	24.3	0.87						5.5	20.7	23.0	25.7	12.9	12.2	Dusty sand
7	Cd-13	2.0	2.65	1.86	1.49	43.8	0.779	25.1	0.85						3.4	1.1	3.3	13.0	77.1	2.1	Medium sand
8		3.0	2.65	1.91	1.51	43.0	0.755	26.4	0.93						0.9	2.7	1.9	10.0	78.6	5.9	Medium sand
9		4.0	2.65	1.86	1.43	46.0	0.853	30.1	0.93						0.1	1.9	2.3	9.7	79.0	7.0	Fine sand
10		5.0	2.65	1.94	1.49	43.8	0.779	30.2	>1.0						1.1	8.8	55.0	21.3	9.9	3.9	Fine sand
11	Cd-15	5.0	2.65	1.88	1.52	42.6	0.743	23.8	0.85						10.0	59.0	3.3	8.5	10.2	9.0	Fine sand
12	Cd-19	1.0	2.65	1.91	1.52	42.6	0.743	25.4	0.91						1.9	22.5	15.5	18.8	35.0	6.3	Dusty sand
13		2.0	2.65	1.78	1.42	46.4	0.866	25.6	0.78						6.4	26.9	11.4	17.6	31.6	6.1	Dusty sand
14		3.0	2.65	1.82	1.44	45.7	0.840	26.7	0.84						3.3	14.4	10.4	15.9	30.0	26.0	Fine sand
15		4.0	2.65	2.00	1.54	41.9	0.721	29.8	>1.0						1.2	31.1	10.3	20.3	29.4	7.7	Fine sand
16		5.0	2.65	1.88	1.52	42.6	0.743	23.7	0.84						14.1	52.0	8.8	14.5	4.6	6.0	Fine sand
17	Cd-22	2.0	2.65	1.89	1.52	42.6	0.743	24.3	0.87						14.4	14.9	22.9	25.0	13.6	9.2	Fine sand
18		3.0	2.65	1.91	1.53	42.3	0.732	25.1	0.91						4.7	29.0	8.8	24.0	15.9	17.6	Fine sand
19	Cd-24	3.0	2.65	1.96	1.55	41.5	0.710	26.4	0.99						1.1	16.5	1.5	70.0	4.9	6.0	Fine sand
20		4.0	2.65	2.00	1.54	41.9	0.721	30.1	>1.0						3.9	5.5	11.6	55.0	21.0	3.0	Dusty sand
21		5.0	2.65	2.02	1.55	41.5	0.710	30.2	>1.0						2.1	1.9	1.0	14.0	79.0	2.0	Dusty sand
22	Cd-25	2.0	2.65	1.88	1.52	42.6	0.743	23.8	0.85						0.8	5.4	5.0	2.6	76.0	10.2	Medium sand
23		3.0	2.65	1.91	1.52	42.6	0.743	25.4	0.91						0.9	1.9	2.5	3.7	77.0	14.0	Fine sand
24		4.0	2.65	1.92	1.53	42.3	0.732	25.6	0.93						4.8	24.3	22.9	16.9	23.1	8.0	Dusty sand
25		5.0	2.65	1.96	1.55	41.5	0.710	26.7	1.00						2.8	19.0	20.5	23.6	23.0	11.1	Dusty sand
26	Cd-26	2.0	2.65	2.00	1.54	41.9	0.721	29.8	>1.0						1.1	0.3	1.6	4.0	75.5	17.5	Gravelly sand
27		3.0	2.65	2.01	1.55	41.5	0.710	29.5	>1.0						0.8	1.1	2.4	1.6	75.9	18.2	Fine sand

Item no.	Number of opening	Sampling depth, m	ensity of soil particle t/m³	Density soil, t/m³		Porosity, %	Porosity factor	Natural moisture, %	Moisture level	Soil natural fric-tion angle, degree		Internal angle friction, degree	Specific adhesion, kPa	eformation modulus MPa	Grading %, with fraction diameter - in mm:						Soil name according to GOST 25100 – 2020 (Table B 9)
				naturally moist	dry					dry	under water				>2.0	2.0-1.0	1.0-0.5	0.5-0.25	0.25-0.10	<0.10 Thin	
EGE-3. Sands																					
28		4.0	2.65	1.88	1.52	42.6	0.743	23.7	0.84						1.7	11.0	2.9	55.0	12.5	16.9	Dusty sand
29		5.0	2.65	1.89	1.52	42.6	0.743	24.3	0.87						1.2	0.4	3.0	12.5	79.0	3.9	Dusty sand
30	Cd-28	5.0	2.65	1.91	1.53	42.3	0.732	25.1	0.91						8.9	1.9	55.0	15.1	10.3	8.8	Coarse sand
31	Cd-29	5.0	2.65	1.96	1.55	41.5	0.710	26.4	0.99						56.1	12.3	9.5	7.7	10.4	4.0	Fine sand
32	Cd-34	3.0	2.65	2.00	1.54	41.9	0.721	30.1	>1.0						13.8	13.3	20.1	14.8	23.5	14.5	Dusty sand
33		4.0	2.65	2.02	1.55	41.5	0.710	30.2	>1.0						10.3	4.4	9.6	60.0	12.0	3.7	Dusty sand
34		5.0	2.65	1.96	1.55	41.5	0.710	26.4	0.98						8.5	7.1	12.0	55.9	6.5	10.0	Fine sand
Standart values			**2.65**	**1.92**	**1.51**	**42.8**	**0.750**	**26.5**	**0.94**	**31**	**27**	**32**	**3**	**9.5**	**6.4**	**15.4**	**12.1**	**21.4**	**34.8**	**9.9**	**Dusty sand**
A1 at α=0.85				**1.89**								**30**	**1**								
A2 at α=0.95				**1.87**								**29**	**1**								

Table of granulometric composition of EGE-4 soils

No.	Name of No. opening	Sampling depth selection, m	Fraction size in mm										Amount of fractions, %	Name of soil GOST 25100-2020
			>40	40.0-20.0	20.0-10.0	10.0-5.0	5.0-2.0	2.0-1.0	1.0-0.5	0.5-0.25	0.25-0.1	0.1>		
Content of fractions in %														
1	Cd-1	3.0	34.72	47.7	10.0	1.8	0.45	0.30	0.16	0.21	1.0	3.66	100%	Pebble soil
2		4.0		26.16	19.87	7.05	1.55	0.59	0.34	1.53	20.81	22.1	100%	Gravel
3		5.0		10.90	32.31	21.1	9.52	3.56	1.30	8.33	12.52	0.46	100%	Gravel soil
4	Cd-22	4.0		23.30	22.35	6.78	2.04	0.58	0.2	4.28	17.44	22.96	100%	Gravel soil
5		5.0		26.33	17.68	5.33	2.0	1.06	0.96	14.29	21.02	11.33	100%	Gravel soil

Results of chemical analysis of water extract from soils

No.	Number of opening	Sampling depth soil, m.	Dense residue mg/kg	Ion content, mg/kg						pH	Content gypsum CaSO4x2H2O %
				HCO3-	Cl -	SO 4 - -	CA++	Mg ++	(Na + K)+		
1	C-2	0.0-0.5	9470	170	1090	5220	1260	320	1200	8.1	
2	C-4	0.0-0.5	2040	260	200	920	140	50	420	8.2	
3	C-5	0.0-0.5	4180	150	220	2610	760	170	250	7.9	
4	C-7	0.0-0.5	1330	240	170	490	140	40	210	8.32	
5	C-9	0.0-0.5	17780	200	1550	10560	2260	710	2210	7.9	
6	C-11	0.0-0.5	2740	200	520	1120	380	100	320	8.0	
7	C-12	0.0-0.5	1340	290	180	480	120	60	200	8.5	
8	C-14	0.0-0.5	8820	160	1120	4710	940	430	1140	8.2	
9	C16	0.0-0.5	3620	210	940	1250	300	140	660	8.1	
10	C-18	0.0-0.5	2220	210	450	830	200	80	380	8.24	
11	C-20	0.0-0.5	16690	180	3490	7760	1440	1040	2420	8.1	
12	C-21	0.0-0.5	3121	512	702	897	190	162	554	8.1	
13	C-23	0.0-0.5	3431	592	502	1329	300	192	477	8.0	
14	C-27	0.0-0.5	3439	421	426	1572	290	222	435	8.0	
15	C-29	0.0-0.5	4618	366	585	2250	380	276	637	7.7	
16	S-30	0.0-0.5	3022	427	435	1255	270	180	394	8.0	
17	C-31	0.0-0.5	2369	476	326	893	220	132	316	7,8	
18	C-33	0.0-0.5	2935	561	368	1177	220	180	421	7.9	
19	S-35	0.0-0.5	1913	445	251	658	220	90	223	7.9	
20	C-36	0.0-0.5	3495	415	460	1572	380	186	419	7.9	
21	S-39	0.0-0.5	2715	421	485	1000	310	186	244	7.8	

TABLE OF RESULTS OF GROUND WATER CHEMICAL ANALYSIS

No.	Place of taking samples	Sampling depth, *m.*	Dry residue, *mg/l*	Ion content, *mg/l* *mg- eq /l*						**pH**	Hardness, *mg- eq /l*		
				NSO_3^-	**Cl^-**	**SO_4^{--}**	**CA^{++}**	**Mg^{++}**	**$(Na+K)^+$**		General	Removable	Constant
1	S-1	1.3	9595	305	1765	4392	500	420	1990	8.2	58.7	5.0	53.7
2	C-2	2.5	9825	165	1649	4455	464	427	1923	8.1	58.5	2.7	55.8
3	C-4	3.2	8380	494	1359	3719	528	370	1544	8.4	57.0	8.1	48.9
4	C-5	4.2	18068	215	4795	6817	610	720	4393	7.6	89.65	3.5	86,13
5	C-6	1.8	7560	165	1301	3476	492	346	1353	8.2	53.2	2.7	5.05
6	C-7	3.8	17730	295	4620	6735	620	695	4304	7.7	88.17	4.8	83.35
7	C-8	2.8	7910	345	1352	3606	496	370	1465	8.4	55.4	5.7	49.7
8	C-9	3.3	7885	186	1340	3645	480	355	1465	8.3	53.4	3.1	50.3
9	C-10	2,3	7790	159	1314	3733	508	348	1454	8.2	54.1	2.6	51.5
10	C-11	3.8	4875	171	1333	3736	508	348	1477	8.2	54.1	2.8	51.3
11	C-12	4.0	9690	500	1771	4196	492	434	1957	8.2	60.5	8.2	52.3
12	C-14	3.5	2920	567	406	1164	250	192	384	7,8	28,26	9.24	18.97
13	C-16	3.7	2780	494	378	1119	330	174	259	7.5	30.78	8,10	22.68

No.	Place of taking samples	Sampling depth, *m.*	Dry residue, *mg/l*	Ion content, *mg/l* *mg- eq /l*						**pH**	Hardness, *mg- eq /l*		
				NSO_3^-	**Cl^-**	**SO_4^{--}**	**CA^{++}**	**Mg^{++}**	**$(Na+K)^+$**		General	Removable	Constant
14	C-20	2.8	2530	494	343	1008	300	144	275	7.6	26.81	8,10	18.71
15	C-23	3.0	4340	537	721	1855	340	318	566	7,8	43.12	8.80	34,32
16	C-27	2.7	3390	567	413	1493	320	210	432	7,8	33,24	9.29	23.95
17	C-29	3.3	2950	366	434	1345	290	192	367	7.7	30,26	6.00	24,26
18	C-32	4.4	4220	659	511	1534	350	220	493	7.4	35.71	10.80	24.91
19	C-36	3.1	5090	525	826	2234	450	360	606	7.7	52.06	8.60	43,46
20	C-39	2.8	3000	409	364	1123	300	174	254	7.7	29.28	6.70	22.58
21	S-41	4.2	3440	592	553	1440	250	258	496	8.1	33.69	9.70	23.99

Table
of Standard Penetration Test
(SPT)

Table
standard penetration test results / SPT -TEST /

No.	No. of opening	Probing depth, m	SPT test during penetration			blow count $T_1 + T_2$	failure
			installation penetration	main penetration			
			S1	T1	T2		
			15. 0 mm	15.0 mm _	15.0 mm _		
C to -1							
1	-*-	1.5-1.95	5	6	7	13	
2	-*-	3.0-3.45	6	9	9	18	
3	-*-	4.5-4.95	5	10	15	25	

Table
standard penetration test results / SPT -TEST /

No.	No. of opening	Probing depth, m	SPT test during penetration			blow count $T_1 + T_2$	failure
			installation penetration	main penetration			
			S1	T1	T2		
			15. 0 mm	15.0 mm _	15.0 mm _		
C to - 3							
1	-*-	1.5-1.95	3	4	4	8	
2	-*-	3.0-3.45	5	5	7	12	
3	-*-	4.5-4.95	7	9	11	20	

Table
standard penetration test results / SPT -TEST /

No.	No. of opening	Probing depth, m	SPT test during penetration			blow count $T_1 + T_2$	failure
			installation penetration	main penetration			
			S1	T1	T2		
			15. 0 mm	15.0 mm _	15.0 mm _		
C to - 8							
1	-*-	1.5-1.95	3	3	5	8	
2	-*-	3.0-3.45	3	5	5	10	
3	-*-	4.5-4.95	5	5	7	12	

Table
standard penetration test results / SPT -TEST /

No.	No. of opening	Probing depth, m	SPT test during penetration			blow count $T_1 + T_2$	failure
			installation penetration	main penetration			
			S1	T1	T2		
			15. 0 mm	15.0 mm _	15.0 mm _		
C to -1 0							
1	-*-	1.5-1.95	3	3	4	7	
2	-*-	3.0-3.45	3	5	4	9	
3	-*-	4.5-4.95	5	7	8	15	

Table
standard penetration test results / SPT -TEST /

No.	No. of opening	Probing depth, m	SPT test during penetration			blow count $T_1 + T_2$	failure
			installation penetration	main penetration			
			S1	T1	T2		
			15. 0 mm	15.0 mm _	15.0 mm _		
C to -1 1							
1	-*-	1.5-1.95	2	5	4	9	
2	-*-	3.0-3.45	6	5	7	12	
3	-*-	4.5-4.95	4	5	9	14	

Table
standard penetration test results / SPT -TEST /

No.	No. of opening	Probing depth, m	SPT test during penetration			blow count $T_1 + T_2$	failure
			installation penetration	main penetration			
			S1	T1	T2		
			15. 0 mm	15.0 mm _	15.0 mm _		
C to -1 3							
1	-*-	1.5-1.95	4	3	4	7	
2	-*-	3.0-3.45	5	7	7	14	
3	-*-	4.5-4.95	8	9	12	21	

Table
dynamic probing test results / SPT -TEST /

No.	No. of opening	Probing depth, m	SPT test during penetration			blow count $T_1 + T_2$	failure
			installation penetration	main penetration			
			S1	T1	T2		
			15. 0 mm	15.0 mm _	15.0 mm _		
C to -1 7							
1	-*-	1.5-1.95	2	5	5	10	
2	-*-	3.0-3.45	4	6	8	14	

No.	No. of opening	Probing depth, m	SPT test during penetration			blow count $T_1 + T_2$	failure
			installation penetration	main penetration			
			S1	T1	T2		
			15. 0 mm	15.0 mm _	15.0 mm _		
3	-*-	4.5-4.95	6	8	9	17	

Table
dynamic probing test results / SPT -TEST /

No.	No. production	Probing depth, m	SPT test during penetration			blow count $T_1 + T_2$	failure
			installation penetration	main penetration			
			S1	T1	T2		
			15. 0 mm	15.0 mm _	15.0 mm _		
C to -1 9							
1	-*-	1.5-1.95	4	6	6	12	
2	-*-	3.0-3.45	7	9	12	21	
3	-*-	4.5-4.95	5	8	7	15	

Table
dynamic probing test results / SPT -TEST /

No.	No. of opening	Probing depth, m	SPT test during penetration			blow count $T_1 + T_2$	failure
			installation penetration	main penetration			
			S1	T1	T2		
			15. 0 mm	15.0 mm _	15.0 mm _		
C to - 22							
1	-*-	1.5-1.95	3	5	8	13	
2	-*-	3.0-3.45	5	9	13	22	
3	-*-	4.5-4.95	7	10	12	22	

Table
dynamic probing test results / SPT -TEST /

No.	No. of opening	Probing depth, m	SPT test during penetration			blow count $T_1 + T_2$	failure
			installation penetration	main penetration			
			S1	T1	T2		
			15. 0 mm	15.0 mm _	15.0 mm _		
C to - 25							
1	-*-	1.5-1.95	3	5	6	11	
2	-*-	3.0-3.45	13	16	19	35	
3	-*-	4.5-4.95	18	23	27	30	

Table
dynamic probing test results / SPT -TEST /

No.	No. of opening	Probing depth, m	SPT test during penetration			blow count $T_1 + T_2$	failure
			installation penetration	main penetration			
			S1	T1	T2		
			15. 0 mm	15.0 mm _	15.0 mm _		
C to - 26							
1	-*-	1.5-1.95	3	5	7	12	
2	-*-	3.0-3.45	5	9	13	22	
3	-*-	4.5-4.95	8	10	15	25	

Table
dynamic probing test results / SPT -TEST /

No.	No. of opening	Probing depth, m	SPT test during penetration			blow count $T_1 + T_2$	failure
			installation penetration	main penetration			
			S1	T1	T2		
			15. 0 mm	15.0 mm _	15.0 mm _		
C to - 29							
1	-*-	1.5-1.95	3	6	7	13	
2	-*-	3.0-3.45	5	9	eleven	20	
3	-*-	4.5-4.95	7	8	13	21	

Table
dynamic probing test results / SPT -TEST /

No.	No. of opening	Probing depth, m	SPT test during penetration			blow count $T_1 + T_2$	failure
			installation penetration	main penetration			
			S1	T1	T2		
			15. 0 mm	15.0 mm _	15.0 mm _		
C to - 32							
1	-*-	1.5-1.95	3	6	8	14	
2	-*-	3.0-3.45	5	9	14	23	
3	-*-	4.5-4.95	10	13	16	29	

Table
dynamic probing test results / SPT -TEST /

No.	No. of opening	Probing depth, m	SPT test during penetration			blow count $T_1 + T_2$	failure
			installation penetration	main penetration			
			S1	T1	T2		
			15. 0 mm	15.0 mm _	15.0 mm _		
C to - 34							
1	-*-	1.5-1.95	4	6	7	13	
2	-*-	3.0-3.45	10	13	18	31	
3	-*-	4.5-4.95	17	31	19	50	8cm

Table
dynamic probing test results / SPT -TEST /

No.	No. of opening	Probing depth, m	SPT test during penetration			blow count $T_1 + T_2$	failure
			installation penetration	main penetration			
			S1	T1	T2		
			15. 0 mm	15.0 mm _	15.0 mm _		
C to - 37							
1	-*-	1.5-1.95	2	7	7	14	
2	-*-	3.0-3.45	5	9	16	25	
3	-*-	4.5-4.95	9	13	18	31	

Table
dynamic probing test results / SPT -TEST /

No.	No. of opening	Probing depth, m	SPT test during penetration			blow count $T_1 + T_2$	failure
			installation penetration	main penetration			
			S1	T1	T2		
			15. 0 mm	15.0 mm _	15.0 mm _		
C to - 40							
1	-*-	1.5-1.95	2	7	6	14	
2	-*-	3.0-3.45	5	12	17	29	
3	-*-	4.5-4.95	9	13	15	28	

Table
dynamic probing test results / SPT -TEST /

No.	No. of opening	Probing depth, m	SPT test during penetration			blow count $T_1 + T_2$	failure
			installation penetration	main penetration			
			S1	T1	T2		
			15. 0 mm	15.0 mm _	15.0 mm _		
C to - 4 1							
1	-*-	1.5-1.95	5	8	7	15	
2	-*-	3.0-3.45	6	13	19	32	
3	-*-	4.5-4.95	7	eleven	23	34	

ANNEX 2 – THE POSITIVE CONCLUSION OF THE STATE ECOLOGICAL EXPERTISE

Berilgan xulosa reestrda ko‘rinmasa haqiqiy hisoblanmaydi

O‘ZBEKISTON RESPUBLIKASI EKOLOGIYA, ATROF-MUHITNI MUHOFAZA QILISH VA IQLIM O‘ZGARISHI VAZIRLIGI
DAVLAT EKOLOGIK EKSPERTIZASI MARKAZI
BUXORO VILOYAT FILIALI

200100 Buxoro sh. Ibn Sino ko’ch, 206-uy Tel: (55) 304-07-42

DAVLAT EKOLOGIK EKSPERTIZASI XULOSASI

TARTIB RAQAM : Э-7-770з

HUJJAT TURI : Atrof-muhitga ta'sir to'g'risidagi ariza loyihasi

Davlat ekologik ekspertizasi buyurtmachisi: "ENGINEERING ASIA GROUP" MAS'ULIYATI CHEKLANGAN JAMIYAT **ga berildi.**
STIR: 206198234
Davlat ekologik ekspertizasi obyekti: Buxoro viloyati Romitan tumani **da joylashgan**
Loyiha ishlab chiquvchi nomi: OOO "ENGINEERING ASIA GROUP MCHJ"
STIR: 206198234
Davlat ekologik ekspertizasi mas’ul eksperti: Vosiyev Suxrob Sanoqulovich

O‘zbekiston Respublikasi Vazirlar Mahkamasining 2020-yil 7-sentabrdagi 541-son qarori bilan tasdiqlangan 1-ilovaga muvofiq, ushbu davlat ekologik ekspertizasi obyekti **atrof-muhitga ta’sir ko‘rsatishning 3-Toifa 15 bandiga mansub.**

O‘tkazilgan davlat ekologik ekspertizasi natijasi: **Ijobiy xulosa**

Davlat ekologik ekspertizasi xulosasining matnli ilovasi: 5 varaqda

Davlat ekologik ekspertizasi xulosasi:

Berilgan sana : 17.10.2023

Amal qilish muddati : 17.10.2026

*Ekologik ekspertiza obyektining ekologik talablarga muvofiqligi, joylashuv nuqtalari koordinatalari, atrof-muhitni muhofaza qilish chora-tadbirlari, bajarilishi shart bo‘lgan talablar va boshqalar to‘g‘risida ilovada keltirilgan O‘zbekiston Respublikasi ekologiya, atrof-muhitni muhofaza qilish va iqlim o‘zgarishi vazirligining Davlat ekologik ekspertiza markazi va filiallarining ekspert xulosasi ushbu davlat ekologik ekspertizasi xulosasining **ajralmas qismi hamda unda belgilangan talablar** bajarilishi shart hisoblanadi.*

Izoh: Buyurtmachi tomonidan davlat ekologik ekspertizasi xulosasida nazarda tutilgan ekologik talablarga rioya etilmaganda, davlat ekologik ekspertizasi xulosasi qonunchilikda belgilangan tartibda bekor qilinadi.

Direktor
M.G.Maxmudov

Номер специальной формы :

Berilgan xulosa reestrda ko'rinmasa haqiqiy hisoblanmaydi

Давлат экологик экспертизаси хулосасига илова

Государственная экологическая экспертиза
Экспертное заключение

Объект:	Оценка воздействия на окружающую среду (ПЗВОС) развитие и модернизация систем канализации и очистных сооружений Ромита
Заказчик:	ООО "ENGINEERING ASIA GROUP"
ИНН	206198234
Категория	3 категория (15 пункт, ПКМ РУз № 541 от 07.09.2020 г.)
Разработчик:	ООО "ENGINEERING ASIA GROUP"
Эксперт:	Восиев Сухроб Санокулович

На Бухарский областной филиал государственного учреждения «Центр государственной экологической экспертизы» представлены материалы первого этапа оценки воздействия на окружающую среду «Развитие и модернизация систем канализации и очистных сооружений», расположенных на территории г. Ромитан, Бухарской области. Бухарская область расположена в Юго-Западной части Узбекистана и занимает площадь-41,87 тыс.кв.км. В состав области входят 11 административных районов. В области 2 города и 3 городские поселки. Численность населения по состоянию на 01.01.2023 год 2,13 тыс. человек, в том числе городского-444,0 тыс.чел. и сельского 936,0 тыс.чел. Цель работы заключается в оценке воздействия на окружающую среду «Развитие и модернизация систем канализации и очистных сооружений», расположенных на территории Ромитанского района, Бухарской области.

Основанием для реализации проекта является Постановление Кабинета Министров Республики Узбекистан, от 21.09.2019 г. № 794 «О мерах по комплексному социально-экономическому развитию Бухарской области в период 2019—2023 годов». Постановление Президента №3857 от 16.07.2018. Строительство системы канализации г.Ромитан, Бухарской области вызвано необходимостью решения проблемы водоотведения и очистки сточных вод г.Ромитан. Основной целью проектных решений является улучшение экологической и санитарно-эпидемиологической ситуации, здоровья и жизненных условий людей, проживающих в г.Ромитан. Осуществление строительства системы канализации позволит решить проблему с очисткой стоков и обработкой осадков на очистных сооружениях с доведением качества очищенных сточных вод до нормативных требований. Работа систем водоотведения будет достигнута путем: строительства канализационных очистных сооружений производительностью 5,045 тыс.м3/сут. Строительства канализационных насосных станций, строительства канализационных сетей и коллекторов с целью охвата населения услугами канализации. В систему канализации принимаются хозяйственно-фекальные стоки от населения, общественных и коммунальных учреждений, хозяйственно-бытовые и производственные стоки промышленных предприятий г.Ромитан, Бухарской области.

В процессе строительства систем канализации будет происходить выброс загрязняющих веществ в атмосферный воздух, образование отходов производства и потребления.

Проект ЗВОС выполнен в соответствии с требованиями Закона «Об экологической экспертизе» и Постановления Кабинета Министров Республики Узбекистан № 541 от 07.09.2020 г. Предприятие относится к III категории экологической опасности (п.15-Канализационные очистные сооружения производительностью менее 50 тыс. куб. м/сутки).

Рассматриваемая площадка, предназначенная под строительство систем канализационных сетей и очистных сооружений для жилых домов в г.Ромитан, расположена на территории Ромитанского района Бухарской области. Численность населения составляет 15,200 тыс.чел. В настоящее время централизованной канализации в г.Ромитан нет. Городская больница имеет ведомственные очистные сооружения, которые расположены в южной части города. Все население пользуется локальными санитарными системами, имеющимися на их придомовых участках, такими как выгребные ямы и септики.

Срок строительства составит 12 месяцев. Ближайшие жилые дома г.Ромитан, расположены более 600 м с западной стороны от планируемой территории КОС. Сброс стоков с КОС будет осуществляться в Центральный Бухарский коллектор который протекает на расстоянии 100 метров. **Координаты КОС:** 39°53'23.47"С 64°20’11.05"В

Проектируемая система канализации города принята неполная раздельная. Данная система канализования предусматривает схему канализационных коллекторов, сетей и насосных станций для отвода бытовых сточных вод и загрязненных производственных вод, допускаемых к спуску в бытовую канализацию, от объектов канализования на канализационные очистные сооружения. Условно-чистые производственные воды в канализацию города не принимаются, а после локальной очистки используются на полив территории, мойку машин и оборотное водоснабжение. Атмосферные осадки отводятся через ирригационную сеть.

Трассировка и расчет канализационной сети произведены с учетом пропускной способности канализационных коллекторов, рельефа местности, распределения населения и промпредприятий по территории города. Для канализационной самотечной сети предусмотрены трубы d=200-600 мм, для напорная трубы d=200-300 мм. Проектируемые канализационные коллекторы выполняются из неметаллических канализационных труб, которые не подвергаются коррозии и имеют долгий срок эксплуатации. По трассе коллекторов предусматривается устройство колодцев для осмотра и очистки, из сборного или монолитного железобетона. Глубина заложения сети 1,8-4,5 м. На участках прокладки в водонасыщенных грунтах трубы укладываются на искусственное основание с мерами водопонижения.

Переходы трубопроводов через водные преграды, автомобильные дороги и железнодорожные пути следует предусматривать в кожухах. Проектируемые очистные сооружения канализационных сточных вод включают:-приемную камеру поступающей воды включающий механическую очистку–решетки и мацераторы которые располагаются в приемной камере; -резервуар-усреднитель с системой распределения и перемешивания поступающих стоков, циркуляционными и подающими на биологическую очистку насосами.

Учитывая высокие требования к сбросам в поверхностный водоем согласно проекта процесс очистки сточных вод, заключается в измельчение механических включений (гомогенизация)-механическая очистка с использованием мацераторов с последующим улавливание тяжелых минеральных веществ, главным образом, песка и взвешенных веществ. Далее сточные воды подвергаются биологической очистке в вертикальных биореакторах и биореакторах-илоотделителях в несколько ступеней в зависимости от состава исходных стоков. После прохождения биологической очистки стоки подлежат глубокой доочистка при помощи блока доочистки с применением биологической фильтрации с последующим извлечением биогенных веществ в виде азота и фосфора на ступени биологической очистки. На завершающей стадии очищенная вода подлежит дезинфекции с дальнейшим сбросом воды в ирригационный коллектор. Образующиеся иловые осадки планируется использовать в качестве удобрений при выращивании агрокультур.

При эксплуатации очистных сооружений, построенных в Ромитан, степень очистки сточных вод достигнет требований, предъявляемым к водоемам рыбохозяйственного назначения.

Анализ представленных материалов показал, что воздействие на окружающую среду будет не значительным и в период строительных работ. В период строительных работ прогнозируются выбросы загрязняющих веществ в атмосферный воздух от строительно-монтажных работ в общем количестве 9,67 тонн. Выбросы при производстве строительно-монтажных работ осуществляются только в течение срока строительства и не участвуют в формировании фоновых концентраций.

Водопотребление для рабочих за счет привозной воды в количестве 150,1125м3. Хозяйственно-бытовые стоки предусматривается в гидроизолированные выгреба.

В процессе строительства прогнозируется образование строительных отходов в виде лома черных металлов, обломков строительного кирпича и т.п. Указанные отходы по окончании строительства и реконструкции будут утилизированы с принятыми стандартами и нормами в Узбекистане.

Следующим этапом экологического сопровождения проекта модернизация систем канализации и очистных сооружений Ромитанского района следует разработать Заявление об экологических последствиях, в котором необходимо:

-привести качественную и количественную характеристику ирригационного коллектора, принимающего очищенные сточные воды;

-пронормировать выбросы и сбросы загрязняющих веществ в окружающую среду, образование и размещение отходов.

Рассмотрев представленные материалы, Бухарский областной филиал государственного учреждения «Центр государственной экологической экспертизы» ***согласовывает*** развитие и модернизация систем канализации и очистных сооружений Ромитанского района Бухарской области.

Предприятию ООО « БУХОРО СУВ ТАЪМИНОТИ » необходимо:

Следующим этапом следует разработать проект заявление об экологических последствиях (ЗЭП) и представить на государственную экологическую экспертизу до ввода предприятия в эксплуатацию в установленном законодательством порядке с уточнением количественных и качественных характеристик по выбросам, сбросам загрязняющих веществ в природную среду, образования и размещения отходов производства и потребления.

***Обеспечить сохранение существующих на территории древесных насаждений в соответствии с Указом Президента РУз №5863 от 30.10.2019 г. «Об утверждении Концепции охраны окружающей среды Республики Узбекистан до 2030 год*а»,**

В случае необходимости пересадки какого-либо дерева при проведении строительных работ, заказчик должен обратиться в Центр государственных услуг за разрешением на вырубку деревьев в соответствии с Постановлением Кабинета Министров Республики Узбекистан от 31 марта 2018 года No 255.

В случае незаконной вырубки деревьев заказчик должен быть привлечен к ответственности в соответствии с действующим законодательством.

Своевременно выполнять предусмотренные мероприятия по технической рекультивации нарушенных земель.

Полностью соблюдать требования главы 5 статьи 16 (Условия использования природных ресурсов) и главы 10 статьи 45 (Охрана природы от загрязнения отходами) Закона Республики Узбекистан «Об охране природы».

Заключение государственной экологической экспертизы о соответствии объекта государственной экологической экспертизы экологическим требованиям **имеет юридическую силу в течение трех лет со дня его выдачи.**

Контроль над соблюдением требований природоохранного законодательства на предприятии возлагается Ромитанскому районному инспекции по экологии, охране окружающей среды и изменения климата Бухарского управления.

Не следует допускать ввода в эксплуатацию данного объекта без положительного заключения на заявление об экологических последствиях.

Директор филиала **М.Махмудов**

Масъул давлат экологик экспертиза эксперти: Vosiyev Suxrob Sanoqulovich
Тел: +998 71 203 00 22 (1022)

МИНИСТЕРСТВО ЭКОЛОГИИ, ОХРАНЫ ОКРУЖАЮЩЕЙ СРЕДЫ И ИЗМЕНЕНИЯ КЛИМАТА РЕСПУБЛИКИ УЗБЕКИСТАН
ЦЕНТР ГОСУДАРСТВЕННОЙ ЭКОЛОГИЧЕСКОЙ ЭКСПЕРТИЗЫ
БУХАРСКИЙ ОБЛАСТНОЙ ФИЛИАЛ

ЗАКЛЮЧЕНИЕ ГОСУДАРСТВЕННОЙ ЭКОЛОГИЧЕСКОЙ ЭКСПЕРТИЗЫ

Порядковый номер: Э-7-770з

Тип документа: Проект заявления о воздействии на окружающую среду

Заказчик государственной экологической экспертизы: выдано ООО Engineering Asia Group

ИНН: 206198234

Объект государственной экологической экспертизы: находится в Рамитанском районе Бухарской области

Разработчик проекта : ООО "Engineering Asia Group"

ИНН: 206198234

Эксперт по государственной экоэкспертизе: Восиев Сухроб Санокулович

Согласно Приложению 1, утвержденному постановлением Кабинета Министров Республики Узбекистан № 541 от 7 сентября 2020 года, данный объект государственной экологической экспертизы **по воздействию на окружающую среду относится к 3-категории 15-пункт.**

Результат проведенной государственной экологической экспертизы:

Положительное заключение

Текстовое приложение заключения государственной экологической экспертизы: на 5 листах

Дата выдачи заключения государственной экологической экспертизы: 17.10.2023 г.

Срой действия заключения государственной экологической экспертизы: до 17.10.2026 г.

Приводимое в приложении к Экспертному заключению Центра и филиалов Государственной экологической экспертизы Министерства экологии, охраны окружающей среды и изменения климата Республики Узбекистан данные о соответствии объекта экологической экспертизы экологическим требованиям, координатах точек расположения, мерах по охране окружающей среды, требованиях, которые должны быть выполнены и т.д., является неотъемлемой частью настоящего заключения государственной экологической экспертизы, а определенные в нем требования считаются обязательными для выполнения.

***Примечание**: **при несоблюдении заказчиком экологических требований, предусмотренных в заключении государственной экологической экспертизы, заключение государственной экологической экспертизы аннулируется в порядке, установленном законодательством**.*

Директор М.Г. Махмудов

MINISTRY OF ECOLOGY AND ENVIRONMENTAL PROTECTION
AND CLIMATE CHANGE OF THE REPUBLIC OF UZBEKISTAN
CENTER FOR STATE ENVIRONMENTAL EXPERTISE
BUKHARA REGIONAL BRANCH

CONCLUSION OF THE STATE ENVIRONMENTAL EXPERTISE

Serial number: Э-7-770з

Document Type: Draft Environmental Impact Statement

State Environmental Expertise Client: issued to Engineering Asia Group LLC

Taxpayer Identification Number (TIN): 206198234

Object of state environmental expertise: located in the Romitan district of the Bukhara region

Project developer: "Engineering Asia Group" LLC

Taxpayer Identification Number: 206198234

State environmental appraisal expert: Vosiyev Sukhrob Sanokulovich

According to Appendix 1, approved by the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 541 dated September 7, 2020, this object of state environmental expertise belongs to **Environmental Impact Category 3, Paragraph 15.**

The result of the state environmental expertise: **Positive conclusion**

The Text appendix to the conclusion of the state environmental expertise: on 5 sheets

Date of issue of the conclusion of the state environmental expertise: 17.10.2023

Conclusion of the state environmental expertise is valid until: 17.10.2026

The data on the compliance of the object of environmental expertise with environmental requirements, the coordinates of its location points, environmental protection measures, requirements to be met, etc., given *in the appendix* to the Expert Conclusion of the Center and branches for *State Environmental Expertise* of the Ministry of Ecology, Environmental *Protection and Climate Change of the Republic of Uzbekistan, is an integral part* of *this conclusion of the state environmental expertise, and the requirements adduced in it are mandatory.*

Note: if the client fails to comply with the environmental requirements provided for in the conclusion of the state environmental expertise, the conclusion of the state environmental expertise is canceled in accordance with the procedure established by law.

Director M.G. Makhmudov

State Environmental Impact Expertise

Expert Conclusion

Object: Draft Environmental Impact Statement (DEIS), development and modernization of sewerage systems and treatment facilities in Romitan district of Bukhara region

Client: "Engineering Asia Group" LLC

TIN 206198234

Category Category 3 (Paragraph 15, Cabinet of Ministers of the Republic of Uzbekistan No. 541 dated 07.09.2020)

Developer: "Engineering Asia Group" LLC

Expert: Vosiyev Sukhrob Sanokulovich

The materials of the first stage of the environmental impact assessment for development and modernization of sewerage systems and treatment facilities of the Romitan district of the Bukhara region were presented to the Bukhara regional branch of the Center for State Environmental Expertise.

Bukhara region is located in the southwestern part of Uzbekistan and covers an area of 41.87 thousand square kilometers. The region includes 11 administrative districts. There are 2 cities and 3 urban settlements in the region. The population as of 01.01.2022 is 2.13 thousand people, including urban population of 444.0 thousand people. and rural population of 936.0 thousand people.

The purpose of the work is to assess the impact on the environment of "Development and modernization of sewerage systems and treatment facilities" located in the territory of the Romitan district, Bukhara region.

The basis for the implementation of the project is the Resolution of Cabinet of Ministers No. 794 dd 21.09.2019 “On measures for integrated socio-economic development of Bukhara Region for 2019-2023” and Decree of the President of the Republic of Uzbekistan No. 3857 dated 16.07.2018.

The construction of the sewerage system in Romitan, Bukhara region is informed by the need to solve the problems of wastewater disposal and wastewater treatment.in Romitan. The main purpose of the project solutions is to improve the environmental and sanitary-epidemiological situation, health and living conditions of people living in Romitan. The construction of a sewerage system will solve the problem of wastewater treatment and precipitation treatment at a wastewater treatment plant with the quality of treated wastewater up to regulatory requirements. The work of wastewater treatment systems will be achieved by: construction of a wastewater treatment plant with a capacity of 5,045 thousand m3/day. Construction of sewage pumping stations, construction of sewer networks in order to provide the population with sewerage services. The sewage system receives domestic and fecal wastewater from the population, public and communal institutions, household and industrial wastewater from industrial enterprises in Romitan, Bukhara region.

During the construction of sewage systems, pollutants will be released into the air, industrial and domestic waste will be generated.

The project is implemented in accordance with the requirements of the Law "On Environmental Expertise" and Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 541 dated 07.09.2020. The plant belongs to the environmental hazard category 3 (Paragraph 15-wasetwater treatment plants with a capacity of less than 50 thousand cubic meters/day).

The site under consideration intended for the construction of sewerage systems and a wastewater treatment plant for residential buildings in Romitan is located in Romitan district, Bukhara region.

The population is 15.200 thousand people. At present, there is practically no centralized sewerage system in Romitan city. The city hospital has its own treatment facilities located in the south of the city. The entire population use local sanitation systems available in their local areas, such as cesspools and septic tanks.

The project provides for the construction of a system of sewage treatment facilities with a capacity of 5277 m^3/day and networks with a length of 152.4 km, 14 new pumping stations, including a main sewage pumping station, and 9800 house connections.

The construction period will last 12 months. The nearest residential buildings are located at a distance of more than 600 m to the west from the planned WWTP site. It is planned to discharge wastewater into the Central Bukhara Channel, located at a distance of 100 m from the site.

WWTP bearings are 39°53'23.47"N 64°20’11.05"E

The projected city sewerage system adopted if of an incomplete, separate type. This sewerage system provides for a system of sewers, networks and pumping stations for the disposal of domestic wastewater and polluted production water permitted to discharge into the domestic sewerage system from sewerage facilities to the wastewater treatment plant. Provisionally clean industrial water is not accepted into the city sewerage system, and after local treatment it is used to irrigate the area, car wash and recycled water supply. Precipitation is drained through the irrigation network.

Routing and calculation of the sewer network were made taking into account the capacity of sewers, the terrain, the distribution of the population and industrial enterprises throughout the city. For the sewer gravity network, pipes d = 200-600 mm are provided, for forced one pipe d = 200-300 mm. They are corrosion resistant and have a long service life. Along the route of collectors, it is planned to install manholes for inspection and cleaning, made of prefabricated or monolithic reinforced concrete. The depth of the network is 1.8-4.5 m.

Pipeline crossings over water barriers, roads and railways should be provided in casings.

The projected wastewater treatment plant includes:

- an inlet chamber for influent, including mechanical cleaning - screens and macerators (grease traps), which are located in the inlet chamber;
- an equalizing tank with a system for distributing and mixing incoming wastewater, circulating and supplying pumps to biological treatment;

Taking into account the stringent requirements for discharged effluents into the surface water body, according to the project, the wastewater treatment process consists in the grinding of mechanical inclusions (homogenization), mechanical treatment using macerators, followed by the capture of heavy minerals, mainly sand and suspended solids. Further, wastewater undergoes biological treatment in vertical bioreactors and bioreactors-sludge separators in several stages, depending on the composition of the influents. After undergoing biological treatment, the wastewater goes through deep tertiary treatment using a tertiary treatment unit using biological filtration, followed by the extraction of nutrients in the form of nitrogen and phosphorus at the biological treatment stage. At the final stage, the purified water goes through the process of disinfection with further discharge of water into the irrigation collector canal. The resulting sludge is to be used as fertilizer in the cultivation of agricultural crops.

During the operation of the treatment facilities built in Romitan, the degree of wastewater treatment will reach the requirements for fishery reservoirs.

An analysis of the submitted materials showed that the impact on the environment will not be significant even during the construction period. During the construction period, emissions of pollutants into the air from construction and installation works in the total amount of 9.67 tons are predicted. Emissions from construction and installation works are carried out only during the construction period and do not contribute to the formation of background concentrations.

Water consumption for workers is provided in the form of imported water in the amount of 150.1125 m^3. Domestic wastewater is flown into waterproofed cesspools.

During the construction process, the formation of construction waste in the form of ferrous scrap, fragments of building bricks, etc., is expected.

The next stage of environmental assistance of the project of the modernization of sewerage systems and treatment facilities of the Romitan district is to develop a Statement of Environmental Effects, which should:

- **provide a qualitative and quantitative description (characteristics) of the irrigation collector that receives treated wastewater (effluent);**
- **provide standards for emissions and discharges of pollutants into the environment, the formation and disposal of waste.**

Having reviewed the submitted materials, the Bukhara regional branch of the State Environmental Expertise approves the development and modernization of sewerage systems and treatment facilities in the Romitan district of the Bukhara region.

The "BUKHORO SUV TAMINOTI" LLC must:

As a next step develop a draft statement of environmental effects (SEE) and submit it to the state environmental expertise before commissioning the plant in accordance with the procedure established by law, specifying the quantitative and qualitative characteristics of emissions, discharges of pollutants into the environment, generation and disposal of production and consumption waste.

Ensure the preservation of existing tree plantations on the territory in accordance with the Decree of the President of the Republic of Uzbekistan No. 5863 dated 30.10.2019 "On approval of the Concept of Environmental Protection of the Republic of Uzbekistan until 2030",

If it is necessary to transplant any tree during construction work, the client must apply to the Public Services Center for permission to cut down trees in accordance with the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 255 dated March 31, 2018.

In case of illegal felling of trees, the client must be held liable in accordance with applicable law.

Timely carry out the envisaged measures for the technical reclamation of disturbed lands.

Fully comply with the requirements of Chapter 5 of Article 16 (Conditions for the Use of Natural Resources) and Chapter 10 of Article 45 (Protection of Nature from Waste Pollution) of the Law of the Republic of Uzbekistan "On Nature Protection".

The conclusion of the state environmental expertise on the compliance of the object of the state environmental expertise with environmental requirements **shall be valid for three years from the date of its issuance.**

Control over compliance with the requirements of environmental legislation at the plant is assigned to the Romitan District Inspectorate for Ecology, Environmental Protection and Climate Change of the Bukhara Regional Administration.

The commissioning of this facility should not be allowed without a positive conclusion on the statement of environmental effects.

Director of the branch **M. Makhmudov**

Responsible state environmental appraisal expert: Vosiyev Sukhrob Sanokulovich

Tel: 998-71-203-0022 (1022)

ANNEX 3 – MINUTES OF PUBLIC STAKEHOLDER MEETINGS

16 августа 2024 года

ПРОТОКОЛ
Проведение общественной консультации в районном центре Рамитан по проекту «Развитие и модернизация систем водоснабжения и канализации Бухарской области (Фаза-1, Компонент -2: Канализация)»

Хокимият Рамитанскго района

Председатель собрания: Бахтиёр Назаров - заместитель директора АО "Бухоро Сувтаминот" по вопросам инвестиции
Присутствовали:
Хоким Рамитанского района – Барноев Умид Исаевич
Мустафаев Джоракул Сулаймanович, заместитель хокима по строительству Рамитанского района
Расулов Джамшид Пайзуллоевич, начальник ОВД Рамитанского района, глава 3-сектора
Камолов Ибрат Хикматулаевич, начальник отдела экологии и охраны окружаещей среди Рамитанкого района Бухарской области
Кахоров Бакшилло, начальник Санитарно-эпидемиологические службы Рамитанского района Бухарской области
Тагоев Бахтиер Камолович, сотрудик управления Благоустройства хокимията Рамитанского района
Председатели МСГ районного центра Рамитан
Жалилов Акмаль Некович, АБИИ ГКП, инженер по водоснабжению и канализации,
Остонов Шохимардон Маризоевич, АБИИ ГКП, инженер по водоснабжению и канализации
Акмаль Кодиров, инженер инвестиционного отдела АО «Бухаро Сувтаминот»
Отабоев Максуд Мухаммадович, начальник Ромитанского филиала АО «Бухаро Сувтаминот»
МаксименкоПётр Ильич, менежер проекта компании «Nicholas O'Dwyer»
Санатжон Муродов, местный инженер-проектировщик ООО «Asia Engineering Group»
Зуура Мендикулова – международный специалист по социальному развитию от компании «Nicholas O'Dwyer»
Фуркат Олимов – местный специалист по социальным вопросам ООО «Asia Engineering Group»
Жахангир Гадаев – местный специалист по экологическим вопросам ООО «Asia Engineering Group» (*онлайн выступление*)
Аваз Нуров – сотрудник/переводчик офиса в компании «Nicholas O'Dwyer Бухаре»
Актив районного центра Рамитан Бухарской области
Всего присутствовало 30 человек

Предметом обсуждения на общественной консультации были следующие законодательные акты: Постановление Кабинета Министров РУ «О дальнейшем совершенствовании механизма оценки на окружающую среду» за №541 от 07.09.2020 года; Закон РУ «О санитарно-эпидемиологическом благополучии населения» за №393 от 26.08.2015 ГОДА; Постановление Президента РУ «О мерах по совершенствованию порядка выделения земельных участков для инженерно-коммуникационных сетей» ПП-204 от 12.04.2022;Постановление Кабинета Министров РУ «Об утверждении Положения об индивидуальном жилищном строительстве» №272 от 30.12.2006; Постановление Кабинета Министров РУ «Развитие и модернизация систем водоснабжения и канализации Бухарской области» с участием Азиатского Банка Инфраструктурных Инвестиций» ПКМ-482 от 12.08.2023 года.

Хоким Рамитанского района – Умид Барноев открыл общественную консультацию и сообщил собравшимся о цели данного мероприятия, которая состоит в том, чтобы улучшить и облегчить процесс принятия решений, связанных с Проектом, и создать возможности для своевременного активного участия всех заинтересованных сторон, а также предоставить всем бенефициарам возможность высказать свое мнение и опасения, которые могут повлиять на решения по Проекту по строительству канализационных сетей на территории города Рамитан Бухарской области.

Бахтиёр Назаров, заместитель директора АО "Бухоро Сувтаминот" по вопросам инвестиции, проинформировал присутствующих о том, что в районном центре Рамитан Бухарской области предусмотрено строительство центральной канализационной системы. Проект включает строительство канализационных сетей, 11 канализационных насосных станций и одного КОС в черте города Рамитан. Протяжённость канализационных сетей составляет 102 км. Работы по строительству канализации будут проводится в районном центре Рамитан в пределах МСГ «Зарафшан», «Гулистан», «Афросиёб», «А.Навоий», «Бобур», «Тарнаут», «Ибн Сино», «Рамитан». Общая сумма данного проекта составляет около 15,3 млн. долларов США.

Зуура Мендикулова представила участникам общественной консультации информацию о деятельности Консультанта «Nicholas O'Dwyer» по взаимодействию заинтересованных сторон по реализации проекта. Вся информация была представлена фотографиями, на которых были запечатлены основные моменты деятельности Консльтатнта «Nicholas O'Dwyer» по разработке проектно-сметной документации канализационных сетей, концепта КОС и отчетов по экологическим и социальным мерам безопасности.

Далее участникам встречи была представлена презентация с голосовым сопровождением местного консультанта по экологии Жахонгира Гадаева. Презентация была посвящена вопросам воздействия проекта на окружающую среду и мерах по смягчению этого воздействия и что целью проекта является охрана окружающей среды. Ж. Гадаев разъяснил, что реализация проекта приведет к улучшению санитарно-эпидемиологической обстановки и снижения заболеваемости населения инфекционными заболеваниями. За счет этих проектов будет достигнуто полное прекращение сброса неочищенных стоков в водные объекты, а также значительное снижение подземных вод и поверхностных водотоков.

Ж. Гадаев проинформировал, что подготовлен новый документ по ЗВОС. Основная работа заключалась в изучение влияния строительства на окружающую среду. Негативные воздействия при реализации Проекта, в основном, имеют краткосрочную природу и относятся к стадии строительства, которые предполагают проведение работ за пределами существующих производственных площадок. Эти эффекты включают шум, производимый строительной техникой, местные кратковременные увеличения интенсивности дорожного движения с соответствующими выбросами в атмосферу, нарушение ландшафта и почвенного покрова во время земляных работ и т.д.

В целях безопасного ведения процесса строительных работ необходимо соблюдать следующие правила:

-технологический процесс вести в соответствии с регламентом, строго соблюдать инструкцию по безопасному ведению технологического процесса;

-содержать в исправном состоянии оборудование, насосы для перекачки сточных вод, средств пожаротушения и индивидуальной защиты.

Фуркат Олимов, местный специалист по социальному развитию компании «Nicholas O'Dwyer», вначале предоставил информацию о целях проекта по социальным вопросам. Фуркат пояснил присутствующим, что вопросы гендерного равенства также являются приоритетом для данного проекта. После запуска проекта в реализацию проекта должны быть вовлечены минимум 30% специалистов женского пола из местных сообществ. В ходе строительных работ будет вестись постоянный контроль качества условий труда. В период строительных работ необходимо проведение просветительской пропаганды в школах, махаллаях и поликлиниках по правильному использованию водопровода и канализации.

Далее Ф.Олимов проинформировал участников собрания о том, что в целях упорядочения индивидуального жилищного строительства Кабинет Министров РУ (ПКМ № 272 от 30 декабря 2006 г.) утвердил «Положение об индивидуальном жилищном строительстве», согласно которому «Самовольной постройкой считаются жилые дома, другие строения и сооружения или иное недвижимое имущество, построенные застройщиками на земельных участках, не отведенных для этих целей в порядке, установленном законодательством, а также возведенные без получения на это необходимого разрешения либо с существенным нарушением градостроительных норм и правил (статья 33 Положения).

Ф.Олимов рассказал присутствующим, что в соответствии со статьями 34 и 35 «Положения об индивидуальном жилищном строительстве», утверждённого Постановлением Кабинет Министров № 272 от 30 декабря 2006 г. «В случае обнаружения самовольной постройки должностными лицами органов архитектуры и строительства районов (городов) составляется акт о факте самовольной постройки. Одновременно с составлением акта должностными лицами органов архитектуры и строительства районов (городов) выдается предписание о приостановлении самовольной постройки. Копия предписания представляется в хокимият района (города) для дальнейшего решения вопроса по самовольно возведенному строению в установленном порядке». Фуркат обратил внимание присутствующих на тот факт, что в районном центре Каракуль некоторые домохозяйства вынесли свои септики за территорию своего придомового участка. Так как некоторые улицы очень узкие, то септики были устроены вдоль дорог. А эти участки находятся в ведении Управления благоустройства.

Ф.Олимов пояснил, что в ходе строительных работ, некоторые септики могут попасть в зону строительной площадки. Так как эти септики находятся за пределами границ домовладения незаконно, то домохозяйства должны перенести свои септики с общественной территории на участок собственного домовладения временно. Как только канализационная сеть будет построена, они должны будут подключиться к построенным домовым колодцам централизованной канализации. Поэтому процесс переноса

септиков на территорию домохозяйства можно осуществить накануне строительных работ, когда уже точно будет известно, чьи септики попадают в зону прокладки траншеи.

Фуркат, объяснил присутствующим, что жители, чьи септики находятся впритык к дороге, должны будут демонтировать свой септик за свой собственный счет. Потому что они устроили свой септик в нарушение законодательства Республики Узбекистан.

Фуркат обратился к присутствующим на встрече Председателям МСГ с предложением, что консультанты по социальному развитию компании «Nicolas O'Dwyer» и ООО «Asia Engineering Group» готовы оказать содействие им по информированию жителей махаллей. Для этого Председатели МСГ должны задержаться после собрания, чтобы вместе с Фуркатом составить график встреч с населением.

После выступлений Консультантов началась сессия «Вопросы и ответы».

Вопрос: Какие новые технологии будут использоваться в рамках данного проекта и как будет решаться вопрос с иловыми осадками.

Ответ – Петра Максименко менежер проекта компании «Nicolas O'Dwyer» разъяснил что будет использоваться замкнутый цикл, при котором иловые осадки будут перерабатываться компост. Иловые осадки будут складывается в бурты куда будут добавлять ветки, стебля, пищевые отходы и т.п. Специальное техника будет ворошить эти бурты, где температура будет подниматься до 70°С и таким образом все болезнетворные микроорганизмы погибнуть. Это будет правильным решением, потому что конечный продукт уже можно будет использовать как удобрения для земель фермерских хозяйств. После своего выступления Петр показал присутствующим видеоролик, визуально демонстрирующий концепт КОС замкнутого цикла. Видеоролик вызвал большой интерес со стороны присутствующих и был для них хорошим наглядным примером, что собой представляют очистные сооружения.

Вопрос от участника встречи – предусмотрена ли техника и новое оборудование для данных проектов?

Ответ Б.Назаров: в рамках проекта для всей проектной зоны пяти районных центров выделено более одного миллиона долларов США на закупку техники и оборудования.

Вопрос У.Барноева: сможете показать, как будет происходить домовое подключение, за чей счет будет оно производится?

Ответ Б.Назарова: подключение к домовому колодцу будет за счет самого домохозяйства.

Ответ П.Максименко, Ф.Олимов, А.Кодиров: ими была продемонстрирована на мониторе и разъяснена схема подключения домохозяйств на примере конкретной улицы. Перед каждым домом будет установлен колодец домового подключения, через который сточные воды будут транспортирует в уличные сети или магистральный (главный) коллектор.

Вопрос (Хоким района, Начальник Управления внутренних дел района): при повреждении дорожный покрытий (из бетона, асфальта и т.д.), кто будет восстанавливать их, каков порядок их восстановления, кто будет возмещать расходы на восстановление? В Каракуле были случаи просадки грунта и дороги после завершения строительно-монтажных работ. Нужно, чтобы подрядчик нес ответственность за восстановление в течения 2 лет по завершение строительства.

Ответ Ф.Олимов: После определенного, так называемого «времени отсечения» никакие претензии на компенсацию не принимаются; Б. Назаров: Восстанавливаемый слой дороги состоит из двух частей: первый нижний слой толщиной в 5 см, который будет восстанавливать подрядчик, а второй верхний слой толщиной в 7 см, будет восстановлен дорожными службами или благоустройства. Он также предложил ограничить ответственность подрядчика за восстановление поврежденного дорожного покрытия 1-1,5 годами после проведения строительных работ.

Вопрос У.Барноев: как быть с септиками домохозяйств, которые могут помещать строительству?

Ответ А. Кодиров: после переноса таких септиков, они будут подключены к домовым колодцам через соединительные трубы. (Б. Назаров): при водоканале каждого района будут созданы отделы по канализации, будут приобретены техника и оборудование на областном уровне и распределены по районам.

Хоким района: уже сейчас нужно проводить разъяснительную работу среды населения по вопросам септиков домохозяйств и должного пользования канализационной системой.

Вопрос Председателя МСГ: Будут ли подключены организации и предприятия к централизованной сети канализации?

Ответ Б.Назаров: Организации социального значения будут подключены. Например, школы.

П.Максименко: Будут установлены сливные станции ЖБО, куда спецмашины будут сливать сточные воды с объектов, не подключенных непосредственно к централизованной канализационной сети. И

Петр продемонстрировал на мониторе пример такой станции. Так как такая сливная станция герметичная, она не будет генерировать запах в окружающую среду. На примере Рамитана, такая сливная станция будет построена на ГКНС. Также продемонстрировал технологию переработки осадка сточных вод в биогумус для дальнейшей его реализации в народном хозяйстве.

Вопрос от Дж. Мустафаева: надо уточнить, решить и окончательно согласовать местоположение ГКНС. Нужно будет его немного сместить.

Ответ С. Муродова: это вопрос уже был решен и местоположение согласован. Об этом есть решение областного хокима.

Вопрос от начальника СЭС: как работают КНСки, как они перекачивают потоки?

Ответ П.Максименко, Акмаль: на мониторе были продемонстрированы разрезы ГКНС и КНС, и объяснена как они работают и перекачивают сточные воды. Также была и разъяснена система канализации внутри дома и как будет обеспечена удаление запаха.

Вопрос от представителя ГКП: сколько выйдет лишнего грунта с территории проектирования? Как будут с ним поступать?

Ответ Б. Назаров: после начала строительства лишний грунт будет вывозится в специальный ближайший полигон для этих целей.

Вопрос: Начальник Управления внутренних дел: как будет обеспечен отвод сточных вод в далеких населенных пунктах?

Ответ Б.Назаров: Канализационная сеть рассчитана только на районный центр.

Вопрос от начальника СЭС: Будут ли переходы через препятствия и водные артерии (каналы, арыки), и если да, то под или над каналом?

Ответ Б.Назаров: да, такие места есть. Будет ли переход трубопровода над или под каналом, зависит от уровня залегания трубопровода и глубины дна канала. Если первое выше второго, то над водным препятствием, если ниже, то под каналом.

Б.Назаров завершил общественную консультацию, акцентируя внимание участников встрчи, что данный проект направлен на улучшение здоровья и благосостояние населения города Рамитана.

Участниками общественной консультации было составлено Постановление на основании вышеизложенного.

ПОСТАНОВЛЕНИЕ:

1. Участники осведомлены, что будут построены канализационные сети, КНС и КОС. Участники общественной консультации поддерживают проект по строительству централизованной канализации в районном центре Рамитан Бухарской области.
2. Домохозяйства, чьи септики находятся за пределами частного домовладения в непосредственной близости проезжей дороги, должны написать заявление о том, что они перенесут свои септики на территорию своего домовладения перед началом строительных работ за счет собственных средств.
3. Соответствующими службами и общественностью будет вестись контроль за технологическим процессом водоотведения, за исправностью канализационных очистных сооружений.
4. На Председателей МСГ проектной зоны возлагаются задачи проинформировать жителям своих махаллей о ходе проекта, а также уведомить их, что расходы по временному переносу септиков осуществляется насчет владельцев этих септиков.

Председатель общественной консультации: Б.Назаров

Секретарь общественной консультации: А. Нуров

16 August 2024

Minutes of Meeting
Conducting a public consultation in Ramitan district centre under the Project "Development and modernization of water supply and sewerage systems in Bukhara region (Phase-1, Component -2: Sewerage)"

Khokimiyat of Ramitan district

Chairman of the meeting: Bakhtiyor Nazarov - Deputy Director of Bukhoro Suv Taminot JSC for investment issues
Attended by:
Barnoev Umid, Khokim of Ramitan district
Mustafayev Djorakul, Deputy khokim for construction of Ramitan district
Rasulov Jamshid, Head of Ramitan Internal Affairs Department, Sector 3
Kamolov Ibrat, Head of the Ecology and Environmental Protection Department among the Ramitan district of Bukhara region
Kakhorov Bakshillo, Head of Sanitary and Epidemiological Services of Ramitan district of Bukhara region
Tagoev Bakhtiyor, an employee of the Department of Land Improvement of Ramitan khokimiyat
Chairmen of the Ramitan Mahalla Citizens Gathering (mahallas)
Jalilov Akmal, AIIB PCU, Water Supply and Sewerage Engineer
Ostonov Shohimardon, AIIB PCU, Water Supply and Sewerage Engineer
Kodirov Akmal, Engineer of the Investment Department of Bukharo Suv Taminot JSC
Otaboev Maksud, Head of the Romitan branch of Bukharo Suv Taminot JSC
Maksimenko Peter, Team Leader of the company "Nicholas O'Dwyer"
Murodov Sanatjon, Local Design Engineer of Asia Engineering Group LLC
Mendikulova Zuura, International Social Development Specialist from the company “Nicholas O'Dwyer”
Olimov Furkat – Local Social Specialist of LLC “Asia Engineering Group”
Gadayev Jahangir – Local Environmental Specialist of LLC “Asia Engineering Group” (*online presentation*)
Nurov Avaz - Office employee/translator of the company “Nicholas O'Dwyer” in Bukhara"
Stakeholders of Ramitan district of Bukhara region
Total attendees: 30 people

The following legislative acts were the subject of discussion at the public consultation: Resolution No. 541 of the Cabinet of Ministers of the Republic of Uzbekistan "On further improvement of the Environmental Impact Assessment Mechanism" dated 07.09.2020; Law No. 393 of the Republic of Uzbekistan "On Sanitary and Epidemiological Welfare of the Population" dated 26.08.2015; Decree No.PP-204 of the President of the Republic of Uzbekistan "On Measures to Improve the Procedure for land plots for engineering and communication networks" dated 12.04.2022; Resolution No.272 of the Cabinet of Ministers of the Republic of Uzbekistan "On approval of the Regulation on Individual Housing Construction" dated 30.12.2006; Resolution No.PKM-482 of the Cabinet of Ministers of the Republic of Uzbekistan "Development and modernization of water supply and sewerage systems of the Bukhara region" with the participation of the Asian Infrastructure Investment Bank" dated 12.08.2023.

Khokim of Ramitan district - Umid Barnoyev opened a public consultation and informed the audience about the purpose of the event, which is to improve and facilitate the decision-making process related to the Project, and to create opportunities for timely active participation of all stakeholders as well as provide all beneficiaries with an opportunity to express their opinions and concerns that may affect decisions on the Project for Construction of Sewage Networks in the Ramitan city, Bukhara region.

Nazarov Bakhtiyor, Deputy Director of Bukhoro Suv Taminot JSC regarding the investment, informed the participants that the construction of a central sewage system is planned in the Ramitan district centre of Bukhara region. The Project includes the construction of sewer networks, 11 sewage pumping stations and one WwTP within the boundaries of Ramitan city. The length of sewer networks is 102 km. Sewer construction works will be carried out in Ramitan district centre within the MSG "Zarafshan", "Gulistan", "Afrosiyob", "A.Navoi", "Bobur", "Tarnaut", "Ibn Sino", "Ramitan". The total amount of this Project is about USD 15.3.

Zuura Mendikulova provided the participants of the public consultation with information about the activities of the Nicholas O'Dwyer Consultant on the interaction of stakeholders in the implementation of the Project. All information was provided with photos that captured the main moments of the Nicholas O'Dwyer Consultant's activities on the development of design and estimate documentation for sewer networks, the WwTP concept

and reports on environmental and social safety measures.

Then the participants of the meeting were presented with a presentation with voice accompaniment of Jahongir Gadayev, the local Environmental Consultant. The presentation was devoted to the project's impact on the environment and mitigation measures for this impact, and the project goal is to protect the environment. J. Gadayev explained that the implementation of the Project will lead to an improvement in the sanitary and epidemiological situation and reduce the incidence of infectious diseases in the population. These projects will achieve a complete cessation of the discharge of untreated wastewater into water bodies, as well as a significant reduction in groundwater and surface watercourses.

J. Gadayev informed that a new document on the EISA has been prepared. The main work was to study the impact of construction on the environment. Negative impacts during Project implementation are mainly of a short-term nature and relate to the construction stage, which involve carrying out work outside the existing sites. These effects include noise generated by construction machinery, local short-term increases in traffic intensity with associated atmospheric emissions, disturbance of the landscape and ground cover during excavation, etc.

In order to safely conduct the construction process, the following rules shall be observed:

- conduct the technological process in accordance with the regulations, strictly follow the instructions for the safe conduct of the technological process;

- maintain equipment, pumps for pumping waste water, fire extinguishing equipment and personal protective equipment in a good condition.

Furkat Olimov, local Social Development Specialist of Nicholas O'Dwyer, initially provided information on the project social objectives. Furkat explained to the audience that gender equality surveys are a priority for this Project. Once the project is launched, a minimum of 30% of female professionals from local communities shall be involved in the project implementation. During construction work, the quality of working conditions will be constantly monitored. During the construction period, it is necessary to conduct educational propaganda in schools, mahallas and polyclinics on the correct use of water supply and sewerage.

Further F.Olimov informed the participants of the meeting that in order to streamline individual housing construction, the Cabinet of Ministers of the Republic of Uzbekistan (PKM No. 272 dated December 30, 2006) approved the "Regulation on Individual Housing Construction", according to which "Unauthorized construction is considered to be residential buildings, other buildings and structures or other real estate built by developers on land plots, not designated for these purposes in accordance with the procedure established by law, as well as erected without obtaining the necessary permission or with a significant violation of urban planning norms and rules (Article 33 of the Regulations).

F.Olimov told the audience that in accordance with Articles 34 and 35 of the "Regulations on Individual Housing Construction", approved by the Cabinet of Ministers Resolution No. 272 dated December 30, 2006. "In case of detection of unauthorized construction, officials of the architecture and construction bodies of districts (cities) draw up an act on the fact of unauthorized construction. Simultaneously with drawing up the act, officials of the architectural and construction bodies of districts (cities) issue an order to suspend the unauthorized construction. A copy of the order is submitted to the khokimiyat of the district (city) for further resolution of the issue of unauthorized construction in accordance with the established procedure." Furkat drew the attention of those present to the fact that in the Karakul district centre, some households took out their septic tanks outside the territory of their house plot. Since some streets are very narrow, septic tanks were built along the roads. And these sites are under the jurisdiction of the Landscaping Department.

F.Olimov explained that during construction work, some septic tanks can get into the area of the construction site. Since these septic tanks are located outside the boundaries of the household illegally, households shall temporarily move their septic tanks from the public territory to their household site. As soon as the sewer network is built, they shall connect to the built house manholes of centralized sewerage. Therefore, the process of transferring septic tanks to the household territory can be carried out before construction work, when it is already known exactly whose septic tanks fall into the trench area.

Furkat explained to the audience that residents whose septic tanks are located close to roadsewill have to dismantle their septic tank at their own expense. Because they set up their own septic tank in violation of the legislation of the Republic of Uzbekistan.

Furkat addressed the MSG Chairmen present at the meeting with a proposal that the Social Development Consultants of the company "Nicolas O'Dwyer" and LLC "Asia Engineering Group" are ready to assist them in informing the residents of mahallas. To do this, the MSG Chairmen should stay after the meeting to work out a schedule of meetings with the public jointly with Furkat.

After the presentations of the Consultants, the session "Questions and Answers" began.

Question: What new technologies will be used in this project and how will the sludge issue be resolved?

Answer: P. Maksimenko, team leader of the Project of the company "Nicolas O'Dwyer" explained that a closed cycle will be used, in which sludge will be processed as compost. Sludge will be formed into piles where branches, stems, food waste, etc. will be added. Special equipment will stir up these piles, where the temperature will rise to 70°C and thus all pathogens will die. This will be the right decision because the final product can already be used as fertilizer for farmland. After his speech, Peter showed the audience a video, that visually demonstrates the WwTP concept design of an endless circle. The video aroused great interest on the part of those present and was a good visual example of what treatment facilities are.

Question from the meeting participant – are the equipment and new equipment for these projects provided?

Answer: B. Nazarov: more than one million USD were allocated for the procurement of machinery and equipment for the entire project area of five district centres for this purpose.

Question from U. Barnoyev: can you show how the house connection will take place and at whose expense it will be made?

Answer from B. Nazarov: connection to the house manhole will be at the expense of the household owner.

Answer from P. Maksimenko, F. Olimov, A. Kodirov: they demonstrated on the monitor and explained the scheme of connecting households on the example of a specific street. In front of each house there will be a manhole connected to the house, through which the waste water will be transported to the street networks or the main collector.

Question (Khokim of the district, Head of the Internal Affairs Department of the district): In case of damage to road surfaces (made of concrete, asphalt, etc.), who will restore them, what is the procedure for their restoration, who will reimburse the costs of restoration? In Karakul, there were cases of subsidence of soil and roads after the completion of construction and installation works. The contractor shall be responsible for the restoration within 2 years of completion.

Answer from F. Olimov: After a certain, so-called "cut-off time", no claims for compensation are accepted; B. Nazarov: The restored road layer consists of two parts: the first lower layer with a thickness of 5 cm, which will be restored by the contractor, and the second upper layer with a thickness of 7 cm, will be restored by road services or landscaping. He also suggested limiting the contractor’s responsibility for restoring damaged road surfaces to 1-1. 5 years after the construction work.

Question U. Barnoev: what should be done with septic tanks of households that can prevent construction?

Answer from A.Kodirov: after transferring such septic tanks, they will be connected to the house manholes through connecting pipes. (B. Nazarov) : at the water utility of each district, sewage departments will be created, and machinery and equipment will be purchased at the regional level and distributed to districts.

Khokim of the district: it is already necessary to conduct explanatory work among the environment of the population on the issues of household septic tanks and proper use of the sewer system.

Question from MSG Chairman: Will organizations and enterprises be connected to the centralized sewerage network?

Answer from B. Nazarov: Organizations of social significance will be connected. For example, schools.

P. Maksimenko: There will be installed wastewater discharge stations, where special vehicles will discharge wastewater from the Works that is not directly connected to the centralized sewer network. And Peter showed an example of such a station on the monitor. Since such a septage receiving unit is sealed, it will not generate an odor to the environment. On the example of Ramitan, such a septage receiving unit will be built at the Main SPS. He also demonstrated the technology of processing sewage sludge into biohumus for its further implementation in the national economy.

Question from J. Mustafayev: The location of the Main SPS shall be clarified, decided and finally agreed. You will need to move it a little.

Answer from S. Murodov: This issue has already been resolved and the location has been agreed. This is the decision of the regional khokim.

Question from Head of SES: How do SPS work, how do they pump flows?

Answer from P.Maksimenko, Akmal: the monitor showed the sections of the MSPS and SPS, and explained how they work and pump wastewater. The sewage system inside the house was also explained and how the smell will be removed.

Question from a representative of PCU: how much excess soil will be released from the design area?

What will they do with it?

Answer from B. Nazarov: after the construction commencement, the excess soil will be removed to a special nearest landfill for these purposes.

Question from the Head of the Internal Affairs Department: how will wastewater discharge be provided in remote localities?

Answer from B. Nazarov: The sewer network is designed only for the district centre

Question from the head of the SES: Will there be crossings over obstacles and waterways (canals, ditches), and if so, under or above the canal?

Answer from B.Nazarov: yes, there are such places. Whether the pipeline will pass over or under the canal depends on the level of the pipeline and the depth of the channel bottom. If the first is higher than the second, then above the water obstacle, if below, then under the canal.

B. Nazarov concluded the public consultation by emphasizing to the participants of the meeting that this project is to improve the health and well-being of the population of Ramitan city.

Participants in the public consultation drew up a resolution based on the above.

RESOLUTION:

1. Participants are aware that sewer networks, SPS and WwTP will be constructed. Participants of the public consultation meeting support the project for the construction of a centralized sewer system in district centre of Bukhara region.
2. Households whose septic tanks are located outside of a private household in the immediate vicinity of roadways should write a statement stating that they will move their septic tanks to the territory of their household before starting construction work at their own expense.
3. The relevant services and the public will monitor the technological sewerage process and the serviceability of wastewater treatment facilities.
4. The MSG Chairman of the project area is imposed a task to inform residents of their mahallas about the project progress, as well as to inform them that the temporary relocation of septic tanks is being carried out by the owners of these septic tanks.

Secretary of the Public Consultation Meeting: A. Nurov _____

Chairman of the public consultation: B. Nazarov _____

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Ref/Исх: 20914.20231128.NOD-BHK WU.COR.129
Date/Дата: 28/11/2023

Attention: *Mr. Nazarov B.,*
Deputy Director of LLC "Bukhara Suv Taminoti" for international investment projects;

buxsuvtaminot.abii@gmail.com

Assignment name: "Development and modernisation of the sewerage system in Gizhduvan, Romitan, Karakul, Alat and Karaulbazar district centres of Bukhara region (1st priority)". Component 2: Sewerage.

Contract No.: BWSP/QCBS-S/02

Subject: Technical note.

Кому: Заместителю директора ООО «Бухара Сувтаминот» по международным инвестиционным проектам,
г-ну Бахтиеру Назарову;
buxsuvtaminot.abii@gmail.com

Проект: «Развитие и модернизация систем канализации райцентров Гиждуван, Ромитан, Каракуль, Алат и Караулбазар Бухарской области (I приоритет)». Компонент 2: Канализация.

Договор №: BWSP/QCBS-S/02

Тема: Техническая записка.

Dear Sirs,

1. Wastewater disposal in the five Project district centers is mainly arranged through individual solutions at the level of private households. Since there is no centralized sewerage system, the majority of households living in individual houses have basic sanitation systems in the form of latrines with cesspools and storage septic tanks.

In recent decades, water supply inside the house has become a widespread practice in urban and rural settlements. People have been installing water heaters, sinks, washing machines, showers/bathrooms, flush toilets. As a rule, wastewater disposal is made into septic tanks, which vary in design, material, depth, etc. And in most cases, households have been installing these septic tanks outside of their household territory. And there is a reason for this: septic tanks require regular emptying. And since this is done with the help of sewage trucks, it is more convenient to clean the septic tank if it is arranged along the road.

The arrangement of a septic tank on the household plot creates inconvenience on the one hand, because in addition to the fact that an unpleasant odor may emanate from the septic tank, the septic tank is a source of danger for children, where they

Уважаемые господа!

1. Состояние водоотведения в пяти районных центрах Проекта в основном реализуется за счет индивидуальных решений на уровне частных домовладений. Поскольку централизованная канализационная система отсутствует, у большинства домохозяйств, проживающих в индивидуальных жилых домах, базовые санитарно-технические системы устроены в виде уборных с выгребными ямами и накопительные септики.

В последние десятилетия широкую практику в населенных пунктах городского и сельского типа, получило ввод водоснабжения непосредственно в дом. Люди устанавливают водонагревательные приборы, раковины, стиральные машинки-автоматы, душевые/ванные, смывные туалеты. Как правило, водоотведение производится в септики, которые различны по устройству, материалам, глубине залегания и т.д. И в большинстве случаев эти септики домохозяйства устанавливают за пределами территории своего домохозяйства. И этому есть причина: септики требуют регулярного опорожнения. И так как это делается с помощью ассенизаторских машин, удобнее очистить септик, если он устроен вдоль дороги.

Устройство септика на придомовом участке, с одной стороны, создает неудобства, потому что, кроме того, от септика может исходить неприятный запах, септик является источником опасности для детей, куда они могут упасть. В целом, участки

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can fall in. In general, household plots are small - 4-6 acres. On the one hand, it is difficult for a sewage truck to enter the yard, on the other hand, when cleaning the septic tank, there is a high probability of contamination of the area around the septic tank. Therefore, it is common practice to place septic tanks beyond the household property area in most cases.

Photos of septic tanks in Karaulbazar



2. The construction of sewerage networks in the Karaulbazar, Alat, Karakul, Ramitan and Gijduvan district centers, on their large territories, is a new construction because from the very beginning of the development of these cities with construction of their residential buildings and social and cultural facilities, the construction of a centralized sewerage system was not planned. However, the existing septic tanks and sewerage networks are underground and undocumented.

3. A detailed sewerage design is done by topographic survey which shows the location of septic tanks. But the topographic survey does not show the size, depth and material of septic tanks. The issued APAs do not have red lines, so there is no way to determine whether private property is affected.

Despite the fact that the sewerage networks are designed on a public territory - along roads and streets, during construction work there is a high

домохозяйств небольшие - 4-6 соток. С одной стороны, ассенизаторской машине сложно въехать во двор, с другой стороны, при очистке септика велика вероятность загрязнения территории вокруг септика. Поэтому по сложившейся практике, в большинстве случает, септики размещаются за территорией домовладения.

Фотографии септиков в Караулбазаре



2. Строительство канализации в районных центрах Караулбазар, Алат, Каракуль, Рамитан и Гиждуван, на больших их территориях, – это новое строительство. По причине того, что с начала застройки этих районных центров жилыми домами и объектами соцкультбыта не планировалось строительство централизованной канализации. Однако, существующие септики и канализационная сеть находятся под землей и документации на нее зачастую отсутствует.

3. Разработка Рабочих (детальных) проектов канализации делается по топосъемке, которая показывает месторасположение септиков. Но каков его размер, на какой глубине находится, из какого материала выполнен, топосъемка не показывает. Выданные АПЗ не имеют красных линий, поэтому при проектировании нет возможности определить, задета или нет частная собственность.

Несмотря на то, что канализационная сеть проектируется на общественной территории (вдоль дорог, по улицам), в ходе строительных работ

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probability that the project may affect even more households.
• If complaints start during construction work, construction work will be suspended until the conflict is resolved. And if there are too many complaints, then the whole construction may be stopped.
The AIIB's policy takes precedence over the legislation of the Republic of Uzbekistan in these matters.

7. Since the subject under discussion is not an isolated case, but a widespread practice, it is necessary to make a political decision on the issue of individual septic tanks that may be affected during construction work. Without this decision, the approval of the SDDR by AIIB's and/or construction may be delayed indefinitely.

Sincerely yours,

On behalf of Nicholas O'Dwyer
Peter Maksimenko
Team leader. International wastewater expert.

высока вероятность, что под воздействие проекта могут быть попасть даже большее количество домохозяйств.

- Если в ходе строительных работ начнутся жалобы, строительные работы будут приостановлены до разрешения конфликта. А если жалоб очень много, то и всё строительство может свернуться.

Политика АБИИ имеет приоритет над законодательством РУз в этих вопросах.

7. Так как обсуждаемый предмет является не единичным случаем, а повсеместной практикой, необходимо принять политическое решение по вопросу индивидуальных септиков, которые могут быть задеты в ходе строительных работ. Без этого решения, утверждение SDDR АБИИ и/или строительство могут затянуться на неопределенно долгий период.

С уважением,

От имени и по поручению Nicholas O'Dwyer
Максименко Петр Юрьевич
Руководитель группы. Международный эксперт по водоотведению и очистке сточных вод.

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ПРОЕКТ: «РАЗВИТИЕ И МОДЕРНИЗАЦИЯ СИСТЕМ КАНАЛИЗАЦИИ РАЙЦЕНТРОВ ГИЖДУВАН, РАМИТАН, КАРАКУЛЬ, АЛАТ И КАРАУЛБАЗАР БУХАРСКОЙ ОБЛАСТИ (I ПРИОРИТЕТ)». КОМПОНЕНТ 2: КАНАЛИЗАЦИЯ.

ПРОТОКОЛ
КОНСУЛЬТАЦИИ ПО ВОПРОСУ СЕПТИКОВ

Дата и время проведения: 1 декабря 2023, 16:00

Место проведения: Бизнес-центр Хамкор Банк, Офис Консультанта Nicholas O'Dwyer

Участники:

№ п/п	ФИО/должность	Организация/Компания	Форма участия
1.	Бахтиёр Назаров - заместитель директора ООО "Бухоро Сувтаминот" по вопросам инвестиций	ООО «Бухоро Сувтаминот»	Очно
2.	Акмаль Кодиров, начальник отдела «Кадастр и ГИС» ООО «Бухоро Сувтаминот».	ООО «Бухоро Сувтаминот»	Очно
3.	Равшан Рахимов, представитель ГКП в Бухаре	Региональный координатор ГКП	Очно
4.	Татьяна Пушкарская, инженер-проектировщик	ООО «Asia Engineering Group»	Онлайн
5.	Татьяна Позорова, инженер-проектировщик	ООО «Asia Engineering Group»	Онлайн
6.	Ирина Юткина, инженер-проектировщик	ООО «Asia Engineering Group»	Онлайн
7.	Фуркат Олимов, местный консультант по социальному развитию	ООО «Asia Engineering Group»	Онлайн
8.	Жахогир Гадаев, местный специалист по экологическим вопросам	ООО «Asia Engineering Group»	Онлайн
9.	Пётр Максименко, менеджер проекта Руководитель группы.	Консультант «Nicholas O'Dwyer»	Очно
10.	Зуура Мендикулова, международный консультант по социальному развитию	Консультант «Nicholas O'Dwyer»	Очно
11.	Аваз Нуров	ООО «Asia Engineering Group»	Очно

Стенограмма выступлений

Зуура Мендикулова поприветствовала всех участников встречи и уведомила, что сегодняшняя консультация инициирована Консультантом «Nicholas O'Dwyer» по рекомендации ГКП. Зуура кратко оповестила всех о том, что в ходе социальной комплексной проверки было обнаружено, что некоторые жители вывели свою систему водоотведения за пределы границ своего домохозяйства и разместили свои септики на общественной территории вдоль края улиц и дорог. Так как Рабочим проектом канализационная сеть запроектирована по краю дорог и улиц, то некоторые септики могут попасть в границы строительной площадки. Ситуация с септиками была обсуждена с Сайёрой Тиляходжаевой. Ею была дана рекомендация обсудить эту тему с ООО «Бухоро Сувтаминот». Поэтому ситуация с септиками была изложена в виде технической записки и направлена Руководителю отдела инвестиций ООО «Бухоро Сувтаминот» г-ну Бахтиеру Назарову, который предложил провести совместное совещание с инженерами-проектировщиками, консультантами и местным представителем ГКП для изучения ситуации с септиками.

Петр Максименко проинформировал участников встречи, что данная консультация посвящена вопросу домовых подключений к системе центральной канализации. Он напомнил присутствующим, что проектом предусмотрено, что Подрядчик будет строить придомовые колодцы, к которым должны подключаться ближайшие домохозяйства.

Татьяна Пушкарская добавила, что Подрядчик устанавливает придомовые (приемные) колодцы за пределами частной территории на расстоянии не более 30 метров друг от друга и ближайшие 2-3 домохозяйства подключаются к такому колодцу. Если сетевой колодец находится в пределах 3-5 метров, то домохозяйства могут сразу подключаться в сеть.

Зуура Мендикулова поинтересовалась, каким образом будет идти строительство придомовых колодцев на узких улицах, на которых встречаются септики индивидуальных домохозяйств, находящихся за пределами границ их территории?

Бахтиёр Назаров также поинтересовался шириной улиц.

Татьяна Пушкарская ответила, что есть такие улицы, ширина которых менее 4 метров. Поэтому если септики будут располагаться на трассе канализационного коллектора, то без сноса этих септиков не обойтись.

Петр Максименко обратился к участникам с вопросом, что прокладка канализационного коллектора может продолжаться до 3х месяцев в зависимости от сложности условий прокладки. Что делать домохозяйству в этом случае?

Бахтиёр Назаров ответил, что домохозяйство должно построить себе временный септик на частной территории.

Петр Максименко уточнил, а за чей счет будут строиться эти временные септики?

Бахтиёр Назаров однозначно ответил, что **НИКТО** не будет платить за сломанные септики, потому что они уже будут не нужны, так как домохозяйства должны подключиться к придомовым колодцам. Далее он предложил включить расходы по строительству временных септиков в ВОР.

Татьяна Пушкарская ответила, что это сделать не представляется возможным, потому что они построены в нарушение закона так как должны находиться на территории домохозяйств. Кроме того, все септики находятся под землей и на данном этапе неизвестно какого размера эти септики, из какого материала сделаны, какой они глубины. Кроме того, неизвестно сколько вообще септиков, построенных на общественной территории, может попасть в зону проведения строительных работ. Все это станет известным только в ходе строительных работ, а точные местоположения придомовых колодцев будут определяться Подрядчиком, районным филиалом ООО «Бухоро Сутваминот» и представителями конкретных домохозяйств совместно.

Ирина Юткина поддержала коллегу, добавив, что септики не только являются незаконным строительством, но и загрязняют грунтовые воды. И что если жители не перекроют водоотведение из своего домохозяйства в ходе строительных работ, то стоки будут сливаться в траншеи и будут препятствовать строительным работам.

Зуура Мендикулова проинформировала участников встречи, что согласно политикам АБИИ необходимо выплачивать компенсаций людям за повреждение/слом их имущества вне зависимости законно или не законно построено их сооружение.

Татьяна Пушкарская возразила, а за что платить? За их сломанные септики? Жители взамен получат придомовые колодцы, содержимое которых не надо будет регулярно вывозить и платить за это деньги. Кроме того, летом септики источают неприятные запахи. Далее Татьяна добавила, что вопрос не в том, что некоторые септики

могут быть сломаны в ходе прокладки траншей, а в том, чтобы домохозяйства отключили свои системы водоотведения от внешних септиков и сделали временные септики на территории своих домохозяйств.

Татьяна Позорова высказала опасение, что инженеры-проектировщики не могут самостоятельно решить вопрос с частными септиками.

Ирина Юткина предложила написать письма в районные хокимияты, чтобы они решили вопросы септиков, незаконно построенных на муниципальной территории, так как эти септики будут мешать ведению строительных работ.

Петр Максименко уточнил: Надо ли написать в районные хокимияты письма с вопросом о компенсациях за сломанные септики?

Акмаль Кодиров предложил узнать, на каком основании домохозяйства построили свои септики на общественной территории? Затем он задал риторический вопрос, зачем поднимать этот вопрос сейчас на стадии проектирования? И поделился опытом работы одного специалиста на предыдущем проекте, который настолько хорошо умел общаться с людьми, что все споры людей с Подрядчиком решал без Банка, Кадастра и прочих заинтересованных сторон. И в этом проекте тоже надо найти такого хорошего специалиста.

Зуура Мендикулова заметила, что полагаться на такого специалиста не стоит. Потому что, из-за того, что на данный момент не представляется возможным определить, сколько и какие именно септики могут помешать ведению строительных работ, имеется большая вероятность, что септиков в зоне строительной площадки может быть существенное количество. А это означает, что может быть много жалоб и разрешить такой конфликт будет сложно. Жители начнут возмущаться, а это приведет к остановке строительных работ. И пока конфликт не будет урегулирован, разрешения на ведение строительных работ Подрядчик не получит. Поэтому вопрос о септиками, которые находятся за пределами границ придомового участка домохозяйства, придется решать рано или поздно. Поэтому лучше этот вопрос решить сейчас - «на берегу».

Фуркат Олимов согласился, что вопрос с септиками надо решать до начала строительных работ. Люди должны заранее знать об этом, чтобы иметь возможность подготовиться.

Бахтиёр Назаров подчеркнул, что раз АБИИ так заинтересован в социальном вопросе, то необходимо написать письмо Хокимам, чтобы они провели встречи с жителями. И пусть домохозяйства подпишут письма, что не будут иметь претензии, если в ходе строительных работ их септики будут сломаны.

Татьяна Позорова задала вопрос: А как быть, если жители не захотят подписать ?

Ирина Юткина предложила в этом случае получить письма об отсутствии претензий от МСГ.

Бахтиёр Назаров возразил, что это зависит от того, как объяснишь.

Петр Максименко поддержал предложение Б.Назарова, сказав, что возьмет его за основу.

Акмаль Кодиров предложил, чтобы местный специалист-социолог Фуркат Олимов провел предварительную работу, потому что нельзя «буром» идти на население.

Фуркат Олимов согласился, что можно провести разъяснительную работу среди населения посредством Общественных консультаций вначале на уровне хокимиятов, а затем на уровне МСГ,

Петр Максименко подчеркнул, что Консультант может подготовить материалы для махаллинских комитетов по работе с населением.

Татьяна Позорова добавила, что туда необходимо добавить пункт, что домохозяйства, чьи септики могут быть разрушены, должны сами за свой счет сделать временную емкость для стоков на территории своего домохозяйства.

Акмаль Кодиров выразил мнение, что с населением должны работать махаллинские комитеты, потому что они являются местной властью. Они допустили строительство септиков на общественной территории, и они должны урегулировать этот вопрос. Но им надо помочь и правильно все разъяснить жителям.

Бахтиёр Назаров – продолжил, что если мы не будем подсказывать народу, то кто им подскажет и поможет. Канализация им нужна. И они должны понимать, что их септики могут помешать строительству канализации. Вам консультантам необходимо провести разъяснительную работу вначале в районном хокимияте, а затем в махаллях.

Акмаль Кодиров продолжил, что необходимо подключить активистов МСГ, квартальных, старших по улицам.

Бахтиёр Назаров в завершении встречи еще раз повторил консультантам, чтобы они провели разъяснительную работу с населением на уровне районных хокимиятов и махаллинских комитетов для того, чтобы они поняли, что вместо септиков, которые загрязняют подземные воды и окружающую среду, являются источником опасности и болезней, они получат возможность подключиться к центральной канализации.

Жахонгир Гадаев добавил, что условия проживания людей станут более комфортными и качество их жизни улучшиться. Люди должны понимать, что из-за некоторых септиков не должны страдать остальные жители и окружающая среда.

Петр Максименко согласился с предложением ООО «Бухоро Сувтаминот» провести общественные консультации в районных хокимиятах и МСГ с составлением Протоколов, фиксированием участников и получением заявлением от домохозяйств, что перед началом строительных работ владельцы домохозяйств за свой счет устроят временные септики на территории своих домохозяйств, чтобы не мешать проведению строительных работ Подрядчиком по строительству централизованной системы водоотведения в соответствии с разработанной проектно-сметной документацией.

Председатель: Бахтиёр Назаров

Секретарь: Аваз Нуров

“DEVELOPMENT AND MODERNIZATION OF THE SEWERAGE SYSTEM IN GIJDUVAN, ROMITAN, KARAKUL, ALAT AND KARAULBAZAR DISTRICT CENTRES OF BUKHARA REGION (1ST PRIORITY)”. COMPONENT 2: SEWERAGE.

MINUTES OF MEETING
CONSULTATIONS ON SEPTIC TANKS

Date and time: December 1, 2023, 16:00

Venue: Khamkor Bank Business Center, NOD Consultant’s Office

Participants:

No.	Full name/position	Organization/Company	Participation form
1.	Bakhtiyor Nazarov, Deputy Director of Bukhoro Suvtaminot LLC on investment issues	LLC “Bukhoro Suvtaminot “	in presence
2.	Akmal Kodirov, Head of Cadastre and GIS department of LLC “Bukhoro Suvtaminot”	LLC “Bukhoro Suvtaminot “	in presence
3.	Ravshan Rakhimov, representative of PCU in Bukhara	Regional PCU Coordinator	in presence
4.	Tatiyana Pushkarskaya, Design Engineer	Asia Engineering Group LLC	Online
5.	Tatiyana Pozorova, Design Engineer	Asia Engineering Group LLC	Online
6.	Irina Yutkina, Design Engineer	Asia Engineering Group LLC	Online
7.	Furkat Olimov, Local Social Development Consultant	Asia Engineering Group LLC	Online
8.	Jakhogir Gadayev, Local Environmental Specialist	Asia Engineering Group LLC	Online
9.	Petr Maksimenko, Team Leader	Consultant of "Nicholas O’Dwyer"	in presence
10.	Zuura Mendikulova, International social development consultant	Consultant of "Nicholas O’Dwyer"	in presence
11.	Avaz Nurov	Asia Engineering Group LLC	in presence

Transcript of the event

Zuura Mendikulova welcomed all participants of the meeting and informed them that today’s consultation was initiated by the Consultant "Nicholas O'Dwyer" based on the recommendation of PCU. Zuura briefly informed everyone that during the social due diligence, it was found that some residents had moved their wastewater disposal system beyond the boundaries of their household and placed their septic tanks on public territory along the edge of streets and roads. Since the sewer network is designed by the Detailed Design along the edge of roads and streets, some septic tanks may fall into the boundaries of the construction site. The current situation with septic tanks was discussed with Sayera Tilyakhojayeva. She recommended discussing this issue with Bukhoro Suvtaminot LLC. Therefore, the situation with septic tanks was outlined in the form of a technical note and sent to Mr. Bakhtiyor Nazarov, Head of the Investment Department of Bukhoro Suvtaminot LLC, who proposed to hold a joint meeting with design engineers, consultants and a local representative of PCU to study the situation with septic tanks.

Petr Maksimenko informed the participants of the meeting that this consultation is devoted to the issue of house connection to the centralised sewerage system. He reminded the audience that the project stipulates that the Contractor will build manholes adjacent to the house, which should be connected to the nearest households.

Tatiyana Pushkarskaya added that the Contractor installs near the house (inlet) manholes outside the private territory at a distance of no more than 30 meters from each other and the nearest 2-3 households are connected to this manhole. If the network manhole is located within 3-5 meters the households can immediately connect to the network.

Zuura Mendikulova asked how the construction of house-side manholes on narrow streets where septic tanks of individual households located outside the borders of their territory will be carried out.

Bakhtiyar Nazarov also asked about the width of the streets.

Tatiyana Pushkarskaya replied that there are streets with a width of less than 4 meters. Therefore, if the septic tanks are located on the sewer route there is no way to demolish these septic tanks.

Petr Maksimenko addressed the participants with the question that laying the sewer pipeline may take 3 months depending on the difficulty of laying conditions. What should the household do?

Bakhtiyar Nazarov replied that the household should build a temporary septic tank on a private territory.

Petr Maksimenko specified, and at whose expense will the temporary septic tank be built?

Bakhtiyar Nazarov unequivocally replied that **NOBODY** will pay for broken septic tanks, because they will no longer be needed, since households shall connect to the manholes adjacent to the house. He further suggested that the cost of building temporary septic tanks should be included in BOQ.

Tatiyana Pushkarskaya replied that this should not be done because they were built in violation of the law, as they should be located on the territory of households. All septic tanks are located underground, and at this stage, it is unknown what size these septic tanks are, what material they are made of, or how deep they are. In addition, it is unknown, how many septic tanks can fall into the construction site area. All this will become known only during the construction work but the exact locations of house-side manholes will be determined by the Contractor, district branch of Bukhoro Suv Taminot LLC and jointly with representatives of specific households.

Irina Yutkina supported her colleague adding that these septic tanks are not only illegal construction but also pollute underground water. And that if residents do not block the wastewater disposal system from their household the wastewater will be discharged into trenches and interfere with construction work.

Zuura Mendikulova informed the meeting participants that according to AIIB policies, it is necessary to pay compensation to people for damage/demolition of their property, regardless of whether their construction is legally or not legally constructed.

Tatyana Pushkarskaya objected but what should pay for? For their broken septic tanks? In return, residents will receive local manholes that do not need to be cleaned regularly and pay money for this. In addition, septic tanks emit unpleasant odours in summer. Tatyana further added that the issue is not that some septic tanks may be broken during trenching, but that households should disconnect their wastewater disposal systems from external septic tanks and make temporary septic tanks on the territory of their households.

Tatyana Pozorova expressed her concern that the design engineers cannot independently solve the problem with such septic tanks.

Irina Yustkina suggested writing letters to the district khokimiyats to resolve these issues of septic tanks illegally built on municipal property, as these septic tanks will interfere with construction works.

Petr Maksimenko clarified the necessity of writing letters to the district khokimiyats about compensation for broken septic tanks.

Akmal Kodirov suggested finding out on what basis households have built their septic tanks on public territory. Then he asked a rhetorical question, why raise this issue now at the design stage? He shared the experience of one of the specialists in the previous project. This specialist was so good at communicating with people that he resolved all disputes between people and the Contractor without a Bank, Cadastre and other stakeholders. We need to find a good specialist for this project as well.

Zuura Mendikulova noticed that you should not rely on such a specialist. Because, due to the fact that at the moment it is not possible to determine how many and which septic tanks can interfere with the construction work, there is a high probability that there may be a large number of septic tanks in the area e of the construction site. This means that there may be a lot of complaints and it will be difficult to resolve such a conflict. Residents will become indignant, and this will lead to the suspension of construction work. And until the conflict is resolved, the Contractor will not receive permission to conduct construction work. Therefore, the issue of septic tanks that are located outside the boundaries of the household's house plot will have to be resolved sooner or later. Therefore, it is better to solve this issue now " from the start".

Furkat Olimov agreed that the issue of septic tanks should be solved before construction works start. People should know about it in advance to be able to prepare.

Bakhtiyar Nazarov stressed that since the AIIB is so interested in the social issue, it is necessary to write a letter for the Khokims to hold meetings with residents. And let households sign letters that they will not have a claim if their septic tanks are broken during construction work.

Tatiyana Pozorova asked a question, what to do if they don't sign?

Irina Yutkina suggested that in this case they should receive letters of absence of claims from MSG.

Bakhtiyar Nazarov objected that it depends on how you explain it.

Petr Maksimenko supported the proposal of B. Nazarov saying that we will take it as a basis.

Akmal Kodirov suggested that a local specialist, Furkat Olimov, should conduct preliminary work because it is impossible to push the population.

Furkat Olimov agreed that it is possible to carry out explanatory work among the population through public consultations, first at the level of khokimiyats, and then at the level of MSG.

Petr Maksimenko stressed, that the Consultant can prepare documents for mahalla committees on work with the population.

Tatiyana Pozorova added that it is necessary to add a clause that households, whose septic tanks may be destroyed, should make a temporary wastewater tank on the territory of their household at their own expense.

Akmal Kodirov expressed his opinion that mahalla committees should work with the population because they are local authorities. They allowed the construction of septic tanks on public land, and they shall resolve this issue. But they need to assist and properly explain everything.

Bakhtiyar Nazarov continued that if we do not tell the people, then who will tell and assist them? They need a sewerage system. And they should understand that their septic tanks can interfere with the construction of sewers. Consultants need to conduct explanatory work first in the district khokimiyat, and then in the mahallas.

Akmal Kodirov continued that it is necessary to involve MSG activists, quartermasters, and elders for the streets.

Бахтияр Назаров at the end of the meeting once again repeated to the consultants that they should conduct explanatory work with the population at the level of district khokimiyats and mahalla committees in order to make them understand that instead of septic tanks that pollute underground water and the environment, which are a source of danger and diseases, they will be able to connect to centralized sewerage system.

Petr Maksimenko agreed with the offer of Bukhoro suv taminot LLC to hold public consultations in district khokimiayts and MSGs with drawing up MoM, recording participants and receiving applications from households that before starting construction work, household owners will arrange a temporary septic tank on the territory of their household at their own expense in order not to hamper construction works by the Contractor for the construction of the centralized sewerage system in accordance with the developed design and estimate documentation.

Chairman: Bakhtiyor Nazarov

Secretary: Avaz Nurov

«Утверждаю»
Заместитель хакима Рамитанского района Бухарской области

_____ У.И.Барноев
«___» _____ 2023 г.

6 апреля 2023 года

ПРОТОКОЛ

Проведение общественного слушания в Рамитанском районе по проекту «Развитие и модернизация систем водоснабжения и канализации Бухарской области (Фаза-1, Компонент -2: Канализация)»

г. Рамитан

Председатель собрания: Назаров Бахтиёр - заместитель директора “Бухоро сув таъминот” по вопросам инвестиции

Присутствовали:
А.Шодиев – заместитель хакима Рамитанского района _____

М.Отабоев – начальник филиала Рамитанского района “Бухоро сув таъминот” _____

Начальник отдела экологии и охраны окружающей среди Рамитанского района Бухарской области А.Хамроев _____

Начальник Санитарно-эпидемиологические службы Рамитанского района Бухарской области Кенжаев Х. _____

Председатель МСГ «А.Навоий» - _____

Председатель МСГ «Гулистан» - _____

Председатель МСГ «Афрасиёб» - _____

Председатель МСГ «Ибн Сино» - _____

Председатель МСГ «Зарафшан» - _____

Председатель МСГ «Бобур» - _____

Председатель МСГ «Ромитан» - _____

Председатель МСГ «Богча» - Д.Облобердиев _____

Председатель МСГ «Тарнаут» - _____

Руководство ООО «Бухоро Сув Таъминоти»

Данный протокол составлен согласно ПОСТАНОВЛЕНИЮ КАБИНЕТА МИНИСТРОВ РЕСПУБЛИКИ УЗБЕКИСТАН «О ДАЛЬНЕЙШЕМ СОВЕРШЕНСТВОВАНИИ МЕХАНИЗМА ОЦЕНКИ ВОЗДЕЙСТВИЯ НА ОКРУЖАЮЩУЮ СРЕДУ» от 07.09.2020 года.

Цель данного общественного слушания состоит в том, чтобы улучшить и облегчить процесс принятия решений, связанных с Проектом, и создать возможности для своевременного активного участия всех заинтересованных сторон, а также предоставить всем бенефициарам возможность высказать свое мнение и опасения, которые могут повлиять на решения по Проекту Строительство канализационных сетей на территории города Рамитан Бухарской области.

В Рамитане будет осуществляется два компонента (водопровод и канализация) проекта.

Проектом предусмотрено строительство канализационных сетей в г.Рамитан Бухарской области. Проект включает строительство канализационных сетей, насосных станций сточных вод в городе Рамитан. Протяжённость канализационных сетей составляет 102 км. 14 КНС (канализационные насосные станции) будут строится по по городу Рамитан. Работы по строительству канализации будут проводится в районном центре Рамитан в пределах МСГ «А.Навоий», «Гулистан», «Афрасиёб», «Ибн Сино», «Зарафшан», «Бобур», «Ромитан», «Богча» и «Тарнаут».

А также в Рамитанском районе параллельно будут осуществляется работы по строительству водопроводных сетей по всей территорий района.

Также на слушании обозначены воздействия на окружающую среду, которые возможны при строительстве канализационных сетей.

После реализации проекта можно ожидать улучшение санитарно-эпидемиологической обстановки и снижения заболеваемости населения инфекционными заболеваниями. За счет этих проектов будет достигнуто полное прекращение сброса неочищенных стоков в водные объекты, а также значительное снижение подземных вод и поверхностных водотоков.

У.Барноев - во всех этапах работ будут подключены местные специалисты (экологи, специалисты местного водоканала)

Вопрос: Какие новые технологии будут использоваться в рамках данного проекта и как будет решаться вопрос с иловыми осадками.

Ответ – Проектировщик группы консультантов компании «NICOLAS O'DWYER» Т.Позорова разъяснила что будет использоваться замкнутый цикл, при котором иловые осадки будут перерабатываться компост. Иловые осадки будут складывается в бурты куда будут добавлять ветки, стебля, пищевые отходы и т.п. Специальное техника будет ворошить эти бурты где температура будет подниматься до 70°С и таким образом все болезнетворные микроорганизмы погибнуть. Это будет правильным решением потому что конечный продукт уже можно будет использовать как удобрения для земель фермерских хозяйств.

Вопрос от населения – предусмотрен ли техника и технологии для данных проектов.

Ответ Назаров Б.: да предусмотрено в этих целях для всей проектной зоне выделено более одного миллиона долларов США

Ф.Олимов – местный специалисть по социальном вопросам группы консультантов компании «NICOLAS O'DWYER» - дал информации о целях проекта. Вопросы гендерного равенства тоже является приорететом для данного проекта. После запуска

проекта должны на работы вовлечены минимум 30% специалистов женского пола из местных сообществ. Контроль качества условий труда вовремя строительных работ будет осуществлятся ГКП.

В период строительных работ необходимо проведение просветительской пропаганды в школах, махаллаях и поликлиниках по правильному использованию водопровода и канализации.

Вопрос землеотведения будут решаться в рамках законодательства РУз и экологической социальной политики банка AIIB. День проведения данного общественного слушания также является установленной конечной датой (cut-off day) для предотвращения целевого захвата земли.

Ж.Гадаев, местный специалист по окружающей среде: наша цель заключается в охране окружающей среды. Готовится новый документ по ЗВОС. Основная наша работа заключается в изучение влияния строительства на окружающую среду. Негативные воздействия при реализации Проекта, в основном, имеют краткосрочную природу и относятся к стадии строительства, которые предполагают проведение работ за пределами существующих производственных площадок. Эти эффекты включают шум, производимый строительной техникой, местные кратковременные увеличения интенсивности дорожного движения с соответствующими выбросами в атмосферу, нарушение ландшафта и почвенного покрова во время земляных работ и т.д.

В целях безопасного ведения процесса строительных работ необходимо соблюдать следующие правила:

-технологический процесс вести в соответствии с регламентом, строго соблюдать инструкцию по безопасному ведению технологического процесса;

-содержать в исправном состоянии оборудование, насосы для перекачки сточных вод, средств пожаротушения и индивидуальной защиты.

У.Барноев – цель этих проектов направлены на улучшение здоровья и благосостояние населения города Рамитана.

Участниками составлено Постановление на основании вышеизложенного.

ПОСТАНОВЛЕНИЕ:

1. Участники собрания согласны на строительство канализационных сетей, КНС и очистного сооружения города Рамитан в Бухарской области;
2. При функционирование КОС деятельность объекта будет минимально воздействовать на окружающую среду;
3. Инспектором экологии будет вестись контроль за технологическим процессом водоотведения, за исправностью канализационных очистных сооружений;
4. Руководство ООО "БУХОРО СУВ ТАЪМИНОТИ" гарантирует выполнения всех требований, предписанных проектом.

Секретарь собрания Ф.Олимов

Председатель собрания Б.Назаров

Список участников

Общественного слушания по проекту Проекта «Развитие и модернизация систем водоснабжения и канализации Бухарской области (Фаза-1, Компонент-2: Канализация)» районного центра Караулбазар

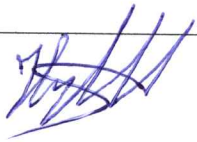
Дата: 06.04.2023

Место проведения: Хокимият Рамитанского р-на

№	Ф.И.О	Организация	Должность	Телефон	Подпись
1	Худоев Самат Ахатович	канцир мфй	раис	937197237	
2	Умаров Худоёр Баландарович	Узбекистон МФЙ	раис	936256074	
3	Сидиков Искандар Алиевич	Тошработ мфй	раис	994218401	
4	Исматов Содриддин Бекмуродович	Азизон МФЙ	раис	93-457-10-44	
5	Азимов Комил Жумаевич	Тарнаут МФЙ	раис	973036393	

№	Ф.И.О	Организация	Должность	Телефон	Подпись
6	Мухаммедов Шохмат Бўриевич	Ургенчский МРЭ Председатель.	Рэис	99 706 26 75	
7	Гайбуллаев Дилшод Умид ўғли	туман мелиоратив Мутахасиси	Мутахасис бош мелиоратор	93 966-05-10	
8	Berdiyeva maxliyo Shodiyevna	Qasaysuvxo'j M.F.J hokim yordamchisi	hokim yordam-chi	94 892. 89.33	
9	Ramirov Nojim Ramazanovich	Ramitan ekologiya va qishloq xo'jaligi xamda bilim bo'limi		94 247 99 8X	
10	Kengaysb Nasiba	tuman SESda XSB	bo'lim mudiri	99.350.65.60	
11	Sharopov Muxriddin	Архитектура бўлими	mutaxassis	93 478 93 99	
12	Qurbonov Maxmud	Ramitan suv tarmoq	xaydovchi	99 208 - 10 11	
13	Azamat Shodiev	хоким ўринбосари	хокимият	98-274-42-48	

№	Ф.И.О	Организация	Должность	Телефон	Подпись
14	Атоева Фахрия Камаловна	Халқ депутатлари Ромитан туманлик Кенгаши	Котибият мудири	91.240.78.56.	
15	Атоев Махфират Нарзуллаевич	Туман Кенгаши Депутати, "Ромитанком" газета редактори.		90-614-19-02.	
16	Худойбердиев Бардомбек Бобир ўғли	Туман кадастр агентлиги етакчи инспектори	етакчи инспектор	91-440-41-15	
17	Облоберганов Давлат Норович.	Боғда мфй раиси.	раис	93-654-89-79	
18	Бозаров Баходир Ерович	"Мезонга" мфй раиси	раис	88 757-45-77	
19	Шўраев Адиз Худойкулович	"Кўргон" мфй раиси	раис	990694034	
20	Ғуломова Saodat Холбуевна	Ўқитувчи МТУ raisi	Rais	91-284-37-51	
21	Ашрапов Хусниддин Бахриддинович	Ромитан туман Савдо инспекция	ходим	99.104.09.79	
22	Хамроев. Аъзам	Ромитан туман Экология бўлими бошлиги		93 625 40 52	

№	Ф.И.О	Организация	Должность	Телефон	Подпись
23	Хусенов Сухроб Фирдавсович.	хокимият	бош мутахассис	(97) 306-71-77	
24	Аташев Ихтиёр Мухаммадович	Ободонамегтирув	Бош мухандис	936238322	
25	Ғаниев Равшан Фаниевич	Координатор ПИУ	координатор	995589667	
26	Холиқов Санжар Саидович.	Ромитан тумани халқ қабулхонаси	мутахассис	91-245-6496	
27					
28					
29					
30					
31					

“Approve”
Deputy Khokim of Ramitan district of
Bukhara region

(sealed and signed) U. I. Barnoyev

_____2023

6 April 2023

Minutes of Meeting
Conducting a public consultation in Ramitan district centre under the Project "Development and modernization of water supply and sewerage systems in Bukhara region (Phase-1, Component -2: Sewerage)"

Ramitan city

Chairman of the meeting: Bakhtiyor Nazarov - Deputy Director of Bukhoro Suv Taminot JSC for investment issues
Attended by:

A.Shodiev – Deputy Khokim of Ramitan district

Otaboev Maksud, Head of the Romitan branch of Bukharo Suv Taminot JSC

Hamroyev A., Head of the Ecology and Environmental Protection Department in the Ramitan district of Bukhara region

Kenjaev H., Head of Sanitary and Epidemiological Services of Ramitan district of Bukhara region

Chairman of A.Navoiy MCG *(sealed and signed)*

Chairman of Gulistan MCG *(sealed and signed)*

Chairman of Afrasiyob MCG *(sealed and signed)*

Chairman of Ibn Sino MCG *(sealed and signed)*

Chairman of Zarafshan MCG *(sealed and signed)*

Chairman of Bobur MCG *(sealed and signed)*

Chairman of Bogcha MCG *(sealed and signed)*

Chairman of Tarnaut MCG *(sealed and signed)*

Head of the Bukharo Suv Taminot JSC

This MoM was drawn up according to Resolution No. 541 of the Cabinet of Ministers of the Republic of Uzbekistan "On further improvement of the Environmental Impact Assessment Mechanism"

dated 07.09.2020.

The purpose of the public hearing is to improve and facilitate the decision-making process related to the Project, and to create opportunities for timely active participation of all stakeholders as well as provide all beneficiaries with an opportunity to express their opinions and concerns that may affect decisions on the Project for Construction of Sewage Networks in the Ramitan city, Bukhara region.

Two project components (water supply and sewerage) will be implemented in Ramitan.

The Project includes the construction of sewer networks, sewage pumping stations and one WwTP within the boundaries of Ramitan city. The length of sewer networks is 102 km. Sewer construction works will be carried out in Ramitan district centre within the MSG "Zarafshan", "Gulistan", "Afrosiyob", "A.Navoi", "Bobur", "Tarnaut", "Bogcha", "Ibn Sino", "Ramitan".

In parallel, the construction of water supply networks will be carried out along the whole district terrain.

In addition, the hearing was devoted to the project's impact on the environment and mitigation measures for this impact, and the project goal is to protect the environment. The implementation of the Project will lead to an improvement in the sanitary and epidemiological situation and reduce the incidence of infectious diseases in the population. These projects will achieve a complete cessation of the discharge of untreated wastewater into water bodies, as well as a significant reduction in groundwater and surface watercourses.

U. Barnoyev – local specialists (environmental specialists, local vodocanal specialists) will be engaged) in all stages of work.

Question: What new technologies will be used in this project and how will the sludge issue be resolved?

Answer: T. Pozorova, the Consultant’s designer of the company "Nicolas O'Dwyer" explained that a closed cycle will be used, in which sludge will be processed as compost. Sludge will be formed into piles where branches, stems, food waste, etc. will be added. Special equipment will stir up these piles, where the temperature will rise to 70°C and thus all pathogens will die. This will be the right decision because the final product can already be used as fertilizer for farmland.

Question from the population – are the equipment and new equipment for these projects provided?

Answer: B. Nazarov: more than one million USD were allocated for the procurement of machinery and equipment for the entire project area of five district centres for this purpose.

F. Olimov – Consultant’s local social specialist the company "Nicolas O'Dwyer" provided information on project objectives. Gender equality issue is also a priority for this project. After the launch of the project, 30% of female specialists from local community should be involved in the works. Quality control of labour conditions during construction works will be made by PCU.

During the construction period, it is necessary to conduct educational propaganda in schools, mahallas and polyclinics on the correct use of water supply and sewerage.

The issue of land allocation will be resolved within the framework of the legislation of the Republic of Uzbekistan and the environmental social policy of AIIB. The date of this public hearing is also a set cut-off day to prevent targeted land seizure.

J. Gadaev — the purpose of this project is to improve the health and well-being of the population. A new document ESIA is being prepared. Our main work is to study the construction impact on the environment. Negative impacts on the Project implementation, mainly, have a short-term nature and relate to the construction stage which suppose the carrying works outside the existing site boundaries. These effects include noise made by construction equipment, local short-term increase in intensity of road movement with corresponding discharges into the air, disfigurement of a landscape and topsoil during earthworks, etc.

In order to safely conduct the construction process, the following rules shall be observed:

- conduct the technological process in accordance with the regulations, and strictly follow the instructions for the safe operation of the technological process;
- maintain equipment, pumps for pumping waste water, fire extinguishing equipment and personal protective equipment in good condition.

U. Barnoyev – the objective of this Project is directed for the improvement of health and public wealth of the Ramitan city.

Participants in the public consultation drew up a resolution based on the above.

RESOLUTION:

1. Participants of the meeting agree to the construction of sewage networks, SPS and wastewater treatment plant in the Alat city in the Bukhara region;
2. If the WwTP operates, the facility's activities will have a minimal impact on the environment;
3. The environmental inspector will monitor the sewerage technological process and the serviceability of wastewater treatment plant.
4. Management of Bukhoro Suv Taminoti JSC guarantees the execution of all requirements stipulated in the Project.

Secretary of the Public Consultation Meeting: F. Olimov *(signed)*

Chairman of the public consultation: B. Nazarov *(signed)*

«Утверждаю»
Председатель МСГ Западный
Рамитанского
района Бухарской области
Гурсунова Мухаё
«13» август 2024 г.

«17» августа 2024 года

ПРОТОКОЛ

Проведение махалинского схода граждан «Западный» районного центра Рамитан по подготовке к реализации проекта «Развитие и модернизация систем водоснабжения и канализации Бухарской области (Фаза-1, Компонент -2: Канализация)»

р/ц Рамитан

Председатель собрания: Гурсунова М – Председатель МСГ «Западный»

Присутствовали члены кенгаша МСГ «Западный», активисты махали, представители местных органов власти, социальных учреждений и филиала ООО «Бухаро Сувтаминот».
Всего присутствовало _____ человек (Список прилагается).

Собрание МСГ проходило в здание МСГ Западный

Сельский сход граждан МСГ «Западный» проходил во исполнение и в соответствии с законодательством Республики Узбекистан: ЗАКОН РЕСПУБЛИКИ УЗБЕКИСТАН за №393 «САНИТАРНО-ЭПИДЕМИОЛОГИЧЕСКОМ БЛАГОПОЛУЧИИ НАСЕЛЕНИЯ» от 26.08.20215 года, ПОСТАНОВЛЕНИЕ ПРЕЗИДЕНТА РЕСПУБЛИКИ УЗБЕКИСТАН «О МЕРАХ ПО СОВЕРШЕНСТВОВАНИЮ ПОРЯДКА ВЫДЕЛЕНИЯ ЗЕМЕЛЬНЫХ УЧАСТКОВ ДЛЯ ИНЖЕНЕРНО-КОММУНИКАЦИОННЫХ СЕТЕЙ» ПП-204 от 12.04.2022 года, ПОСТАНОВЛЕНИК КАБИНЕТА МИНИСТРОВ РЕСПУБЛИКИ УЗБЕКИСТАН «ОБ УТВЕРЖДЕНИИ ПОЛОЖЕНИЯ ОБ ИНДИВИДУАЛЬНОМ ЖИЛИЩНОМ СТРОИТЕЛЬСТВЕ», ПОСТАНОВЛЕНИЕ КАБИНЕТА МИНИСТРОВ РЕСПУБЛИКИ УЗБЕКИСТАН «О ДАЛЬНЕЙШЕМ СОВЕРШЕНСТВОВАНИИ МЕХАНИЗМА ОЦЕНКИ ВОЗДЕЙСТВИЯ НА ОКРУЖАЮЩУЮ СРЕДУ» за №541 от 07.09.2020 года, ПОСТАНОВЛЕНИЕ КАБИНЕТА МИНИСТРОВ «О МЕРАХ ПО РЕАЛИЗАЦИИ ПРОЕКТА «РАЗВИТИЕ И МОДЕРНИЗАЦИЯ СИСТЕМ ВОДОСНАБЖЕНИЯ И КАНАЛИЗАЦИИ БУХАРСКОЙ ОБЛАСТИ» С УЧАСТИЕМ АЗИАТСКОГО БАНКА ИНФРАСТРУКТУРНЫХ ИНВЕСТИЦИЙ» ПКМ-482 от 12.08.2023 года.

Представитель Санитарно-эпидемиологического службы Рамитанского района проинформировал участников, что текущая санитарно-эпидемиологическая обстановка и неадекватная существующая санитарная инфраструктура являются одними из основных причин заболеваний населения инфекционными и паразитарными заболеваниями. Смертность от инфекционных и паразитарных заболеваний занимает второе место после заболеваний сердечно-сосудистой системы. От инфекционных и паразитарных

заболеваний особенно страдают дети и женщины. Представитель Сан-эпид. надзора напомнила присутствующим, что в соответствии с Законом РУ «О санитарно-эпидемиологическом благополучии населения» органы самоуправления граждан должны «Осуществлять общественный контроль на соответствующей территории за реализацией мероприятий в области санитарно-эпидемиологического благополучия населения, соблюдением правил застройки и содержания дворовых и придомовых территорий (статья 14). А граждане обязаны соблюдать требования законодательства о санитарно-эпидемиологическом благополучии населения и не допускать действий, влекущих за собой нарушения прав других граждан на охрану здоровья и благоприятную среду обитания (статья 17). Кроме того, текущая санитарная практика на уровне домохозяйств и водоотведение снижают качество жизни и уровень благоустройства индивидуального жилья.

Начальник районного отдела экологии и охраны окружающей среды, проинформировал присутствующих, что существующая практика санитарии и водоотведения ведет к загрязнению окружающей среды и грунтовых вод. В условиях роста дефицита воды загрязнение грунтовых и поверхностных вод создает опасность для жизнедеятельности населения и будущих поколений.

Представитель управления Благоустройства хокимиата Рамитанского района проинформировал участников схода о том, что в целях упорядочения индивидуального жилищного строительства Кабинет Министров РУ (ПКМ № 272 от 30 декабря 2006 г.) утвердил «Положение об индивидуальном жилищном строительстве», согласно которому «Самовольной постройкой считаются жилые дома, другие строения и сооружения или иное недвижимое имущество, построенные застройщиками на земельных участках, не отведенных для этих целей в порядке, установленном законодательством, а также возведенные без получения на это необходимого разрешения либо с существенным нарушением градостроительных норм и правил (статья 33 Положения).

Представитель районного управления архитектуры сообщил участникам схода, что в соответствии со статьями 34 и 35 «Положения об индивидуальном жилищном строительстве», утверждённого Постановлением Кабинет Министров № 272 от 30 декабря 2006 г. «В случае обнаружения самовольной постройки должностными лицами органов архитектуры и строительства районов (городов) составляется акт о факте самовольной постройки. Одновременно с составлением акта должностными лицами органов архитектуры и строительства районов (городов) выдается предписание о приостановлении самовольной постройки. Копия предписания представляется в хокимият района (города) для дальнейшего решения вопроса по самовольно возведенному строению в установленном порядке.». Архитектор обратил внимание присутствующих на тот факт, что в районном центре Рамитан многие домохозяйства вынесли свои септики за территорию своего придомового участка. Большинство из них устроены вдоль дорог и находятся на территории, которая находится в ведении Управления благоустройства.

Представитель районного кадастра сказал присутствующим, что на территории города имеется много строений, построенных населением на участках, которые им не принадлежат, и большая часть этих строений не имеет каких-либо кадастровых документов. Согласно законодательству Узбекистана, предусмотрено, что перемещение и снос таких сооружений должен осуществляться за счет собственника недвижимости.

Председатель МСГ проинформировал участников сельского схода об инициативах Правительства Узбекистана о разработке долгосрочной программы по увеличению предоставления качественных услуг водоснабжения и канализации населению, укреплению институциональной базы и физической инфраструктуры действующих эксплуатирующих организаций, улучшению санитарно-экологической обстановки в регионах Республики. В целях реализации данной программы Правительство РУ получила финансирование от Азиатского банка инфраструктурных инвестиций (АБИИ) на модернизацию систем водоснабжения и канализации для повышения уровня жизни и благосостояния населения Бухарской области. В частности, районный центр Рамитан, был включен в проект «Развитие и модернизация систем канализации в районных центрах Гиждуван, Рамитан, Каракуль, Алат и Караулбазар (I приоритет)».

Директор филиала АО «Бухаро Сувтаминот» Рамитанского района проинформировал присутствующих что в Рамитане предусматривается строительство канализационных сетей, канализационных насосных станций и станции по очистке сточных вод. Протяжённость канализационных сетей будет составлять 102 км. Планируется 100% подключение домохозяйств к будущей централизованной канализации. Домохозяйства будут подключаться к централизованной канализации через колодцы. В один колодец будут подключены по несколько домохозяйств. Домохозяйства должны самостоятельно подключаться к центральной канализации по мере ее строительства. Далее директор сообщил, что большая часть канализационных труб планируется уложить вдоль дорог. А так как в городе многие улицы узкие, то некоторые частные септики будут мешать ходу строительства. Чьи именно септики в будущем помешают строительству, в настоящее время, сказать сложно. Поэтому все домохозяйства, чьи септики находятся за пределами границ домохозяйства, должны быть готовы отключить систему водоотведения своего домохозяйства от своих септиков или демонтировать их и перенести на время строительства на территорию своего домохозяйства.

Председатель МСГ, обращаясь к присутствующим сказал, что до поры до времени, все «закрывали глаза» на то, что частные септики находятся на общественной территории (за пределами границ участков домохозяйств), и что эти домохозяйства нарушают законодательство. Однако пришло время навести порядок в вопросе места устройства частных септиков. Правительство Узбекистана позаботилось о жителях нашего районного центра. Поэтому мы не должны чинить препятствий строительству централизованной канализации в нашем городе. Все домохозяйства, чьи септики находятся за пределами территории своего домовладения, должны устроить септики на территории своего придомового участка. И перенос септиков эти домохозяйства должны выполнить за свой счет.

Директор филиала АО «Бухаро Сувтаминот» Рамитанского района пояснил, что перенос септиков с общественной территории на участок собственного домовладения будет временной мерой. Как только канализационная сеть будет построена, они должны будут подключиться к построенным колодцам централизованной канализации. Поэтому процесс переноса септиков на территорию домохозяйства можно осуществить накануне строительных работ, когда уже точно будет известно, чьи септики попадают в зону прокладки траншеи.

Выступление с мест участников схода граждан.

1. Этот проект очень необходим и выгоден для нас. И нам повезло, что наш город был включен в проект. Поэтому мы поддерживаем реализацию этого проекта. Мы

все хотим, чтобы уровень и качество жизни жителей махаллей улучшились. Мы понимаем, что многие наши септики незаконно находятся за пределами территории индивидуального частного домовладения. Поэтому мы согласны на перенос незаконно построенных сооружений на свои придомовые участки за свой счет.

2. Мой септик находится прямо вдоль дороги. У меня небольшой двор и огород. Можно я уберу свой септик, когда начнутся строительные работы на нашей улице. Пока будут идти строительные работы, я сделаю или куплю емкость, куда временно будут собираться все стоки с моего домохозяйства. Я тоже поддерживаю проект.
3. Сегодня на сходе граждан присутствуют не все жители нашей махали. Поэтому те, кто присутствуют здесь сегодня, должны донести информацию отсутствующим. Самое главное, они должны понять, что если их септик будет мешать строительным работам, то он должен за свой счет временно перенести септик на территории своего домохозяйства. А когда будет построена сеть и колодцы, они должны будут подключиться к централизованной канализации.
4. На каждой улице необходимо выбрать активистов, которые будут помогать Махаллинскому комитету в процессе переноса септиков, которые будут мешать строительным работам, на территорию частных домовладений.
5. Необходимо собрать заявления от каждого владельца домохозяйства, чьи септики находятся за пределами частного домовладения, что они сами за свой счет перенесут септики на территорию своего домовладения до начала строительных работ.

По итогам выступлений на махаллинском сходе граждан было составлено Постановление, которое было зачитано присутствующим.

ПОСТАНОВЛЕНИЕ:

1. Участники схода поддерживают проект по строительству централизованной канализации в городе Рамитан в Бухарской области. Участники осведомлены, что будут построены канализационные сети, КНС и Канализационные очистные сооружения.
2. Участники понимают необходимость переноса своих септиков, находящиеся на общественной территории, на территорию своего домовладения.
3. Домохозяйства, чьи септики находятся за пределами частного домовладения, должны написать заявление о том, что они перенесут свои септики за счет собственных средств.
4. Ответственность за сбор заявлений от домохозяйств возлагается на Махаллинский комитет. В целях оптимизации документооборота заявления от домохозяйств лучше сделать в табличной форме.
5. Когда будет построена централизованная канализация, все домохозяйства махалли должны подключиться к ней.
6. Данный протокол вывесить в здании Махаллинского комитета для всеобщего информирования.
7. Список участков данного махаллинского схода и Заявления от домохозяйств о переносе своих септиков за свой счет до начала строительных работу, являются неотъемлемой частью Протокола.

Итоги голосования за Постановление схода граждан махали“_____”

За _____
Против _____
Воздержавшиеся _____

Секретарь собрания ФИО _____

Председатель собрания ФИО Гуссухова

***Протокол составить и подписать в 2 экз.** для: МСГ, хокимиат, ООО «Бухаро сувтаминот», районного филиала ООО «Бухаро Сувтаминот», ГКП, Nicholas O'Dwyer Ltd.*

«Утверждаю»
Председатель МСГ А. Новый
Рамитанского
района Бухарской области
Файзиев Толмас
«17» август 2024 г.

«17» августа 2024 года

ПРОТОКОЛ

Проведение махалинского схода граждан «Афросиев» районного центра Рамитан по подготовке к реализации проекта «Развитие и модернизация систем водоснабжения и канализации Бухарской области (Фаза-1, Компонент -2: Канализация)»

р/ц Рамитан

Председатель собрания: Файзиев Т – Председатель МСГ «А.Новый»

Присутствовали члены кенгаша МСГ «А.Новый», активисты махали, представители местных органов власти, социальных учреждений и филиала ООО «Бухаро Сувтаминот».
Всего присутствовало 11 человек (Список прилагается).

Собрание МСГ проходило в МСГ Афросиаб А.Новый

Сельский сход граждан МСГ «А.Новый» проходил во исполнение и в соответствии с законодательством Республики Узбекистан: ЗАКОН РЕСПУБЛИКИ УЗБЕКИСТАН за №393 «САНИТАРНО-ЭПИДЕМИОЛОГИЧЕСКОМ БЛАГОПОЛУЧИИ НАСЕЛЕНИЯ» от 26.08.20215 года, ПОСТАНОВЛЕНИЕ ПРЕЗИДЕНТА РЕСПУБЛИКИ УЗБЕКИСТАН «О МЕРАХ ПО СОВЕРШЕНСТВОВАНИЮ ПОРЯДКА ВЫДЕЛЕНИЯ ЗЕМЕЛЬНЫХ УЧАСТКОВ ДЛЯ ИНЖЕНЕРНО-КОММУНИКАЦИОННЫХ СЕТЕЙ» ПП-204 от 12.04.2022 года, ПОСТАНОВЛЕНИК КАБИНЕТА МИНИСТРОВ РЕСПУБЛИКИ УЗБЕКИСТАН «ОБ УТВЕРЖДЕНИИ ПОЛОЖЕНИЯ ОБ ИНДИВИДУАЛЬНОМ ЖИЛИЩНОМ СТРОИТЕЛЬСТВЕ», ПОСТАНОВЛЕНИЕ КАБИНЕТА МИНИСТРОВ РЕСПУБЛИКИ УЗБЕКИСТАН «О ДАЛЬНЕЙШЕМ СОВЕРШЕНСТВОВАНИИ МЕХАНИЗМА ОЦЕНКИ ВОЗДЕЙСТВИЯ НА ОКРУЖАЮЩУЮ СРЕДУ» за №541 от 07.09.2020 года, ПОСТАНОВЛЕНИЕ КАБИНЕТА МИНИСТРОВ «О МЕРАХ ПО РЕАЛИЗАЦИИ ПРОЕКТА «РАЗВИТИЕ И МОДЕРНИЗАЦИЯ СИСТЕМ ВОДОСНАБЖЕНИЯ И КАНАЛИЗАЦИИ БУХАРСКОЙ ОБЛАСТИ» С УЧАСТИЕМ АЗИАТСКОГО БАНКА ИНФРАСТРУКТУРНЫХ ИНВЕСТИЦИЙ» ПКМ-482 от 12.08.2023 года.

Представитель Санитарно-эпидемиологического службы Рамитанского района проинформировал участников, что текущая санитарно-эпидемиологическая обстановка и неадекватная существующая санитарная инфраструктура являются одними из основных причин заболеваний населения инфекционными и паразитарными заболеваниями. Смертность от инфекционных и паразитарных заболеваний занимает второе место после заболеваний сердечно-сосудистой системы. От инфекционных и паразитарных

заболеваний особенно страдают дети и женщины. Представитель Сан-эпид. надзора напомнила присутствующим, что в соответствии с Законом РУ «О санитарно-эпидемиологическом благополучии населения» органы самоуправления граждан должны «Осуществлять общественный контроль на соответствующей территории за реализацией мероприятий в области санитарно-эпидемиологического благополучия населения, соблюдением правил застройки и содержания дворовых и придомовых территорий (статья 14). А граждане обязаны соблюдать требования законодательства о санитарно-эпидемиологическом благополучии населения и не допускать действий, влекущих за собой нарушения прав других граждан на охрану здоровья и благоприятную среду обитания (статья 17). Кроме того, текущая санитарная практика на уровне домохозяйств и водоотведение снижают качество жизни и уровень благоустройства индивидуального жилья.

Начальник районного отдела экологии и охраны окружающей среды, проинформировал присутствующих, что существующая практика санитарии и водоотведения ведет к загрязнению окружающей среды и грунтовых вод. В условиях роста дефицита воды загрязнение грунтовых и поверхностных вод создает опасность для жизнедеятельности населения и будущих поколений.

Представитель управления Благоустройства хокимиата Рамитанского района проинформировал участников схода о том, что в целях упорядочения индивидуального жилищного строительства Кабинет Министров РУ (ПКМ № 272 от 30 декабря 2006 г.) утвердил «Положение об индивидуальном жилищном строительстве», согласно которому «Самовольной постройкой считаются жилые дома, другие строения и сооружения или иное недвижимое имущество, построенные застройщиками на земельных участках, не отведенных для этих целей в порядке, установленном законодательством, а также возведенные без получения на это необходимого разрешения либо с существенным нарушением градостроительных норм и правил (статья 33 Положения).

Представитель районного управления архитектуры сообщил участникам схода, что в соответствии со статьями 34 и 35 «Положения об индивидуальном жилищном строительстве», утверждённого Постановлением Кабинет Министров № 272 от 30 декабря 2006 г. «В случае обнаружения самовольной постройки должностными лицами органов архитектуры и строительства районов (городов) составляется акт о факте самовольной постройки. Одновременно с составлением акта должностными лицами органов архитектуры и строительства районов (городов) выдается предписание о приостановлении самовольной постройки. Копия предписания представляется в хокимият района (города) для дальнейшего решения вопроса по самовольно возведенному строению в установленном порядке.». Архитектор обратил внимание присутствующих на тот факт, что в районном центре Рамитан многие домохозяйства вынесли свои септики за территорию своего придомового участка. Большинство из них устроены вдоль дорог и находятся на территории, которая находится в ведении Управления благоустройства.

Представитель районного кадастра сказал присутствующим, что на территории города имеется много строений, построенных населением на участках, которые им не принадлежат, и большая часть этих строений не имеет каких-либо кадастровых документов. Согласно законодательству Узбекистана, предусмотрено, что перемещение и снос таких сооружений должен осуществляться за счет собственника недвижимости.

Председатель МСГ проинформировал участников сельского схода об инициативах Правительства Узбекистана о разработке долгосрочной программы по увеличению предоставления качественных услуг водоснабжения и канализации населению, укреплению институциональной базы и физической инфраструктуры действующих эксплуатирующих организаций, улучшению санитарно-экологической обстановки в регионах Республики. В целях реализации данной программы Правительство РУ получила финансирование от Азиатского банка инфраструктурных инвестиций (АБИИ) на модернизацию систем водоснабжения и канализации для повышения уровня жизни и благосостояния населения Бухарской области. В частности, районный центр Рамитан, был включен в проект «Развитие и модернизация систем канализации в районных центрах Гиждуван, Рамитан, Каракуль, Алат и Караулбазар (I приоритет)».

Директор филиала АО «Бухаро Сувтаминот» Рамитанского района проинформировал присутствующих что в Рамитане предусматривается строительство канализационных сетей, канализационных насосных станций и станции по очистке сточных вод. Протяжённость канализационных сетей будет составлять 102 км. Планируется 100% подключение домохозяйств к будущей централизованной канализации. Домохозяйства будут подключаться к централизованной канализации через колодцы. В один колодец будут подключены по несколько домохозяйств. Домохозяйства должны самостоятельно подключаться к центральной канализации по мере ее строительства. Далее директор сообщил, что большая часть канализационных труб планируется уложить вдоль дорог. А так как в городе многие улицы узкие, то некоторые частные септики будут мешать ходу строительства. Чьи именно септики в будущем помешают строительству, в настоящее время, сказать сложно. Поэтому все домохозяйства, чьи септики находятся за пределами границ домохозяйства, должны быть готовы отключить систему водоотведения своего домохозяйства от своих септиков или демонтировать их и перенести на время строительства на территорию своего домохозяйства.

Председатель МСГ, обращаясь к присутствующим сказал, что до поры до времени, все «закрывали глаза» на то, что частные септики находятся на общественной территории (за пределами границ участков домохозяйств), и что эти домохозяйства нарушают законодательство. Однако пришло время навести порядок в вопросе места устройства частных септиков. Правительство Узбекистана позаботилось о жителях нашего районного центра. Поэтому мы не должны чинить препятствий строительству централизованной канализации в нашем городе. Все домохозяйства, чьи септики находятся за пределами территории своего домовладения, должны устроить септики на территории своего придомового участка. И перенос септиков эти домохозяйства должны выполнить за свой счет.

Директор филиала АО «Бухаро Сувтаминот» Рамитанского района пояснил, что перенос септиков с общественной территории на участок собственного домовладения будет временной мерой. Как только канализационная сеть будет построена, они должны будут подключиться к построенным колодцам централизованной канализации. Поэтому процесс переноса септиков на территорию домохозяйства можно осуществить накануне строительных работ, когда уже точно будет известно, чьи септики попадают в зону прокладки траншеи.

Выступление с мест участников схода граждан.

1. Этот проект очень необходим и выгоден для нас. И нам повезло, что наш город был включен в проект. Поэтому мы поддерживаем реализацию этого проекта. Мы

все хотим, чтобы уровень и качество жизни жителей махаллей улучшились. Мы понимаем, что многие наши септики незаконно находятся за пределами территории индивидуального частного домовладения. Поэтому мы согласны на перенос незаконно построенных сооружений на свои придомовые участки за свой счет.

2. Мой септик находится прямо вдоль дороги. У меня небольшой двор и огород. Можно я уберу свой септик, когда начнутся строительные работы на нашей улице. Пока будут идти строительные работы, я сделаю или куплю емкость, куда временно будут собираться все стоки с моего домохозяйства. Я тоже поддерживаю проект.
3. Сегодня на сходе граждан присутствуют не все жители нашей махали. Поэтому те, кто присутствуют здесь сегодня, должны донести информацию отсутствующим. Самое главное, они должны понять, что если их септик будет мешать строительным работам, то он должен за свой счет временно перенести септик на территории своего домохозяйства. А когда будет построена сеть и колодцы, они должны будут подключиться к централизованной канализации.
4. На каждой улице необходимо выбрать активистов, которые будут помогать Махаллинскому комитету в процессе переноса септиков, которые будут мешать строительным работам, на территорию частных домовладений.
5. Необходимо собрать заявления от каждого владельца домохозяйства, чьи септики находятся за пределами частного домовладения, что они сами за свой счет перенесут септики на территорию своего домовладения до начала строительных работ.

По итогам выступлений на махаллинском сходе граждан было составлено Постановление, которое было зачитано присутствующим.

ПОСТАНОВЛЕНИЕ:

1. Участники схода поддерживают проект по строительству централизованной канализации в городе Рамитан в Бухарской области. Участники осведомлены, что будут построены канализационные сети, КНС и Канализационные очистные сооружения.
2. Участники понимают необходимость переноса своих септиков, находящиеся на общественной территории, на территорию своего домовладения.
3. Домохозяйства, чьи септики находятся за пределами частного домовладения, должны написать заявление о том, что они перенесут свои септики за счет собственных средств.
4. Ответственность за сбор заявлений от домохозяйств возлагается на Махаллинский комитет. В целях оптимизации документооборота заявления от домохозяйств лучше сделать в табличной форме.
5. Когда будет построена централизованная канализация, все домохозяйства махалли должны подключиться к ней.
6. Данный протокол вывесить в здании Махаллинского комитета для всеобщего информирования.
7. Список участков данного махаллинского схода и Заявления от домохозяйств о переносе своих септиков за свой счет до начала строительных работу, являются неотъемлемой частью Протокола.

Итоги голосования за Постановление схода граждан махали“_____”

За 11
Против -
Воздержавшиеся -

Секретарь собрания ФИО Олимов Р. О

Председатель собрания ФИО Фатдиев

Протокол составить и подписать в 2 экз. *для: МСГ, хокимиат, ООО «Бухаро сувтаминот», районного филиала ООО «Бухаро Сувтаминот», ГКП, Nicholas O'Dwyer Ltd.*

Список участников

Общественнй консультации по проекту Проекта «Развитие и модернизация систем водоснабжения и канализации Бухарской области (Фаза-1, Компонент-2: Канализация)» районного центра Рамитан

Дата: 17.08

Место проведения: МСГ А.Навоий

№	Ф.И.О	Организация	Должность	Телефон	Подпись
1	Баҳоев Барака	А.Навоий МФЙ	МФЙ фаоли вакил	94-321-47-42	
2	Аминов Сохиб	А.Навоий МФЙ	нафақахўр	93-651-24-81	
3	Шодиев Шермат	А.Навоий МФЙ	нафақахўр	93-624-66-27	
4	Кучанов Илҳом	А.Навоий МФЙ	ишчи	94-249-00-25	
5	Файзуев Толқин	А.Навоий МФЙ	МФЙ раиси	94-241-24-42	

6	Файбуллаев Ғайрат	А. Навоий МФЙ	Қонун ёрдамчиси	94-549-52-97	
7	Самадов Комил	А. Навоий МФЙ	МИБ ходими	94-248 8998	
8	Ядгарова Гулбахор	А. Навоий МФЙ	пенсионер	99 739 1705	
9	Каримова Садокат	А. Навоий МФЙ	пенсияда	93 621 05 17	
10	Тошева Мехри	А. Навоий МФЙ	ҳотин-қизлар фаоли	96-879-30-05	
11	Салимов Саидбек	А. Навоий МФЙ	ёшлар етакчиси	93-687 00 10	
12					
13					
14					

«Утверждаю»
Председатель МСГ «Тарнаут»
Рамитанского
района Бухарской области

Азимов Камил.
«16» 08. 2024 г.

«16» августа 2024 года

ПРОТОКОЛ

Проведение махалинского схода граждан «Тарнаут» районного центра Рамитан по подготовке к реализации проекта «Развитие и модернизация систем водоснабжения и канализации Бухарской области (Фаза-1, Компонент -2: Канализация)»

р/ц Рамитан

Председатель собрания: К. Азимов – Председатель МСГ «Тарнаут».

Присутствовали члены кенгаша МСГ «Тарнаут», активисты махали, представители местных органов власти, социальных учреждений и филиала ООО «Бухаро Сувтаминот».
Всего присутствовало 12 человек (Список прилагается).

Собрание МСГ проходило в здание МСГ „Тарнаут"

Сельский сход граждан МСГ «Тарнаут» проходил во исполнение и в соответствии с законодательством Республики Узбекистан: ЗАКОН РЕСПУБЛИКИ УЗБЕКИСТАН за №393 «САНИТАРНО-ЭПИДЕМИОЛОГИЧЕСКОМ БЛАГОПОЛУЧИИ НАСЕЛЕНИЯ» от 26.08.20215 года, ПОСТАНОВЛЕНИЕ ПРЕЗИДЕНТА РЕСПУБЛИКИ УЗБЕКИСТАН «О МЕРАХ ПО СОВЕРШЕНСТВОВАНИЮ ПОРЯДКА ВЫДЕЛЕНИЯ ЗЕМЕЛЬНЫХ УЧАСТКОВ ДЛЯ ИНЖЕНЕРНО-КОММУНИКАЦИОННЫХ СЕТЕЙ» ПП-204 от 12.04.2022 года, ПОСТАНОВЛЕНИК КАБИНЕТА МИНИСТРОВ РЕСПУБЛИКИ УЗБЕКИСТАН «ОБ УТВЕРЖДЕНИИ ПОЛОЖЕНИЯ ОБ ИНДИВИДУАЛЬНОМ ЖИЛИЩНОМ СТРОИТЕЛЬСТВЕ», ПОСТАНОВЛЕНИЕ КАБИНЕТА МИНИСТРОВ РЕСПУБЛИКИ УЗБЕКИСТАН «О ДАЛЬНЕЙШЕМ СОВЕРШЕНСТВОВАНИИ МЕХАНИЗМА ОЦЕНКИ ВОЗДЕЙСТВИЯ НА ОКРУЖАЮЩУЮ СРЕДУ» за №541 от 07.09.2020 года, ПОСТАНОВЛЕНИЕ КАБИНЕТА МИНИСТРОВ «О МЕРАХ ПО РЕАЛИЗАЦИИ ПРОЕКТА «РАЗВИТИЕ И МОДЕРНИЗАЦИЯ СИСТЕМ ВОДОСНАБЖЕНИЯ И КАНАЛИЗАЦИИ БУХАРСКОЙ ОБЛАСТИ» С УЧАСТИЕМ АЗИАТСКОГО БАНКА ИНФРАСТРУКТУРНЫХ ИНВЕСТИЦИЙ» ПКМ-482 от 12.08.2023 года.

Представитель Санитарно-эпидемиологического службы Рамитанского района проинформировал участников, что текущая санитарно-эпидемиологическая обстановка и неадекватная существующая санитарная инфраструктура являются одними из основных причин заболеваний населения инфекционными и паразитарными заболеваниями. Смертность от инфекционных и паразитарных заболеваний занимает второе место после заболеваний сердечно-сосудистой системы. От инфекционных и паразитарных

заболеваний особенно страдают дети и женщины. Представитель Сан-эпид. надзора напомнила присутствующим, что в соответствии с Законом РУ «О санитарно-эпидемиологическом благополучии населения» органы самоуправления граждан должны «Осуществлять общественный контроль на соответствующей территории за реализацией мероприятий в области санитарно-эпидемиологического благополучия населения, соблюдением правил застройки и содержания дворовых и придомовых территорий (статья 14). А граждане обязаны соблюдать требования законодательства о санитарно-эпидемиологическом благополучии населения и не допускать действий, влекущих за собой нарушения прав других граждан на охрану здоровья и благоприятную среду обитания (статья 17). Кроме того, текущая санитарная практика на уровне домохозяйств и водоотведение снижают качество жизни и уровень благоустройства индивидуального жилья.

Начальник районного отдела экологии и охраны окружающей среды, проинформировал присутствующих, что существующая практика санитарии и водоотведения ведет к загрязнению окружающей среды и грунтовых вод. В условиях роста дефицита воды загрязнение грунтовых и поверхностных вод создает опасность для жизнедеятельности населения и будущих поколений.

Представитель управления Благоустройства хокимиата Рамитанского района проинформировал участников схода о том, что в целях упорядочения индивидуального жилищного строительства Кабинет Министров РУ (ПКМ № 272 от 30 декабря 2006 г.) утвердил «Положение об индивидуальном жилищном строительстве», согласно которому «Самовольной постройкой считаются жилые дома, другие строения и сооружения или иное недвижимое имущество, построенные застройщиками на земельных участках, не отведенных для этих целей в порядке, установленном законодательством, а также возведенные без получения на это необходимого разрешения либо с существенным нарушением градостроительных норм и правил (статья 33 Положения).

Представитель районного управления архитектуры сообщил участникам схода, что в соответствии со статьями 34 и 35 «Положения об индивидуальном жилищном строительстве», утверждённого Постановлением Кабинет Министров № 272 от 30 декабря 2006 г. «В случае обнаружения самовольной постройки должностными лицами органов архитектуры и строительства районов (городов) составляется акт о факте самовольной постройки. Одновременно с составлением акта должностными лицами органов архитектуры и строительства районов (городов) выдается предписание о приостановлении самовольной постройки. Копия предписания представляется в хокимият района (города) для дальнейшего решения вопроса по самовольно возведенному строению в установленном порядке.». Архитектор обратил внимание присутствующих на тот факт, что в районном центре Рамитан многие домохозяйства вынесли свои септики за территорию своего придомового участка. Большинство из них устроены вдоль дорог и находятся на территории, которая находится в ведении Управления благоустройства.

Представитель районного кадастра сказал присутствующим, что на территории города имеется много строений, построенных населением на участках, которые им не принадлежат, и большая часть этих строений не имеет каких-либо кадастровых документов. Согласно законодательству Узбекистана, предусмотрено, что перемещение и снос таких сооружений должен осуществляться за счет собственника недвижимости.

Председатель МСГ проинформировал участников сельского схода об инициативах Правительства Узбекистана о разработке долгосрочной программы по увеличению предоставления качественных услуг водоснабжения и канализации населению, укреплению институциональной базы и физической инфраструктуры действующих эксплуатирующих организаций, улучшению санитарно-экологической обстановки в регионах Республики. В целях реализации данной программы Правительство РУ получила финансирование от Азиатского банка инфраструктурных инвестиций (АБИИ) на модернизацию систем водоснабжения и канализации для повышения уровня жизни и благосостояния населения Бухарской области. В частности, районный центр Рамитан, был включен в проект «Развитие и модернизация систем канализации в районных центрах Гиждуван, Рамитан, Каракуль, Алат и Караулбазар (I приоритет)».

Директор филиала АО «Бухаро Сувтаминот» Рамитанского района проинформировал присутствующих что в Рамитане предусматривается строительство канализационных сетей, канализационных насосных станций и станции по очистке сточных вод. Протяжённость канализационных сетей будет составлять 102 км. Планируется 100% подключение домохозяйств к будущей централизованной канализации. Домохозяйства будут подключаться к централизованной канализации через колодцы. В один колодец будут подключены по несколько домохозяйств. Домохозяйства должны самостоятельно подключаться к центральной канализации по мере ее строительства. Далее директор сообщил, что большая часть канализационных труб планируется уложить вдоль дорог. А так как в городе многие улицы узкие, то некоторые частные септики будут мешать ходу строительства. Чьи именно септики в будущем помешают строительству, в настоящее время, сказать сложно. Поэтому все домохозяйства, чьи септики находятся за пределами границ домохозяйства, должны быть готовы отключить систему водоотведения своего домохозяйства от своих септиков или демонтировать их и перенести на время строительства на территорию своего домохозяйства.

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Директор филиала АО «Бухаро Сувтаминот» Рамитанского района пояснил, что перенос септиков с общественной территории на участок собственного домовладения будет временной мерой. Как только канализационная сеть будет построена, они должны будут подключиться к построенным колодцам централизованной канализации. Поэтому процесс переноса септиков на территорию домохозяйства можно осуществить накануне строительных работ, когда уже точно будет известно, чьи септики попадают в зону прокладки траншеи.

Выступление с мест участников схода граждан.

1. Этот проект очень необходим и выгоден для нас. И нам повезло, что наш город был включен в проект. Поэтому мы поддерживаем реализацию этого проекта. Мы

все хотим, чтобы уровень и качество жизни жителей махаллей улучшились. Мы понимаем, что многие наши септики незаконно находятся за пределами территории индивидуального частного домовладения. Поэтому мы согласны на перенос незаконно построенных сооружений на свои придомовые участки за свой счет.

2. Мой септик находится прямо вдоль дороги. У меня небольшой двор и огород. Можно я уберу свой септик, когда начнутся строительные работы на нашей улице. Пока будут идти строительные работы, я сделаю или куплю емкость, куда временно будут собираться все стоки с моего домохозяйства. Я тоже поддерживаю проект.
3. Сегодня на сходе граждан присутствуют не все жители нашей махали. Поэтому те, кто присутствуют здесь сегодня, должны донести информацию отсутствующим. Самое главное, они должны понять, что если их септик будет мешать строительным работам, то он должен за свой счет временно перенести септик на территории своего домохозяйства. А когда будет построена сеть и колодцы, они должны будут подключиться к централизованной канализации.
4. На каждой улице необходимо выбрать активистов, которые будут помогать Махаллинскому комитету в процессе переноса септиков, которые будут мешать строительным работам, на территорию частных домовладений.
5. Необходимо собрать заявления от каждого владельца домохозяйства, чьи септики находятся за пределами частного домовладения, что они сами за свой счет перенесут септики на территорию своего домовладения до начала строительных работ.

По итогам выступлений на махаллинском сходе граждан было составлено Постановление, которое было зачитано присутствующим.

ПОСТАНОВЛЕНИЕ:

1. Участники схода поддерживают проект по строительству централизованной канализации в городе Рамитан в Бухарской области. Участники осведомлены, что будут построены канализационные сети, КНС и Канализационные очистные сооружения.
2. Участники понимают необходимость переноса своих септиков, находящиеся на общественной территории, на территорию своего домовладения.
3. Домохозяйства, чьи септики находятся за пределами частного домовладения, должны написать заявление о том, что они перенесут свои септики за счет собственных средств.
4. Ответственность за сбор заявлений от домохозяйств возлагается на Махаллинский комитет. В целях оптимизации документооборота заявления от домохозяйств лучше сделать в табличной форме.
5. Когда будет построена централизованная канализация, все домохозяйства махалли должны подключиться к ней.
6. Данный протокол вывесить в здании Махаллинского комитета для всеобщего информирования.
7. Список участков данного махаллинского схода и Заявления от домохозяйств о переносе своих септиков за свой счет до начала строительных работу, являются неотъемлемой частью Протокола.

Итоги голосования за Постановление схода граждан махали“ Тамшут **”**

За 12
Против 0
Воздержавшиеся 0

Секретарь собрания ФИО Ф. Омонов

Председатель собрания ФИО К. Аминов

Протокол составить и подписать в 2 экз. *для: МСГ, хокимиат, ООО «Бухаро сувтаминот», районного филиала ООО «Бухаро Сувтаминот», ГКП, Nicholas O'Dwyer Ltd.*

«Утверждаю»
Председатель МСГ Гулистон
Рамитанского
района Бухарской области
_____ Хамроева Мехринисо
«16» август 2024 г.

«16» августа 2024 года

ПРОТОКОЛ

Проведение махалинского схода граждан «Гулистан» районного центра Рамитан по подготовке к реализации проекта «Развитие и модернизация систем водоснабжения и канализации Бухарской области (Фаза-1, Компонент -2: Канализация)»

р/ц Рамитан

Председатель собрания: Хамроева М – Председатель МСГ «Гулистан»

Присутствовали члены кенгаша МСГ «Гулистон», активисты махали, представители местных органов власти, социальных учреждений и филиала ООО «Бухаро Сувтаминот».
Всего присутствовало 12 человек (Список прилагается).

Собрание МСГ проходило в МСГ Гулистан

Сельский сход граждан МСГ «Гулистан» проходил во исполнение и в соответствии с законодательством Республики Узбекистан: ЗАКОН РЕСПУБЛИКИ УЗБЕКИСТАН за №393 «САНИТАРНО-ЭПИДЕМИОЛОГИЧЕСКОМ БЛАГОПОЛУЧИИ НАСЕЛЕНИЯ» от 26.08.20215 года, ПОСТАНОВЛЕНИЕ ПРЕЗИДЕНТА РЕСПУБЛИКИ УЗБЕКИСТАН «О МЕРАХ ПО СОВЕРШЕНСТВОВАНИЮ ПОРЯДКА ВЫДЕЛЕНИЯ ЗЕМЕЛЬНЫХ УЧАСТКОВ ДЛЯ ИНЖЕНЕРНО-КОММУНИКАЦИОННЫХ СЕТЕЙ» ПП-204 от 12.04.2022 года, ПОСТАНОВЛЕНИК КАБИНЕТА МИНИСТРОВ РЕСПУБЛИКИ УЗБЕКИСТАН «ОБ УТВЕРЖДЕНИИ ПОЛОЖЕНИЯ ОБ ИНДИВИДУАЛЬНОМ ЖИЛИЩНОМ СТРОИТЕЛЬСТВЕ», ПОСТАНОВЛЕНИЕ КАБИНЕТА МИНИСТРОВ РЕСПУБЛИКИ УЗБЕКИСТАН «О ДАЛЬНЕЙШЕМ СОВЕРШЕНСТВОВАНИИ МЕХАНИЗМА ОЦЕНКИ ВОЗДЕЙСТВИЯ НА ОКРУЖАЮЩУЮ СРЕДУ» за №541 от 07.09.2020 года, ПОСТАНОВЛЕНИЕ КАБИНЕТА МИНИСТРОВ «О МЕРАХ ПО РЕАЛИЗАЦИИ ПРОЕКТА «РАЗВИТИЕ И МОДЕРНИЗАЦИЯ СИСТЕМ ВОДОСНАБЖЕНИЯ И КАНАЛИЗАЦИИ БУХАРСКОЙ ОБЛАСТИ» С УЧАСТИЕМ АЗИАТСКОГО БАНКА ИНФРАСТРУКТУРНЫХ ИНВЕСТИЦИЙ» ПКМ-482 от 12.08.2023 года.

Представитель Санитарно-эпидемиологического службы Рамитанского района проинформировал участников, что текущая санитарно-эпидемиологическая обстановка и неадекватная существующая санитарная инфраструктура являются одними из основных причин заболеваний населения инфекционными и паразитарными заболеваниями. Смертность от инфекционных и паразитарных заболеваний занимает второе место после заболеваний сердечно-сосудистой системы. От инфекционных и паразитарных

заболеваний особенно страдают дети и женщины. Представитель Сан-эпид. надзора напомнила присутствующим, что в соответствии с Законом РУ «О санитарно-эпидемиологическом благополучии населения» органы самоуправления граждан должны «Осуществлять общественный контроль на соответствующей территории за реализацией мероприятий в области санитарно-эпидемиологического благополучия населения, соблюдением правил застройки и содержания дворовых и придомовых территорий (статья 14). А граждане обязаны соблюдать требования законодательства о санитарно-эпидемиологическом благополучии населения и не допускать действий, влекущих за собой нарушения прав других граждан на охрану здоровья и благоприятную среду обитания (статья 17). Кроме того, текущая санитарная практика на уровне домохозяйств и водоотведение снижают качество жизни и уровень благоустройства индивидуального жилья.

Начальник районного отдела экологии и охраны окружающей среды, проинформировал присутствующих, что существующая практика санитарии и водоотведения ведет к загрязнению окружающей среды и грунтовых вод. В условиях роста дефицита воды загрязнение грунтовых и поверхностных вод создает опасность для жизнедеятельности населения и будущих поколений.

Представитель управления Благоустройства хокимиата Рамитанского района проинформировал участников схода о том, что в целях упорядочения индивидуального жилищного строительства Кабинет Министров РУ (ПКМ № 272 от 30 декабря 2006 г.) утвердил «Положение об индивидуальном жилищном строительстве», согласно которому «Самовольной постройкой считаются жилые дома, другие строения и сооружения или иное недвижимое имущество, построенные застройщиками на земельных участках, не отведенных для этих целей в порядке, установленном законодательством, а также возведенные без получения на это необходимого разрешения либо с существенным нарушением градостроительных норм и правил (статья 33 Положения).

Представитель районного управления архитектуры сообщил участникам схода, что в соответствии со статьями 34 и 35 «Положения об индивидуальном жилищном строительстве», утверждённого Постановлением Кабинет Министров № 272 от 30 декабря 2006 г. «В случае обнаружения самовольной постройки должностными лицами органов архитектуры и строительства районов (городов) составляется акт о факте самовольной постройки. Одновременно с составлением акта должностными лицами органов архитектуры и строительства районов (городов) выдается предписание о приостановлении самовольной постройки. Копия предписания представляется в хокимият района (города) для дальнейшего решения вопроса по самовольно возведенному строению в установленном порядке.». Архитектор обратил внимание присутствующих на тот факт, что в районном центре Рамитан многие домохозяйства вынесли свои септики за территорию своего придомового участка. Большинство из них устроены вдоль дорог и находятся на территории, которая находится в ведении Управления благоустройства.

Представитель районного кадастра сказал присутствующим, что на территории города имеется много строений, построенных населением на участках, которые им не принадлежат, и большая часть этих строений не имеет каких-либо кадастровых документов. Согласно законодательству Узбекистана, предусмотрено, что перемещение и снос таких сооружений должен осуществляться за счет собственника недвижимости.

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Директор филиала АО «Бухаро Сувтаминот» Рамитанского района пояснил, что перенос септиков с общественной территории на участок собственного домовладения будет временной мерой. Как только канализационная сеть будет построена, они должны будут подключиться к построенным колодцам централизованной канализации. Поэтому процесс переноса септиков на территорию домохозяйства можно осуществить накануне строительных работ, когда уже точно будет известно, чьи септики попадают в зону прокладки траншеи.

Выступление с мест участников схода граждан.

1. Этот проект очень необходим и выгоден для нас. И нам повезло, что наш город был включен в проект. Поэтому мы поддерживаем реализацию этого проекта. Мы

все хотим, чтобы уровень и качество жизни жителей махаллей улучшились. Мы понимаем, что многие наши септики незаконно находятся за пределами территории индивидуального частного домовладения. Поэтому мы согласны на перенос незаконно построенных сооружений на свои придомовые участки за свой счет.

2. Мой септик находится прямо вдоль дороги. У меня небольшой двор и огород. Можно я уберу свой септик, когда начнутся строительные работы на нашей улице. Пока будут идти строительные работы, я сделаю или куплю емкость, куда временно будут собираться все стоки с моего домохозяйства. Я тоже поддерживаю проект.
3. Сегодня на сходе граждан присутствуют не все жители нашей махали. Поэтому те, кто присутствуют здесь сегодня, должны донести информацию отсутствующим. Самое главное, они должны понять, что если их септик будет мешать строительным работам, то он должен за свой счет временно перенести септик на территории своего домохозяйства. А когда будет построена сеть и колодцы, они должны будут подключиться к централизованной канализации.
4. На каждой улице необходимо выбрать активистов, которые будут помогать Махаллинскому комитету в процессе переноса септиков, которые будут мешать строительным работам, на территорию частных домовладений.
5. Необходимо собрать заявления от каждого владельца домохозяйства, чьи септики находятся за пределами частного домовладения, что они сами за свой счет перенесут септики на территорию своего домовладения до начала строительных работ.

По итогам выступлений на махаллинском сходе граждан было составлено Постановление, которое было зачитано присутствующим.

ПОСТАНОВЛЕНИЕ:

1. Участники схода поддерживают проект по строительству централизованной канализации в городе Рамитан в Бухарской области. Участники осведомлены, что будут построены канализационные сети, КНС и Канализационные очистные сооружения.
2. Участники понимают необходимость переноса своих септиков, находящиеся на общественной территории, на территорию своего домовладения.
3. Домохозяйства, чьи септики находятся за пределами частного домовладения, должны написать заявление о том, что они перенесут свои септики за счет собственных средств.
4. Ответственность за сбор заявлений от домохозяйств возлагается на Махаллинский комитет. В целях оптимизации документооборота заявления от домохозяйств лучше сделать в табличной форме.
5. Когда будет построена централизованная канализация, все домохозяйства махалли должны подключиться к ней.
6. Данный протокол вывесить в здании Махаллинского комитета для всеобщего информирования.
7. Список участков данного махаллинского схода и Заявления от домохозяйств о переносе своих септиков за свой счет до начала строительных работу, являются неотъемлемой частью Протокола.

Итоги голосования за Постановление схода граждан махали“ Гулистан **”**

За 12
Против 0
Воздержавшиеся 0

Секретарь собрания ФИО

Председатель собрания ФИО

***Протокол составить и подписать в 2 экз.** для: МСГ, хокимиат, ООО «Бухаро сувтаминот», районного филиала ООО «Бухаро Сувтаминот», ГКП, Nicholas O'Dwyer Ltd.*

Список участников

Общественнй консультации по проекту Проекта «Развитие и модернизация систем водоснабжения и канализации Бухарской области (Фаза-1, Компонент-2: Канализация)» районного центра Рамитан

Дата: 16 августа

Место проведения: МСГ Гулистан

№	Ф.И.О	Организация	Должность	Телефон	Подпись
1	Курбонова Мавлуда Исодиевна			94-613-33-35	
2	Хасанов Равшан Рахматович			99-034 05 39	
3	Розиков Кароматт				
4	Шарипова Акмал Дадиевна			93-686 0455	
5	Муродов Алишер				

6	Вахидов Комил Бобомуродович	кафедра		93-687 26-70	
7	Рахматов Бахро	кафедра		93-622-86 33	
8	Бахронова Нав-бахор Фахриддиновна	котиб ишлаш фаолиятини		93-704-06 91	
9	Аминов Махсуд	ў		93-969 34-55.	
10	Шукуров Улугбек			99-350-60 45.	
11	Ибрахимов Сухроб			99-777-47 30.	
12	Бахрова Мехрибон Собировна			93-622-03 56	
13					
14					

«Утверждаю»
Председатель МСГ Бобур
Рамитанского
района Бухарской области
_____
«17» августа 2024 г.

«17» августа 2024 года

ПРОТОКОЛ

Проведение махалинского схода граждан «Бобур» районного центра Рамитан по подготовке к реализации проекта «Развитие и модернизация систем водоснабжения и канализации Бухарской области (Фаза-1, Компонент -2: Канализация)»

р/ц Рамитан

Председатель собрания: Бурхонотова М – Председатель МСГ «Бобур»

Присутствовали члены кенгаша МСГ «Бобур», активисты махали, представители местных органов власти, социальных учреждений и филиала ООО «Бухаро Сувтаминот».
Всего присутствовало 5 человек (Список прилагается).

Собрание МСГ проходило в МСГ Бобур

Сельский сход граждан МСГ «Бобур» проходил во исполнение и в соответствии с законодательством Республики Узбекистан: ЗАКОН РЕСПУБЛИКИ УЗБЕКИСТАН за №393 «САНИТАРНО-ЭПИДЕМИОЛОГИЧЕСКОМ БЛАГОПОЛУЧИИ НАСЕЛЕНИЯ» от 26.08.20215 года, ПОСТАНОВЛЕНИЕ ПРЕЗИДЕНТА РЕСПУБЛИКИ УЗБЕКИСТАН «О МЕРАХ ПО СОВЕРШЕНСТВОВАНИЮ ПОРЯДКА ВЫДЕЛЕНИЯ ЗЕМЕЛЬНЫХ УЧАСТКОВ ДЛЯ ИНЖЕНЕРНО-КОММУНИКАЦИОННЫХ СЕТЕЙ» ПП-204 от 12.04.2022 года, ПОСТАНОВЛЕНИК КАБИНЕТА МИНИСТРОВ РЕСПУБЛИКИ УЗБЕКИСТАН «ОБ УТВЕРЖДЕНИИ ПОЛОЖЕНИЯ ОБ ИНДИВИДУАЛЬНОМ ЖИЛИЩНОМ СТРОИТЕЛЬСТВЕ», ПОСТАНОВЛЕНИЕ КАБИНЕТА МИНИСТРОВ РЕСПУБЛИКИ УЗБЕКИСТАН «О ДАЛЬНЕЙШЕМ СОВЕРШЕНСТВОВАНИИ МЕХАНИЗМА ОЦЕНКИ ВОЗДЕЙСТВИЯ НА ОКРУЖАЮЩУЮ СРЕДУ» за №541 от 07.09.2020 года, ПОСТАНОВЛЕНИЕ КАБИНЕТА МИНИСТРОВ «О МЕРАХ ПО РЕАЛИЗАЦИИ ПРОЕКТА «РАЗВИТИЕ И МОДЕРНИЗАЦИЯ СИСТЕМ ВОДОСНАБЖЕНИЯ И КАНАЛИЗАЦИИ БУХАРСКОЙ ОБЛАСТИ» С УЧАСТИЕМ АЗИАТСКОГО БАНКА ИНФРАСТРУКТУРНЫХ ИНВЕСТИЦИЙ» ПКМ-482 от 12.08.2023 года.

Представитель Санитарно-эпидемиологического службы Рамитанского района проинформировал участников, что текущая санитарно-эпидемиологическая обстановка и неадекватная существующая санитарная инфраструктура являются одними из основных причин заболеваний населения инфекционными и паразитарными заболеваниями. Смертность от инфекционных и паразитарных заболеваний занимает второе место после заболеваний сердечно-сосудистой системы. От инфекционных и паразитарных

заболеваний особенно страдают дети и женщины. Представитель Сан-эпид. надзора напомнила присутствующим, что в соответствии с Законом РУ «О санитарно-эпидемиологическом благополучии населения» органы самоуправления граждан должны «Осуществлять общественный контроль на соответствующей территории за реализацией мероприятий в области санитарно-эпидемиологического благополучия населения, соблюдением правил застройки и содержания дворовых и придомовых территорий (статья 14). А граждане обязаны соблюдать требования законодательства о санитарно-эпидемиологическом благополучии населения и не допускать действий, влекущих за собой нарушения прав других граждан на охрану здоровья и благоприятную среду обитания (статья 17). Кроме того, текущая санитарная практика на уровне домохозяйств и водоотведение снижают качество жизни и уровень благоустройства индивидуального жилья.

Начальник районного отдела экологии и охраны окружающей среды, проинформировал присутствующих, что существующая практика санитарии и водоотведения ведет к загрязнению окружающей среды и грунтовых вод. В условиях роста дефицита воды загрязнение грунтовых и поверхностных вод создает опасность для жизнедеятельности населения и будущих поколений.

Представитель управления Благоустройства хокимиата Рамитанского района проинформировал участников схода о том, что в целях упорядочения индивидуального жилищного строительства Кабинет Министров РУ (ПКМ № 272 от 30 декабря 2006 г.) утвердил «Положение об индивидуальном жилищном строительстве», согласно которому «Самовольной постройкой считаются жилые дома, другие строения и сооружения или иное недвижимое имущество, построенные застройщиками на земельных участках, не отведенных для этих целей в порядке, установленном законодательством, а также возведенные без получения на это необходимого разрешения либо с существенным нарушением градостроительных норм и правил (статья 33 Положения).

Представитель районного управления архитектуры сообщил участникам схода, что в соответствии со статьями 34 и 35 «Положения об индивидуальном жилищном строительстве», утверждённого Постановлением Кабинет Министров № 272 от 30 декабря 2006 г. «В случае обнаружения самовольной постройки должностными лицами органов архитектуры и строительства районов (городов) составляется акт о факте самовольной постройки. Одновременно с составлением акта должностными лицами органов архитектуры и строительства районов (городов) выдается предписание о приостановлении самовольной постройки. Копия предписания представляется в хокимият района (города) для дальнейшего решения вопроса по самовольно возведенному строению в установленном порядке.». Архитектор обратил внимание присутствующих на тот факт, что в районном центре Рамитан многие домохозяйства вынесли свои септики за территорию своего придомового участка. Большинство из них устроены вдоль дорог и находятся на территории, которая находится в ведении Управления благоустройства.

Представитель районного кадастра сказал присутствующим, что на территории города имеется много строений, построенных населением на участках, которые им не принадлежат, и большая часть этих строений не имеет каких-либо кадастровых документов. Согласно законодательству Узбекистана, предусмотрено, что перемещение и снос таких сооружений должен осуществляться за счет собственника недвижимости.

Председатель МСГ проинформировал участников сельского схода об инициативах Правительства Узбекистана о разработке долгосрочной программы по увеличению предоставления качественных услуг водоснабжения и канализации населению, укреплению институциональной базы и физической инфраструктуры действующих эксплуатирующих организаций, улучшению санитарно-экологической обстановки в регионах Республики. В целях реализации данной программы Правительство РУ получила финансирование от Азиатского банка инфраструктурных инвестиций (АБИИ) на модернизацию систем водоснабжения и канализации для повышения уровня жизни и благосостояния населения Бухарской области. В частности, районный центр Рамитан, был включен в проект «Развитие и модернизация систем канализации в районных центрах Гиждуван, Рамитан, Каракуль, Алат и Караулбазар (I приоритет)».

Директор филиала АО «Бухаро Сувтаминот» Рамитанского района проинформировал присутствующих что в Рамитане предусматривается строительство канализационных сетей, канализационных насосных станций и станции по очистке сточных вод. Протяжённость канализационных сетей будет составлять 102 км. Планируется 100% подключение домохозяйств к будущей централизованной канализации. Домохозяйства будут подключаться к централизованной канализации через колодцы. В один колодец будут подключены по несколько домохозяйств. Домохозяйства должны самостоятельно подключаться к центральной канализации по мере ее строительства. Далее директор сообщил, что большая часть канализационных труб планируется уложить вдоль дорог. А так как в городе многие улицы узкие, то некоторые частные септики будут мешать ходу строительства. Чьи именно септики в будущем помешают строительству, в настоящее время, сказать сложно. Поэтому все домохозяйства, чьи септики находятся за пределами границ домохозяйства, должны быть готовы отключить систему водоотведения своего домохозяйства от своих септиков или демонтировать их и перенести на время строительства на территорию своего домохозяйства.

Председатель МСГ, обращаясь к присутствующим сказал, что до поры до времени, все «закрывали глаза» на то, что частные септики находятся на общественной территории (за пределами границ участков домохозяйств), и что эти домохозяйства нарушают законодательство. Однако пришло время навести порядок в вопросе места устройства частных септиков. Правительство Узбекистана позаботилось о жителях нашего районного центра. Поэтому мы не должны чинить препятствий строительству централизованной канализации в нашем городе. Все домохозяйства, чьи септики находятся за пределами территории своего домовладения, должны устроить септики на территории своего придомового участка. И перенос септиков эти домохозяйства должны выполнить за свой счет.

Директор филиала АО «Бухаро Сувтаминот» Рамитанского района пояснил, что перенос септиков с общественной территории на участок собственного домовладения будет временной мерой. Как только канализационная сеть будет построена, они должны будут подключиться к построенным колодцам централизованной канализации. Поэтому процесс переноса септиков на территорию домохозяйства можно осуществить накануне строительных работ, когда уже точно будет известно, чьи септики попадают в зону прокладки траншеи.

Выступление с мест участников схода граждан.

1. Этот проект очень необходим и выгоден для нас. И нам повезло, что наш город был включен в проект. Поэтому мы поддерживаем реализацию этого проекта. Мы

все хотим, чтобы уровень и качество жизни жителей махаллей улучшились. Мы понимаем, что многие наши септики незаконно находятся за пределами территории индивидуального частного домовладения. Поэтому мы согласны на перенос незаконно построенных сооружений на свои придомовые участки за свой счет.

2. Мой септик находится прямо вдоль дороги. У меня небольшой двор и огород. Можно я уберу свой септик, когда начнутся строительные работы на нашей улице. Пока будут идти строительные работы, я сделаю или куплю емкость, куда временно будут собираться все стоки с моего домохозяйства. Я тоже поддерживаю проект.
3. Сегодня на сходе граждан присутствуют не все жители нашей махали. Поэтому те, кто присутствуют здесь сегодня, должны донести информацию отсутствующим. Самое главное, они должны понять, что если их септик будет мешать строительным работам, то он должен за свой счет временно перенести септик на территории своего домохозяйства. А когда будет построена сеть и колодцы, они должны будут подключиться к централизованной канализации.
4. На каждой улице необходимо выбрать активистов, которые будут помогать Махаллинскому комитету в процессе переноса септиков, которые будут мешать строительным работам, на территорию частных домовладений.
5. Необходимо собрать заявления от каждого владельца домохозяйства, чьи септики находятся за пределами частного домовладения, что они сами за свой счет перенесут септики на территорию своего домовладения до начала строительных работ.

По итогам выступлений на махаллинском сходе граждан было составлено Постановление, которое было зачитано присутствующим.

ПОСТАНОВЛЕНИЕ:

1. Участники схода поддерживают проект по строительству централизованной канализации в городе Рамитан в Бухарской области. Участники осведомлены, что будут построены канализационные сети, КНС и Канализационные очистные сооружения.
2. Участники понимают необходимость переноса своих септиков, находящиеся на общественной территории, на территорию своего домовладения.
3. Домохозяйства, чьи септики находятся за пределами частного домовладения, должны написать заявление о том, что они перенесут свои септики за счет собственных средств.
4. Ответственность за сбор заявлений от домохозяйств возлагается на Махаллинский комитет. В целях оптимизации документооборота заявления от домохозяйств лучше сделать в табличной форме.
5. Когда будет построена централизованная канализация, все домохозяйства махалли должны подключиться к ней.
6. Данный протокол вывесить в здании Махаллинского комитета для всеобщего информирования.
7. Список участков данного махаллинского схода и Заявления от домохозяйств о переносе своих септиков за свой счет до начала строительных работу, являются неотъемлемой частью Протокола.

Итоги голосования за Постановление схода граждан махали“ Бббур **”**

За 3
Против 4
Воздержавшиеся _____

Секретарь собрания ФИО Олимов Ф.

Председатель собрания ФИО Н. Гуломмотова

***Протокол составить и подписать в 2 экз.** для: МСГ, хокимиат, ООО «Бухаро сувтаминот», районного филиала ООО «Бухаро Сувтаминот», ГКП, Nicholas O'Dwyer Ltd.*

Список участников

Общественнй консультации по проекту Проекта «Развитие и модернизация систем водоснабжения и канализации Бухарской области (Фаза-1, Компонент-2: Канализация)» районного центра Рамитан

Дата: 17 августа

Место проведения: МСТ „Бобур"

№	Ф.И.О	Организация	Должность	Телефон	Подпись
1	Атаджанова Нигобат.		Учёная	99-380-32-42.	
2	Аллаева Гюльнара		Учёная	95-552-79-81.	
3	Бекбудов Сайдулло		Жаранкаҳўр	93-478-25-93.	
4	Ражапова Ялқунчи		9 мактаб ўқитувчи	99-113-44-77.	
5	Бакирова Навжуда		Бобурмой ходимаси	99-409-90-20	

"Approve"
Chairman of *Zarafshon* MCG of the Ramitan district in Bukhara region
Tursunova Mukhayo
August 17, 2024

August 17, 2024

MINUTES OF MEETING

Holding a *Zarafshan* mahalla citizens' gathering in Ramitan district centre for the preparing the implementation of the Project "Development and modernization of water supply and sewerage systems in Bukhara region (Phase-1, Component -2: Sewerage)"

Ramitan district centre

Chairman of the Meeting: *Tursunova M.* – Chairman of *Zarafshan* MCG

Attendees: *Zarafshan* mahalla members, mahalla activists, representatives of local authorities, social services and Bukhara Suv Taminot JSC.

Total attendees (list is attached).

MCG Meeting was held at the *building of Zarafshan MCG*

Rural citizens' gathering of *Zarafshan* MCG was held in the execution and according to LAW No. 393 OF THE REPUBLIC UZBEKISTAN "SANITARY AND EPIDEMIOLOGICAL WELFARE OF THE POPULATION" dated 26.08.2015, RESOLUTION OF THE PRESIDENT OF THE REPUBLIC OF UZBEKISTAN "ON MEASURES TO IMPROVEMENT OF THE PROCEDURE FOR ALLOCATING LAND PLOTS FOR ENGINEERING AND COMMUNICATION NETWORKS" PP-204 dated 12.04.2022, RESOLUTION OF THE CABINET OF MINISTERS OF THE REPUBLIC OF UZBEKISTAN "ON APPROVAL OF THE REGULATIONS ON INDIVIDUAL HOUSING CONSTRUCTION", RESOLUTION OF THE CABINET OF MINISTERS OF THE REPUBLIC OF UZBEKISTAN "ON FURTHER IMPROVEMENT OF THE ENVIRONMENTAL IMPACT ASSESSMENT MECHANISM" No.541 dated 07.09.2020, RESOLUTION OF THE CABINET OF MINISTERS "ON MEASURES TO IMPLEMENT THE PROJECT "DEVELOPMENT AND MODERNIZATION OF WATER SUPPLY AND SEWERAGE SYSTEMS OF THE BUKHARA REGION" WITH THE PARTICIPATION OF THE ASIAN INFRASTRUCTURE INVESTMENT BANK" PKM-482 dated 12.08.2023.

A representative of the Sanitary and Epidemiological Services (SES) of the Ramitan district informed the participants that the current sanitary and epidemiological situation and inadequate existing sanitary infrastructure are among the main causes of infectious and parasitic diseases among the population. Mortality from infectious and parasitic diseases ranks second after diseases of the cardiovascular system. Infectious and parasitic diseases especially affect children and women. Representative of SES reminded those present that in accordance with the Law of the Republic of Uzbekistan "On the Sanitary and Epidemiological Well-being of the Population", citizens' self-government bodies shall "Exercise public control in the relevant territory over the implementation of measures in the field of sanitary and epidemiological well-being of the population, compliance with the rules of development and maintenance of yards and adjacent territories (Art. 14). And citizens are obliged to comply with the requirements of the legislation on the sanitary and epidemiological well-being of the population and to

prevent actions that entail violations of the rights of other citizens to health care and a favourable living environment (Art. 17). In addition, current household sanitation and wastewater disposal practices reduce the quality of life and the level of improvement of individual housing.

The head of the district department of ecology and environmental protection, informed those present that the existing practice of sanitation and wastewater disposal leads to pollution of the environment and groundwater. In the context of growing water scarcity, the pollution of groundwater and surface water poses a threat to the livelihoods of the population and future generations.

A representative of the Department of Land Improvement of the Ramitan district of Hokimiyat informed the meeting participants that in order to streamline individual housing construction, the Cabinet of Ministers of the Republic of Uzbekistan (PCM No. 272 dd December 30, 2006) approved the "Regulation on Individual Housing Construction", according to which "Unauthorized construction is considered to be residential buildings, other structures and objects or other real estate built by developers on land plots, not allocated for these purposes in accordance with the procedure established by law, as well as erected without obtaining the necessary permission or with a significant violation of town-planning norms and rules (Article 33 of the Regulations).

A representative of the District Department of Architecture informed the meeting participants that in accordance with Articles 34 and 35 of the "Regulations on Individual Housing Construction", approved by the Resolution of the Cabinet of Ministers No. 272 of December 30, 2006, "In case of detection of unauthorized construction, officials of the architectural and construction bodies of districts (cities) draw up an act on the fact of unauthorized construction. Simultaneously with the drawing up of the act, officials of the bodies of architecture and construction of districts (cities) issue an order to suspend unauthorized construction. A copy of the prescription shall be submitted to the hokimiyat of the district (city) for further resolution of the issue of the unauthorized construction in accordance with the established procedure. The architect drew the attention of those present to the fact that in the Ramitan district center many households moved their septic tanks outside the territory of their house plot. Most of them are arranged along the roads and are located in the territory that is managed by the Improvement Department.

A representative of the district cadastre told those present that there are many buildings in the city built by the population on plots that do not belong to them, and most of these buildings do not have any cadastral documents. According to the legislation of Uzbekistan, it is stipulated that the relocation and demolition of such structures must be carried out at the expense of the owner of the property.

The Mahalla committee chairman informed the meeting participants on the initiatives of the Government of Uzbekistan on the development of a long-term program to increase the provision of quality water supply and sanitation services to the population, strengthen the institutional base and physical infrastructure of existing operating organizations, and improve the sanitary and environmental situation in the regions of the Republic. In order to implement this program, the Government of the Republic of Uzbekistan received financing from the Asian Infrastructure Investment Bank (AIIB) for the modernization of water supply and sewerage systems to improve the living standards and well-being of the population of the Bukhara region. In particular, the Ramitan district centre was included in the Project "Development and modernization of sewerage systems in the district centres of Gijduvan, Ramitan, Karakul, Alat and Karaulbazar (I priority)".

The director of the Ramitan district branch of Bukhoro Suvtaminoti JSC informed those present that the Ramitan provides for the construction of sewage networks, sewage pumping stations and a wastewater treatment plant. The length of the sewerage networks will be 102 km. It is planned to connect 100% of households to the future centralized sewerage system. Households will be connected to the centralized sewerage system through manholes. Several households will be connected to one manhole. Households shall connect to the central sewerage system on their own as it is built. Further, the director said that most of the sewer pipes are planned to be laid along the roads. And since in the town many streets are narrow, then some private septic tanks will interfere with the progress of construction. It is difficult to say whose septic tanks will interfere with construction in the future. Therefore, all households whose septic tanks are located outside the household boundaries should be prepared to disconnect their household's sewerage system from their septic tanks or dismantle them and move them to their household property during construction.

The Mahalla Chairman addressing the audience said that for the time being, everyone "turned a blind eye" to the fact that private septic tanks were located on public property (outside the boundaries of household plots), and that these households violated the law. However, the time has come to make things clear in order in the issue of the location of private septic tanks. The Government of Uzbekistan has taken care of the residents of our district center. Therefore, we should not put obstacles in the way of the construction of a centralized sewerage in our city. All households whose septic tanks are located outside the territory of their household must install septic tanks on the territory of their house plot. And these households must carry out the transfer of septic tanks at their own expense.

The director of the branch of Bukharo Suvtaminot JSC of Ramitan district center explained that the transfer of septic tanks from the public area to the site of their own household will be a temporary measure. Once the sewer network is built, they will have to connect to the constructed centralized sewerage manholes. Therefore, the process of transferring septic tanks to the territory of the household can be carried out on the eve of construction work, when it will already be known exactly whose septic tanks fall to the trench area.

Remarks from the participants sitting on their seats.

1. This project is very necessary and profitable for us. And we were lucky that our city was included in the project. Therefore, we support the implementation of this project. We all want the level and quality of life of mahalla residents to improve. We understand that many of our septic tanks are illegally located outside the territory of individual private households. Therefore, we agree to relocate illegally built structures to our house plots at our own expense.

2. My septic tank is right along the road. I have a small yard and a vegetable garden. Can I remove my septic tank when the construction work on our street begins. While the construction work is going on, I will make or buy a container where all the sewage from my household will be temporarily collected. I also support the project.

3. Today, not all residents of our mahalla are present at the citizens' meeting. Therefore, it is up to those who are here today to disseminate information to those who are missing. Most importantly, they need to understand that if their septic tank interferes with construction work, they must temporarily relocate the septic tank to their household at their own expense. And when the network and manholes are built, they will have to be connected to the centralized sewerage system.

4. On each street, it is necessary to select activists who will help the Mahalla Committee in the process of relocating septic tanks that will interfere with construction work to the territory of private households.

5. It is necessary to collect statements from each household owner whose septic tanks are located outside the private household that they themselves will relocate the septic tanks to the territory of their household at their own expense before the start of construction work.

Based on the results of the speeches at the mahalla gathering of citizens, a Decision was drawn up, which was read out to those present.

DECISION:

1. Participants of the meeting support the project for the construction of a centralized sewerage system in the Ramitan town in the Bukhara region. The participants are aware that sewerage networks, sewage pumping stations and wastewater treatment plants will be built.
2. Participants understand the need to move their septic tanks located on public property to the territory of their household.
3. Households whose septic tanks are located outside the private household must write a statement that they will move their septic tanks at their own expense.
4. The Mahalla Committee is responsible for collecting statements from households. In order to optimize the flow of documents, it is better to make householder statements in tabular form.
5. When the centralized sewerage system is built, all households of the mahalla shall be connected to it.
6. This protocol shall be posted in the building of the Mahalla Committee for public information.
7. The list of this mahalla meeting participants and statements from households for the relocation of their septic tanks at their own expense before the start of construction work is an integral part of these Minutes.

Results of voting for the Decision of Mahalla Citizens' meeting _____"

For _____ Against _____ Abstained _____

Secretary NAME _____

Presided by NAME *Tursunova (signed)*

**** The minutes shall be drawn up and signed in 2 copies.*** *for: mahalla, hokimiyat, Bukhoro suv taminoti JSC, district branch of Bukhoro Suv taminoti JSC, PCU, Nicholas O'Dwyer Ltd.*

"Approve"
Chairman of *Navoiy* MCG of the Ramitan
district in Bukhara region
Fayziev Tolmas
August 17, 2024

August 17, 2024

MINUTES OF MEETING

Holding a *Navoiy* mahalla citizens' gathering in Ramitan district centre for the preparing the implementation of the Project "Development and modernization of water supply and sewerage systems in Bukhara region (Phase-1, Component -2: Sewerage)"

Ramitan district centre

Chairman of the Meeting: *Fayziev T.* – Chairman of *A. Navoiy* MCG

Attendees: *A. Navoiy* mahalla members, mahalla activists, representatives of local authorities, social services and Bukhara Suv Taminot JSC.

Total *11* attendees (list is attached).

MCG Meeting was held at the *A. Navoiy MCG*

Rural citizens' gathering of *A. Navoiy* MCG was held in the execution and according to LAW No. 393 OF THE REPUBLIC UZBEKISTAN "SANITARY AND EPIDEMIOLOGICAL WELFARE OF THE POPULATION" dated 26.08.2015, RESOLUTION OF THE PRESIDENT OF THE REPUBLIC OF UZBEKISTAN "ON MEASURES TO IMPROVEMENT OF THE PROCEDURE FOR ALLOCATING LAND PLOTS FOR ENGINEERING AND COMMUNICATION NETWORKS" PP-204 dated 12.04.2022, RESOLUTION OF THE CABINET OF MINISTERS OF THE REPUBLIC OF UZBEKISTAN "ON APPROVAL OF THE REGULATIONS ON INDIVIDUAL HOUSING CONSTRUCTION", RESOLUTION OF THE CABINET OF MINISTERS OF THE REPUBLIC OF UZBEKISTAN "ON FURTHER IMPROVEMENT OF THE ENVIRONMENTAL IMPACT ASSESSMENT MECHANISM" No.541 dated 07.09.2020, RESOLUTION OF THE CABINET OF MINISTERS "ON MEASURES TO IMPLEMENT THE PROJECT "DEVELOPMENT AND MODERNIZATION OF WATER SUPPLY AND SEWERAGE SYSTEMS OF THE BUKHARA REGION" WITH THE PARTICIPATION OF THE ASIAN INFRASTRUCTURE INVESTMENT BANK" PKM-482 dated 12.08.2023.

A representative of the Sanitary and Epidemiological Services (SES) of the Ramitan district informed the participants that the current sanitary and epidemiological situation and inadequate existing sanitary infrastructure are among the main causes of infectious and parasitic diseases among the population. Mortality from infectious and parasitic diseases ranks second after diseases of the cardiovascular system. Infectious and parasitic diseases especially affect children and women. Representative of SES reminded those present that in accordance with the Law of the Republic of Uzbekistan "On the Sanitary and Epidemiological Well-being of the Population", citizens' self-government bodies shall "Exercise public control in the relevant territory over the implementation of measures in the field of sanitary and epidemiological well-being of the population, compliance with the rules of development and maintenance of yards and adjacent territories (Art. 14). And citizens are obliged to comply with the requirements of the legislation on the sanitary and epidemiological well-being of the population and to

prevent actions that entail violations of the rights of other citizens to health care and a favourable living environment (Art. 17). In addition, current household sanitation and wastewater disposal practices reduce the quality of life and the level of improvement of individual housing.

The head of the district department of ecology and environmental protection, informed those present that the existing practice of sanitation and wastewater disposal leads to pollution of the environment and groundwater. In the context of growing water scarcity, the pollution of groundwater and surface water poses a threat to the livelihoods of the population and future generations.

A representative of the Department of Land Improvement of the Ramitan district of Hokimiyat informed the meeting participants that in order to streamline individual housing construction, the Cabinet of Ministers of the Republic of Uzbekistan (PCM No. 272 dd December 30, 2006) approved the "Regulation on Individual Housing Construction", according to which "Unauthorized construction is considered to be residential buildings, other structures and objects or other real estate built by developers on land plots, not allocated for these purposes in accordance with the procedure established by law, as well as erected without obtaining the necessary permission or with a significant violation of town-planning norms and rules (Article 33 of the Regulations).

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A representative of the district cadastre told those present that there are many buildings in the city built by the population on plots that do not belong to them, and most of these buildings do not have any cadastral documents. According to the legislation of Uzbekistan, it is stipulated that the relocation and demolition of such structures must be carried out at the expense of the owner of the property.

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The director of the branch of Bukharo Suvtaminot JSC of Ramitan district center explained that the transfer of septic tanks from the public area to the site of their own household will be a temporary measure. Once the sewer network is built, they will have to connect to the constructed centralized sewerage manholes. Therefore, the process of transferring septic tanks to the territory of the household can be carried out on the eve of construction work, when it will already be known exactly whose septic tanks fall to the trench area.

Remarks from the participants sitting on their seats.

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3. Today, not all residents of our mahalla are present at the citizens' meeting. Therefore, it is up to those who are here today to disseminate information to those who are missing. Most importantly, they need to understand that if their septic tank interferes with construction work, they must temporarily relocate the septic tank to their household at their own expense. And when the network and manholes are built, they will have to be connected to the centralized sewerage system.

4. On each street, it is necessary to select activists who will help the Mahalla Committee in the process of relocating septic tanks that will interfere with construction work to the territory of private households.

5. It is necessary to collect statements from each household owner whose septic tanks are located outside the private household that they themselves will relocate the septic tanks to the territory of their household at their own expense before the start of construction work.

Based on the results of the speeches at the mahalla gathering of citizens, a Decision was drawn up, which was read out to those present.

DECISION:

1. Participants of the meeting support the project for the construction of a centralized sewerage system in the Ramitan town in the Bukhara region. The participants are aware that sewerage networks, sewage pumping stations and wastewater treatment plants will be built.
2. Participants understand the need to move their septic tanks located on public property to the territory of their household.
3. Households whose septic tanks are located outside the private household must write a statement that they will move their septic tanks at their own expense.
4. The Mahalla Committee is responsible for collecting statements from households. In order to optimize the flow of documents, it is better to make householder statements in tabular form.
5. When the centralized sewerage system is built, all households of the mahalla shall be connected to it.
6. This protocol shall be posted in the building of the Mahalla Committee for public information.
7. The list of this mahalla meeting participants and statements from households for the relocation of their septic tanks at their own expense before the start of construction work is an integral part of these Minutes.

Results of voting for the Decision of Mahalla Citizens' meeting _____"

For **11**

Against **-**

Abstained **-**

Secretary	NAME	*Olimov F. (signed)*
Presided by	NAME	*Fayziev (signed)*

**** The minutes shall be drawn up and signed in 2 copies.*** *for: mahalla, hokimiyat, Bukhoro suv taminoti JSC, district branch of Bukhoro Suv taminoti JSC, PCU, Nicholas O'Dwyer Ltd.*

"Approve"
Chairman of *Tarnaut* MCG of the Ramitan district in Bukhara region
Azimov Kamil
August 16, 2024

August 16, 2024

MINUTES OF MEETING

Holding an *Tarnaut* mahalla citizens' gathering in Ramitan district centre for the preparing the implementation of the Project "Development and modernization of water supply and sewerage systems in Bukhara region (Phase-1, Component -2: Sewerage)"

Ramitan district centre

Chairman of the Meeting: *Azimov K.* – Chairman of *Tarnaut* MCG

Attendees: *A. Navoiy* mahalla members, mahalla activists, representatives of local authorities, social services and Bukhara Suv Taminot JSC.

Total *12* attendees (list is attached).

MCG Meeting was held at the building of *Tarnaut MCG*

Rural citizens' gathering of *Tarnaut* MCG was held in the execution and according to LAW No. 393 OF THE REPUBLIC UZBEKISTAN "SANITARY AND EPIDEMIOLOGICAL WELFARE OF THE POPULATION" dated 26.08.2015, RESOLUTION OF THE PRESIDENT OF THE REPUBLIC OF UZBEKISTAN "ON MEASURES TO IMPROVEMENT OF THE PROCEDURE FOR ALLOCATING LAND PLOTS FOR ENGINEERING AND COMMUNICATION NETWORKS" PP-204 dated 12.04.2022, RESOLUTION OF THE CABINET OF MINISTERS OF THE REPUBLIC OF UZBEKISTAN "ON APPROVAL OF THE REGULATIONS ON INDIVIDUAL HOUSING CONSTRUCTION", RESOLUTION OF THE CABINET OF MINISTERS OF THE REPUBLIC OF UZBEKISTAN "ON FURTHER IMPROVEMENT OF THE ENVIRONMENTAL IMPACT ASSESSMENT MECHANISM" No.541 dated 07.09.2020, RESOLUTION OF THE CABINET OF MINISTERS "ON MEASURES TO IMPLEMENT THE PROJECT "DEVELOPMENT AND MODERNIZATION OF WATER SUPPLY AND SEWERAGE SYSTEMS OF THE BUKHARA REGION" WITH THE PARTICIPATION OF THE ASIAN INFRASTRUCTURE INVESTMENT BANK" PKM-482 dated 12.08.2023.

A representative of the Sanitary and Epidemiological Services (SES) of the Ramitan district informed the participants that the current sanitary and epidemiological situation and inadequate existing sanitary infrastructure are among the main causes of infectious and parasitic diseases among the population. Mortality from infectious and parasitic diseases ranks second after diseases of the cardiovascular system. Infectious and parasitic diseases especially affect children and women. Representative of SES reminded those present that in accordance with the Law of the Republic of Uzbekistan "On the Sanitary and Epidemiological Well-being of the Population", citizens' self-government bodies shall "Exercise public control in the relevant territory over the implementation of measures in the field of sanitary and epidemiological well-being of the population, compliance with the rules of development and maintenance of yards and adjacent territories (Art. 14). And citizens are obliged to comply with the requirements of the legislation on the sanitary and epidemiological well-being of the population and to prevent actions that entail violations of the rights of other citizens to health care and a

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A representative of the district cadastre told those present that there are many buildings in the city built by the population on plots that do not belong to them, and most of these buildings do not have any cadastral documents. According to the legislation of Uzbekistan, it is stipulated that the relocation and demolition of such structures must be carried out at the expense of the owner of the property.

The Mahalla committee chairman informed the meeting participants on the initiatives of the Government of Uzbekistan on the development of a long-term program to increase the provision of quality water supply and sanitation services to the population, strengthen the institutional base and physical infrastructure of existing operating organizations, and improve the sanitary and environmental situation in the regions of the Republic. In order to implement this program, the Government of the Republic of Uzbekistan received financing from the Asian Infrastructure Investment Bank (AIIB) for the modernization of water supply and sewerage systems to improve the living standards and well-being of the population of the Bukhara region. In particular, the Ramitan district centre was included in the Project "Development and modernization of sewerage systems in the district centres of Gijduvan, Ramitan, Karakul, Alat and Karaulbazar (I priority)".

The director of the Ramitan district branch of Bukhoro Suvtaminoti JSC informed those present that the Ramitan provides for the construction of sewage networks, sewage pumping stations and a wastewater treatment plant. The length of the sewerage networks will be 102 km. It is planned to connect 100% of households to the future centralized sewerage system. Households will be connected to the centralized sewerage system through manholes. Several households will be connected to one manhole. Households shall connect to the central sewerage system on their own as it is built. Further, the director said that most of the sewer pipes are planned to be laid along the roads. And since in the town many streets are narrow, then some private septic tanks will interfere with the progress of construction. It is difficult to say whose septic tanks will interfere with construction in the future. Therefore, all households whose septic tanks are located outside the household boundaries should be prepared to disconnect their household's sewerage system from their septic tanks or dismantle them and move them to their household property during construction.

The Mahalla Chairman addressing the audience said that for the time being, everyone "turned a blind eye" to the fact that private septic tanks were located on public property (outside the boundaries of household plots), and that these households violated the law. However, the time has come to make things clear in order in the issue of the location of private septic tanks. The Government of Uzbekistan has taken care of the residents of our district center. Therefore, we should not put obstacles in the way of the construction of a centralized sewerage in our city. All households whose septic tanks are located outside the territory of their household must install septic tanks on the territory of their house plot. And these households must carry out the transfer of septic tanks at their own expense.

The director of the branch of Bukharo Suvtaminot JSC of Ramitan district center explained that the transfer of septic tanks from the public area to the site of their own household will be a temporary measure. Once the sewer network is built, they will have to connect to the constructed centralized sewerage manholes. Therefore, the process of transferring septic tanks to the territory of the household can be carried out on the eve of construction work, when it will already be known exactly whose septic tanks fall to the trench area.

Remarks from the participants sitting on their seats.

1. This project is very necessary and profitable for us. And we were lucky that our city was included in the project. Therefore, we support the implementation of this project. We all want the level and quality of life of mahalla residents to improve. We understand that many of our septic tanks are illegally located outside the territory of individual private households. Therefore, we agree to relocate illegally built structures to our house plots at our own expense.

2. My septic tank is right along the road. I have a small yard and a vegetable garden. Can I remove my septic tank when the construction work on our street begins. While the construction work is going on, I will make or buy a container where all the sewage from my household will be temporarily collected. I also support the project.

3. Today, not all residents of our mahalla are present at the citizens' meeting. Therefore, it is up to those who are here today to disseminate information to those who are missing. Most importantly, they need to understand that if their septic tank interferes with construction work, they must temporarily relocate the septic tank to their household at their own expense. And when the network and manholes are built, they will have to be connected to the centralized sewerage system.

4. On each street, it is necessary to select activists who will help the Mahalla Committee in the process of relocating septic tanks that will interfere with construction work to the territory of private households.

5. It is necessary to collect statements from each household owner whose septic tanks are located outside the private household that they themselves will relocate the septic tanks to the territory of their household at their own expense before the start of construction work.

Based on the results of the speeches at the mahalla gathering of citizens, a Decision was drawn up, which was read out to those present.

DECISION:

1. Participants of the meeting support the project for the construction of a centralized sewerage system in the Ramitan town in the Bukhara region. The participants are aware that sewerage networks, sewage pumping stations and wastewater treatment plants will be built.
2. Participants understand the need to move their septic tanks located on public property to the territory of their household.
3. Households whose septic tanks are located outside the private household must write a statement that they will move their septic tanks at their own expense.
4. The Mahalla Committee is responsible for collecting statements from households. In order to optimize the flow of documents, it is better to make householder statements in tabular form.
5. When the centralized sewerage system is built, all households of the mahalla shall be connected to it.
6. This protocol shall be posted in the building of the Mahalla Committee for public information.
7. The list of this mahalla meeting participants and statements from households for the relocation of their septic tanks at their own expense before the start of construction work is an integral part of these Minutes.

Results of voting for the Decision of Mahalla Citizens' meeting *"Tarnaut"*

For ***12***

Against ***0***

Abstained ***0***

Secretary	NAME	*F. Olimov (signed)*
Presided by	NAME	*K. Azimov (signed)*

**** The minutes shall be drawn up and signed in 2 copies.*** *for: mahalla, hokimiyat, Bukhoro suv taminoti JSC, district branch of Bukhoro Suv taminoti JSC, PCU, Nicholas O'Dwyer Ltd.*

"Approve"
Chairman of *Guliston* MCG of the Ramitan district in Bukhara region
Hamraeva Mexriniso
August 16, 2024

August 16, 2024

MINUTES OF MEETING

Holding a *Gulistan* mahalla citizens' gathering in Ramitan district centre for the preparing the implementation of the Project "Development and modernization of water supply and sewerage systems in Bukhara region (Phase-1, Component -2: Sewerage)"

Ramitan district centre

Chairman of the Meeting: *Hamraeva M.* – Chairman of *Gulistan* MCG

Attendees: *Gulistan* mahalla members, mahalla activists, representatives of local authorities, social services and Bukhara Suv Taminot JSC.

Total *12* attendees (list is attached).

MCG Meeting was held at the building of *Gulistan MCG*

Rural citizens' gathering of *Gulistan* MCG was held in the execution and according to LAW No. 393 OF THE REPUBLIC UZBEKISTAN "SANITARY AND EPIDEMIOLOGICAL WELFARE OF THE POPULATION" dated 26.08.2015, RESOLUTION OF THE PRESIDENT OF THE REPUBLIC OF UZBEKISTAN "ON MEASURES TO IMPROVEMENT OF THE PROCEDURE FOR ALLOCATING LAND PLOTS FOR ENGINEERING AND COMMUNICATION NETWORKS" PP-204 dated 12.04.2022, RESOLUTION OF THE CABINET OF MINISTERS OF THE REPUBLIC OF UZBEKISTAN "ON APPROVAL OF THE REGULATIONS ON INDIVIDUAL HOUSING CONSTRUCTION", RESOLUTION OF THE CABINET OF MINISTERS OF THE REPUBLIC OF UZBEKISTAN "ON FURTHER IMPROVEMENT OF THE ENVIRONMENTAL IMPACT ASSESSMENT MECHANISM" No.541 dated 07.09.2020, RESOLUTION OF THE CABINET OF MINISTERS "ON MEASURES TO IMPLEMENT THE PROJECT "DEVELOPMENT AND MODERNIZATION OF WATER SUPPLY AND SEWERAGE SYSTEMS OF THE BUKHARA REGION" WITH THE PARTICIPATION OF THE ASIAN INFRASTRUCTURE INVESTMENT BANK" PKM-482 dated 12.08.2023.

A representative of the Sanitary and Epidemiological Services (SES) of the Ramitan district informed the participants that the current sanitary and epidemiological situation and inadequate existing sanitary infrastructure are among the main causes of infectious and parasitic diseases among the population. Mortality from infectious and parasitic diseases ranks second after diseases of the cardiovascular system. Infectious and parasitic diseases especially affect children and women. Representative of SES reminded those present that in accordance with the Law of the Republic of Uzbekistan "On the Sanitary and Epidemiological Well-being of the Population", citizens' self-government bodies shall "Exercise public control in the relevant territory over the implementation of measures in the field of sanitary and epidemiological well-being of the population, compliance with the rules of development and maintenance of yards and adjacent territories (Art. 14). And citizens are obliged to comply with the requirements of the legislation on the sanitary and epidemiological well-being of the population and to prevent actions that entail violations of the rights of other citizens to health care and a

favourable living environment (Art. 17). In addition, current household sanitation and wastewater disposal practices reduce the quality of life and the level of improvement of individual housing.

The head of the district department of ecology and environmental protection, informed those present that the existing practice of sanitation and wastewater disposal leads to pollution of the environment and groundwater. In the context of growing water scarcity, the pollution of groundwater and surface water poses a threat to the livelihoods of the population and future generations.

A representative of the Department of Land Improvement of the Ramitan district of Hokimiyat informed the meeting participants that in order to streamline individual housing construction, the Cabinet of Ministers of the Republic of Uzbekistan (PCM No. 272 dd December 30, 2006) approved the "Regulation on Individual Housing Construction", according to which "Unauthorized construction is considered to be residential buildings, other structures and objects or other real estate built by developers on land plots, not allocated for these purposes in accordance with the procedure established by law, as well as erected without obtaining the necessary permission or with a significant violation of town-planning norms and rules (Article 33 of the Regulations).

A representative of the District Department of Architecture informed the meeting participants that in accordance with Articles 34 and 35 of the "Regulations on Individual Housing Construction", approved by the Resolution of the Cabinet of Ministers No. 272 of December 30, 2006, "In case of detection of unauthorized construction, officials of the architectural and construction bodies of districts (cities) draw up an act on the fact of unauthorized construction. Simultaneously with the drawing up of the act, officials of the bodies of architecture and construction of districts (cities) issue an order to suspend unauthorized construction. A copy of the prescription shall be submitted to the hokimiyat of the district (city) for further resolution of the issue of the unauthorized construction in accordance with the established procedure. The architect drew the attention of those present to the fact that in the Ramitan district center many households moved their septic tanks outside the territory of their house plot. Most of them are arranged along the roads and are located in the territory that is managed by the Improvement Department.

A representative of the district cadastre told those present that there are many buildings in the city built by the population on plots that do not belong to them, and most of these buildings do not have any cadastral documents. According to the legislation of Uzbekistan, it is stipulated that the relocation and demolition of such structures must be carried out at the expense of the owner of the property.

The Mahalla committee chairman informed the meeting participants on the initiatives of the Government of Uzbekistan on the development of a long-term program to increase the provision of quality water supply and sanitation services to the population, strengthen the institutional base and physical infrastructure of existing operating organizations, and improve the sanitary and environmental situation in the regions of the Republic. In order to implement this program, the Government of the Republic of Uzbekistan received financing from the Asian Infrastructure Investment Bank (AIIB) for the modernization of water supply and sewerage systems to improve the living standards and well-being of the population of the Bukhara region. In particular, the Ramitan district centre was included in the Project "Development and modernization of sewerage systems in the district centres of Gijduvan, Ramitan, Karakul, Alat and Karaulbazar (I priority)".

The director of the Ramitan district branch of Bukhoro Suvtaminoti JSC informed those present that the Ramitan provides for the construction of sewage networks, sewage pumping stations and a wastewater treatment plant. The length of the sewerage networks will be 102 km. It is planned to connect 100% of households to the future centralized sewerage system. Households will be connected to the centralized sewerage system through manholes. Several households will be connected to one manhole. Households shall connect to the central sewerage system on their own as it is built. Further, the director said that most of the sewer pipes are planned to be laid along the roads. And since in the town many streets are narrow, then some private septic tanks will interfere with the progress of construction. It is difficult to say whose septic tanks will interfere with construction in the future. Therefore, all households whose septic tanks are located outside the household boundaries should be prepared to disconnect their household's sewerage system from their septic tanks or dismantle them and move them to their household property during construction.

The Mahalla Chairman addressing the audience said that for the time being, everyone "turned a blind eye" to the fact that private septic tanks were located on public property (outside the boundaries of household plots), and that these households violated the law. However, the time has come to make things clear in order in the issue of the location of private septic tanks. The Government of Uzbekistan has taken care of the residents of our district center. Therefore, we should not put obstacles in the way of the construction of a centralized sewerage in our city. All households whose septic tanks are located outside the territory of their household must install septic tanks on the territory of their house plot. And these households must carry out the transfer of septic tanks at their own expense.

The director of the branch of Bukharo Suvtaminot JSC of Ramitan district center explained that the transfer of septic tanks from the public area to the site of their own household will be a temporary measure. Once the sewer network is built, they will have to connect to the constructed centralized sewerage manholes. Therefore, the process of transferring septic tanks to the territory of the household can be carried out on the eve of construction work, when it will already be known exactly whose septic tanks fall to the trench area.

Remarks from the participants sitting on their seats.

1. This project is very necessary and profitable for us. And we were lucky that our city was included in the project. Therefore, we support the implementation of this project. We all want the level and quality of life of mahalla residents to improve. We understand that many of our septic tanks are illegally located outside the territory of individual private households. Therefore, we agree to relocate illegally built structures to our house plots at our own expense.

2. My septic tank is right along the road. I have a small yard and a vegetable garden. Can I remove my septic tank when the construction work on our street begins. While the construction work is going on, I will make or buy a container where all the sewage from my household will be temporarily collected. I also support the project.

3. Today, not all residents of our mahalla are present at the citizens' meeting. Therefore, it is up to those who are here today to disseminate information to those who are missing. Most importantly, they need to understand that if their septic tank interferes with construction work, they must temporarily relocate the septic tank to their household at their own expense. And when the network and manholes are built, they will have to be connected to the centralized sewerage system.

4. On each street, it is necessary to select activists who will help the Mahalla Committee in the process of relocating septic tanks that will interfere with construction work to the territory of private households.

5. It is necessary to collect statements from each household owner whose septic tanks are located outside the private household that they themselves will relocate the septic tanks to the territory of their household at their own expense before the start of construction work.

Based on the results of the speeches at the mahalla gathering of citizens, a Decision was drawn up, which was read out to those present.

DECISION:

1. Participants of the meeting support the project for the construction of a centralized sewerage system in the Ramitan town in the Bukhara region. The participants are aware that sewerage networks, sewage pumping stations and wastewater treatment plants will be built.
2. Participants understand the need to move their septic tanks located on public property to the territory of their household.
3. Households whose septic tanks are located outside the private household must write a statement that they will move their septic tanks at their own expense.
4. The Mahalla Committee is responsible for collecting statements from households. In order to optimize the flow of documents, it is better to make householder statements in tabular form.
5. When the centralized sewerage system is built, all households of the mahalla shall be connected to it.
6. This protocol shall be posted in the building of the Mahalla Committee for public information.
7. The list of this mahalla meeting participants and statements from households for the relocation of their septic tanks at their own expense before the start of construction work is an integral part of these Minutes.

Results of voting for the Decision of Mahalla Citizens' meeting *"Gulistan"*

For ***12***

Against ***0***

Abstained ***0***

Secretary	NAME	*F. Olimov (signed)*
Presided by	NAME	*M. Hamraeva M. (signed)*

**** The minutes shall be drawn up and signed in 2 copies.*** *for: mahalla, hokimiyat, Bukhoro suv taminoti JSC, district branch of Bukhoro Suv taminoti JSC, PCU, Nicholas O'Dwyer Ltd.*

"Approve"
Chairman of *Bobur* MCG of the Ramitan
district in Bukhara region
Tuymurotova N.
August 17, 2024

August 17, 2024

MINUTES OF MEETING

Holding a *Bobul* mahalla citizens' gathering in Ramitan district centre for the preparing the implementation of the Project "Development and modernization of water supply and sewerage systems in Bukhara region (Phase-1, Component -2: Sewerage)"

Ramitan district centre

Chairman of the Meeting: *Tuymurotova N.* – Chairman of *Bobul* MCG

Attendees: *Bobul* mahalla members, mahalla activists, representatives of local authorities, social services and Bukhara Suv Taminot JSC.

Total 5 attendees (list is attached).

MCG Meeting was held at *Bobul MCG*

Rural citizens' gathering of *Bobul* MCG was held in the execution and according to LAW No. 393 OF THE REPUBLIC UZBEKISTAN "SANITARY AND EPIDEMIOLOGICAL WELFARE OF THE POPULATION" dated 26.08.2015, RESOLUTION OF THE PRESIDENT OF THE REPUBLIC OF UZBEKISTAN "ON MEASURES TO IMPROVEMENT OF THE PROCEDURE FOR ALLOCATING LAND PLOTS FOR ENGINEERING AND COMMUNICATION NETWORKS" PP-204 dated 12.04.2022, RESOLUTION OF THE CABINET OF MINISTERS OF THE REPUBLIC OF UZBEKISTAN "ON APPROVAL OF THE REGULATIONS ON INDIVIDUAL HOUSING CONSTRUCTION", RESOLUTION OF THE CABINET OF MINISTERS OF THE REPUBLIC OF UZBEKISTAN "ON FURTHER IMPROVEMENT OF THE ENVIRONMENTAL IMPACT ASSESSMENT MECHANISM" No.541 dated 07.09.2020, RESOLUTION OF THE CABINET OF MINISTERS "ON MEASURES TO IMPLEMENT THE PROJECT "DEVELOPMENT AND MODERNIZATION OF WATER SUPPLY AND SEWERAGE SYSTEMS OF THE BUKHARA REGION" WITH THE PARTICIPATION OF THE ASIAN INFRASTRUCTURE INVESTMENT BANK" PKM-482 dated 12.08.2023.

A representative of the Sanitary and Epidemiological Services (SES) of the Ramitan district informed the participants that the current sanitary and epidemiological situation and inadequate existing sanitary infrastructure are among the main causes of infectious and parasitic diseases among the population. Mortality from infectious and parasitic diseases ranks second after diseases of the cardiovascular system. Infectious and parasitic diseases especially affect children and women. Representative of SES reminded those present that in accordance with the Law of the Republic of Uzbekistan "On the Sanitary and Epidemiological Well-being of the Population", citizens' self-government bodies shall "Exercise public control in the relevant territory over the implementation of measures in the field of sanitary and epidemiological well-being of the population, compliance with the rules of development and maintenance of yards and adjacent territories (Art. 14). And citizens are obliged to comply with the requirements of the legislation on the sanitary and epidemiological well-being of the population and to prevent actions that entail violations of the rights of other citizens to health care and a

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Remarks from the participants sitting on their seats.

1. This project is very necessary and profitable for us. And we were lucky that our city was included in the project. Therefore, we support the implementation of this project. We all want the level and quality of life of mahalla residents to improve. We understand that many of our septic tanks are illegally located outside the territory of individual private households. Therefore, we agree to relocate illegally built structures to our house plots at our own expense.

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Based on the results of the speeches at the mahalla gathering of citizens, a Decision was drawn up, which was read out to those present.

DECISION:

1. Participants of the meeting support the project for the construction of a centralized sewerage system in the Ramitan town in the Bukhara region. The participants are aware that sewerage networks, sewage pumping stations and wastewater treatment plants will be built.
2. Participants understand the need to move their septic tanks located on public property to the territory of their household.
3. Households whose septic tanks are located outside the private household must write a statement that they will move their septic tanks at their own expense.
4. The Mahalla Committee is responsible for collecting statements from households. In order to optimize the flow of documents, it is better to make householder statements in tabular form.
5. When the centralized sewerage system is built, all households of the mahalla shall be connected to it.
6. This protocol shall be posted in the building of the Mahalla Committee for public information.
7. The list of this mahalla meeting participants and statements from households for the relocation of their septic tanks at their own expense before the start of construction work is an integral part of these Minutes.

Results of voting for the Decision of Mahalla Citizens' meeting *"Bobul"*

For ***3***

Against ***4***

Abstained ***0***

Secretary	NAME	*F. Olimov (signed)*
Presided by	NAME	*N. Tuymurotova (signed)*

**** The minutes shall be drawn up and signed in 2 copies.*** *for: mahalla, hokimiyat, Bukhoro suv taminoti JSC, district branch of Bukhoro Suv taminoti JSC, PCU, Nicholas O'Dwyer Ltd.*

Protocol

of focus group discussion in the Romitan district center as part of "Development and modernization of sewerage systems in the regional centers of Ghijduvon, Romitan, Karakul, Alat and Karaulbazar" project (1st priority)".

The purpose of the Focus Group Discussion (FGD) was to inform the public about the project and its significance for the population, including vulnerable groups, and to receive feedback on the proposed investments and their social and environmental impact.

Objectives of the FGD:

- to study the perception of FGD participants of the current situation and problems related to water, sanitation and sewerage;

- to Identify key stakeholders

- to identify mechanisms to improve the interaction between service providers and consumers of these services and to maximize the benefits of the proposed investments;

- to find out the opinion of the FGD participants on gender mainstreaming in the project and to mitigate any adverse impacts of the project on the population, in particular on vulnerable groups;

- to determine the willingness and ability of the population to pay for wastewater tariffs;

Local authorities and employees of the Romitan department of Bukhoro Suvtaminot LLC assisted in inviting residents of the project area to the focus group discussion (FGD).

On July 25, 2023, the FGD was held in the meeting room of the Romitan district hokimiyat. The conditions of the FGD were comfortable: all FGD participants sat in the format of a "round table", air conditioning worked in the room, and the participants were offered water.

14 people took part in the FGD, of which 7 were men and 7 women, or 50 % respectively. By occupation 64.3% were employees, 21.4% retired, 14.3% representatives of local authorities, industries, NGOs. All were of working age and the average age of the participants was 52.

In the table below, you can see a list of the FGD participants, occupation, age and contact details.

#	Name	Telephone	Occupation	Age
1.	Ruziev Uktam	996220758	Retired	65
2.	Tursunova Mukhaye	973057496	Mahalla Chairman	47
3.	Khamroeva Mehriniso	936220356	Mahalla Chairman	47
4.	Khasanova Manzura	934751401	MSG resident	56
5.	Imomova Mehriniso	990459329	Resident	58
6.	Yarashova Nigora	931360878	Resident	38
7.	Yarashova dilfusa	991966025	Resident	45
8.	Fatulloev Mukhiddin	997092206	Resident	51
9.	Nazarov Shokir	850545719	Retired	52
10.	Sattorov Rakhmat	919230268	Mahalla employee	53
11.	Saifutdinova Saodat	934705257	Retired	55
12.	Islamov M.	945478828	Representative of the hokimiyat	56
13.	Khujakulova Shukhrat	998330983	Employment Service	40
14.	Atoev Aslan	337063151	Head of SES	48

The FGD was of a public hearing type.

The duration of FGD was 1.5-2 hours

Summary of the discussion

Prior to the discussion, the FGD participants were informed about the project, AIIB's policy on environment and social issues, as well as other socially significant issues.

After that, a number of questions were addressed to the participants of the discussion, intended for today's meeting. The questions were mainly devoted to the current level of drinking water supply to the population, as well as the state of wastewater and related problems. At the same time, discussions were held on the quality of the service provided by the service providers, the culture of requests, and ways *to resolve conflict situations. At the end of the meeting, the issues of the participants' attitude to the planned sewerage network, as well as the readiness of the population to pay for sewerage services were studied.*

We divided the questions posed to the participants into six sections, and they included: water supply and sanitation issues; Problem resolution mechanism;

Assessment of interaction with utility providers; Proposals for improving interaction with Suvtaminot; Mechanism for involving beneficiaries in the project, including women; Willingness to pay for sewerage services.

Section 2: Water supply and Sanitation Issues

First, the floor was given to the representative of the local mahalla committee, then the participants were told the purpose of the survey and what tasks were set.

1. I would like to ask you to name the most important problems related to water supply and sewerage, as well as the quality of the services provided.

Our city today is considered one of the densely populated places of the Bukhara region. From time to time there really are problems with both water supply and sewerage. Many residents have created conditions for themselves, installed pumps to increase the water pressure. (Private) house residents do not have any problems with water supply at the moment. Due to the fact that new pipes were laid, today water is supplied around the clock. But there is still a problem related to sewerage.

So far, there have been no serious complaints about the quality of the service provided by the employees of the district branch of Bukhoro Suvta'minot LLC, because there is no sewerage network yet.

Those who live in multi-storey buildings have a cesspit where wastewater is drained. Each household has their own cesspit and from time to time these pits are cleaned by special trucks of the Bukhara Oil Refinery Plant. The lack of such equipment leads to the fact that during the flight time the smell from the cesspits spreads.

The district branch of Bukhoro Suvtaminot LLC does not have such special equipment.

2. Ask participants to recall who is usually or most often involved in conflicts? Which parties are involved in conflicts? How often do conflicts occur?

To date, there are very few serious conflict situations related to water supply in our area, in the last six months there has not even been such a situation. Since the most of the population are employed in various spheres of the national economy. However, on every street there are families who live in difficult economic situations, who do not have the opportunity to receive water services on time. Neighbors help such residents as much as possible.

Section 3: Problem Resolution Mechanism

Section 3: Problem resolution mechanism

1. How are conflicts usually resolved, and how do they end?

As we said earlier, we do not have any particular conflict situations. And those that do arise end up with a amicable deal between the conflicting parties.

2. **Who usually settles conflicts?**

Usually, such issues are regulated by the Mahalla committee leaders, with the involvement of our mahalla activists and elders of. Mahalla activists usually do not allow any conflict situations to arise. If such situations do arise, an issue will be resolved by searching for *compromise options for the disputed subject.*

Section 4: Assessing interaction with Utility Providers

1. Identify specifics of the relationship between existing enterprises, consumers and other entities?

The Bukhoro Suvtaminot LLC district branch management and employees try and make every effort to avoid occurrence of a shortage and failure in water supply issues. Our city is not big and everyone knows each other, so we can say that the relationship between utility providers and other organizations is quite positive, the most important thing is that everyone pays for the services provided to them on time.

Section 5: Suggestions for Improving Interaction with Suvta'minot

1. Develop citizen engagement mechanisms to strengthen social accountability and inclusion through public awareness; citizens' involvement in services planning and monitoring.

In order to involve citizens in monitoring and social control, it is necessary to establish a continuous relationship between the Bukhoro Suvta'minot district branch and socially active population who will be contributing to the process of providing services to the public. Activists will also monitor the quality of services provided by Bukhoro Suvtaminot. For such purposes, activists are ready to work on a voluntary basis (without being paid)

2. Propose mechanisms and indicators for social monitoring and assessment?

Activists will be selected from each street, who will monitor both the process of construction and reconstruction, and the process of further use of sewerage networks by the population.

Section 6: Mechanism for involving beneficiaries in the project, including women

1. Propose gender-sensitive measures to minimize poverty level and social benefits for both men and women and mitigate any negative impacts;

In construction and further use of the sewerage system, we propose to involve the residents of our city, including women. At least this will contribute to reducing poverty in our city.

Section 7: Willingness to Pay for Sewerage Services

1. Delve into user perceptions and problems related to water supply and sewerage systems;

Water supply and sewerage problems occur on the especially coldest and warmest days. In winter, water supply systems sometimes freeze and sewerage systems evaporate a foul odor very much, especially in the summer. Therefore, it is necessary to speed up construction of the sewerage system.

2. Determine willingness and ability to pay for improved sanitation

If the sanitary and hygienic condition in our city improves, the population will be happy to pay for the provision of sewerage services. In the end, this will serve to improve our city, the sanitary and hygienic culture of the city's population.

DISCUSSION CONCLUSIONS

All FGD participants believe that at the moment the availability of a modern sewerage network in the city is a requirement of the time, and they agree to do all work necessary from them for this.

In Romitan city, there are very few serious conflict situations related to water supply, and for the last six months there has not been such a situation to recall.

Mahalla activists are ready to participate in the public awareness activities about the benefits of the sewerage system, as well as monitor the quality of work during construction.

The Romitan city population expressed their readiness to pay for sewerage services at the established tariff. And they asked to speed up the sewerage system construction.

According to the women participating in this meeting, there is a need to carry out public awareness work among women of the city on the correct use of the sewerage system in order to prevent various accidents and emergencies related to the sewerage system.

The focus group discussion came to a conclusion smoothly, and the moderators thanked all the participants for their time and assistance.

Attached to this document are: photo reports and a list of participants, filled in by themselves.

List of FGD participants with signatures and contact details

Бухоро вилояти Ромитан туманида ўтказилаётган фокус гуруҳ иштирокчилари руйхати

Ўтказилиш санаси: 25.07.2023

Ўтказиш вақти 10:30

Ўтказиш жойи Хокимият маълумотлар залы

Ёш	№	Иштирокчи исм шарифи	Телефон рақами	Иш жойи	Имзо
65	1.	Рўзиев Ўктам	996220752	Нафақада	
47	2.	Турсунова Лухайё Бакиевна	973057496	Замарфиқон М.Ф.Й раиси	
47	3.	Камолова Мехринисо Собировна	936220356	Нотариал идораси	
	4.	Хасанова Монзура Хусайновна	934751401	Садрида ўқи	
38	5.	Имомова Мехриниго	99 045 [illegible]	ИБН Ромитан ф-ли	
45	6.	Ярашева Нигора	931360878	ИБН Ромитан ф-ли	
51	7.	Ярашева Дилфуза	991966015	ИБН Ромитан ф-ли	
52	8.	Ғаттуллоев Мухиддин	99-709226.	ИБН-Сино.	
53.	9.	Назаров Шоир	930054719	Нафақада ИБН-Сино	
54.	10.	Саттаров Ғаҳлаб	91-923-02-68	Нафақада ИБН-Сино	
55	11.	Сайфуддинова Собира	93-470-52-58	Ҳарбиев мажбурий нафақахўр	
56	12.	Назаров М. Н	945478828	Тракторчи. Боғчор	
40	13.	Ғайбуллаев Шукрат	99-8330983	Ромитан ўрта мактаб	
	14.	Атаев Аслон	337063151	ГСК раҳбари	
	15.				
	16.				
	17.				
	18.				
	19.				
	20.				

FGD Photo – 1 Romitan (25.07.2023)








YOSHLAR ISHLARI
AGENTLIGI
MAHALLALARDA YOSHLAR BILAN
ISHLASH MASALALARINI
MUVOFIQLASHTIRISH BO'YICHA


YOSHLAR ISHLARI
AGENTLIGI
MAHALLALARDA YOSHLAR
ISHLASH MASALALARI
MUVOFIQLASHTIRISH BO'Y


MAHALLALARDA YOSHLAR BILAN
ISHLASH MASALALARINI
MUVOFIQLASHTIRISH BO'YICHA

Protocol

of the focus group discussion in the Ramitan district centre within the framework of the Project "Development and modernization of sewerage systems in the Gijduvan, Ramitan, Karakul, Alat and Karaulbazar district centres of the Bukhara region (1st priority)".

On July 25, the FGD (focus group discussions) was held in order to inform the population, study/survey their opinions about the project on social issues and resettlement. In addition, the research examined the level of readiness of the population to support the proposed project implementation, its significance for certain target groups. During the FGD, the participants were informed about the characteristics of the project and the policy of AIIB in relation to resettlement, ecology and other socially significant issues.

The purpose of the focus group discussion (FGD) was to inform the public about the project and its significance for the population, including vulnerable groups of the population, and to receive feedback on the proposed investments and their social and environmental impact.

FGD tasks:

- study the perception of FGD participants of the current situation and problems related to water supply, sanitation and sewerage;

- identify key stakeholders;

- identify mechanisms to improve the interaction between service providers and consumers of these services and maximise the benefits of the proposed investments;

- find out the opinion of FGD participants on gender mainstreaming in the project and mitigation of any adverse project impacts on the population, in particular on vulnerable groups of the population;

- determine the willingness and ability of the population to pay wastewater tariffs;

Local authorities and employees of the Ramitan branch of Bukhoro Suvtaminot LLC assisted in inviting residents of the sub-project zone to a focus group discussion (FGD).

On July 25, 2023, the FGD took place, which was held in an open area of the MSG "Ibn Sino" because at present the building is under repair. The conditions of the

FGD were normal: all participants of the FGD were sitting in the “round table” format, and water was offered to the participants.

9 people took part in the FGD, out of which 2 men (pensioners) and 7 women from the category of economically active population, 22.2% and 77.8% respectively, and the average age of participants was 46 years.

Below the table shows a list of FGD participants, engagement, age and contact details.

№	Name	Phone number	Engagement	Age
1.	Kurbanova Gulnora		Householder	38
2.	Ashirova Marhabo		Teacher	47
3.	Juraev Gulandon		Householder	33
4.	Mullaboeva Nazokat		Pensioner	62
5.	Sobirova Nasiba		Hospital nurse	41
6.	Zakrova Dilfuza		MSG worker	36
7.	Jumaeva Klara		Nursery-school teacher	51
8.	Berdikulova Shahnoza		Householder	47
9.	Rahmonova Kurbanoy		Pensioner	59

The FGD was in the manner of a public hearing.

The duration of FGD was 1.5 hours.

Brief information on the discussion

Prior to the discussion, the participants of the FGD were informed about the project, the AIIB policy on environmental and social issues, as well as other socially significant issues.

After that, a number of questions intended for today’s meeting were addressed to the participants of the discussion. The questions were mainly devoted to the level of provision of drinking water to the population today, as well as the state of wastewater and related problems. At the same time, discussions were held about the quality of service by service providers, the culture of appeals, and ways out of conflict situations. At the end of the meeting, the issues of the participants’ attitude to the designed sewer network, as well as the willingness of the population to pay for sewerage services, were studied.

We conditionally divided the questions asked to the participants of the discussion into six sections, and they included: Problems of water supply and sanitation; Problem resolution mechanism; Evaluation of interaction with utility providers; Suggestions for improving interaction with "Suvtaminot"; Mechanism for involving beneficiaries, including women, in the project; Willingness to pay for sewerage services.

Section No. 2: Problems of water supply and sanitation

First, the representative of the local citizens' meeting started speaking and then the purpose of the survey and what tasks set were outlined to the participants.

1. I ask you to describe the most important problems related to water supply and sewerage, as well as the quality of the service provided.

Mahalla "Ibn Sino" is considered very densely populated in our city today. On the territory of our mahalla, there are big problems with both water supply and sewerage. Many residents have created conditions for themselves, and installed pumps for lifting water pressure. Residents of plots (private houses) have no problems with water supply at the moment. Due to the fact that new pipes have been laid, today water is supplied around the clock. However, the problem related to sewerage is still relevant. In the summer seasons, it is impossible to walk in the yards at all because of the odor that comes from the cesspools. And the place where the population throws garbage does not meet sanitary standards. And we are afraid that children may get sick with various infectious diseases. The population has a lot of complaints about this situation. The service company is not doing its job at all.

So far, there are no serious complaints about the quality of the service provided by the employees of the district branch of Bukhoro Suvtaminot LLC because there is no sewerage yet.

Those who live in multi-storey buildings have a cesspool where wastewater is drained. Each household has its own burial pit and from time to time these pits are cleaned by special machines for the account of householders. The lack of such equipment leads to the fact that the smell of cesspools spreads during the summertime.

The district branch of Bukhoro suvtaminot LLC does not have such special equipment.

2. Ask participants to remember who is usually or most often involved in conflicts. Which parties are involved in conflicts? How often do conflicts occur?

To date, there are very few serious conflict situations related to water supplies in our territory, and those that occur are local in nature and we try to resolve such issues on the place. Since the majority of the population is employed in various spheres of the national economy. Nevertheless, on every street, there are families who live in difficult economic situations, and who are unable to pay for water services on time. Neighbours help such residents whenever possible.

Section No. 3: Problem Resolution Mechanism

1. How are conflicts usually resolved, and how do they end?

As we said earlier, we do not have any special conflict situations. And those that do arise, end mainly with a truce of the conflicting parties.

2. Who usually settles conflicts?

Usually, such issues are regulated by the leadership of MSG, with the involvement of activists and elders of our mahalla. MSG activists usually do not allow any conflict situations to arise. If such situations do arise, the issue will be resolved by searching for compromise options for the disputed subject.

Section No. 4: Evaluation of interaction with utility providers

1. Determine the specifics of the relationship between existing enterprises, consumers and other entities.

The management and employees of the district branch of Bukhoro Suvtaminot LLC are trying and making every effort to avoid the occurrence of shortages and failures in water supply issues. The relationship of utility providers with other organizations is not always quite positive, the most important thing is that everyone pays in a timely manner for the services rendered to them.

The essence of the complaints of the population to the local representatives of Bukhoro suvtaminot LLC is that they had to 24/7 mode on water supply issues. For a long time, we have been receiving water in the mode of 2 hours in the morning and 2 hours in the evening, respectively. It is especially difficult in the summer.

Section No. 5: Suggestions for improving interaction with Suvtaminot

1. Develop citizen engagement mechanisms to strengthen social accountability and inclusivity through public information; involve citizens in planning and monitoring services.

In order to involve citizens in monitoring and social control, it is necessary to establish a continuous relationship between the district branch of Bukhoro Suvtaminot and the socially active population, which will contribute to the process

of providing services to the population. Activists will also monitor the quality of services provided by Bukhoro Suvtaminot. For such purposes, activists are ready to work on a voluntary basis (without wages).

2. Propose mechanisms and indicators for social monitoring and evaluation.

Activists will be selected from each street, who will control both the process of construction and reconstruction and the process of further use of sewer networks by the population.

Section No. 6: Mechanism for involving beneficiaries, including women, in the project

1. Propose gender-sensitive measures to maximize the reduction of poverty and social benefits for both men and women and mitigate any negative consequences;

During the construction and further use of the sewer system, we propose to involve residents of our city, including women. At least this will help to reduce poverty in our city.

Section No. 7: Willingness to pay for sewerage services

1. Delve into the perception of users and problems related to water supply and sewerage systems;

Problems with water supply and sewerage arise especially on the coldest and warmest days. In winter, water supply systems sometimes freeze, and sewage systems very much evaporate an unpleasant odour, especially during summertime. Therefore, it is necessary to accelerate the construction of the sewerage system.

2. Determine the willingness and ability to pay for improved sanitation

If the sanitary and hygienic condition in our city improves, the population will pay with the convenience for the provision of sewage services. In the end, this will serve the improvement of our city, and increase the sanitary and hygienic culture of the city's population.

CONCLUSIONS OF THE DISCUSSION

All FGD participants in this discussion believe that at the moment the availability of a modern sewer network in the city is a requirement of the time, and they agree to do all the required work for this.

There have been very few serious conflict situations related to water supplies on the territory of Ramitan city, such a situation has not even been recalled for the last six months.

Activists of MSG are ready to participate on a voluntary basis in agitation among the population about the benefits of the sewer system, as well as, if necessary, to participate in quality control of work during construction.

The population of Ramitan city expressed their willingness to pay for sewage services at the established tariff. And they asked for the acceleration of the construction of the sewer system.

According to the women participants of this meeting, there is a need to conduct explanatory work among the women of the city on the proper use of the sewer system in order to prevent various accidental and emergency situations associated with the sewerage system.

The focus group discussion smoothly came to an end, and the moderators thanked all the participants for their time and assistance.

Attached to this document are: photo reports and a table of the list of participants filled in by the participants themselves.

Photo FGD – 2 Ramitan (25.07.2023)









ANNEX 4 – CHANCE FIND PROCEDURE

CHANCE FIND PROCEDURE

This attachment to the ESIA includes the Chance Find Procedure, which shall be followed upon encountering any potential cultural heritage or archaeological features with regards to the Project.

If any Contractor/Subcontractor worker discovers a physical cultural resource, such as (but not limited to) archaeological sites, historical sites, remains and objects, or a cemetery and/or individual graves during excavation or construction, the following steps shall be taken:

1) Stop all work in the vicinity of the finds/remains and create a protection buffer around the area to avoid damaging the site/finds/remains with potential archaeological and heritage importance and ensure that no workers enter the area or continue construction activities;

2) Immediately notify the Contractor HSE Coordinator about the potential chance find;

3) Workers, including the Contractor HSE Coordinator are not allowed to alter in any way the find and the only actions that may be performed are those necessary to guarantee safety of workers;

4) The Contractor HSE Manager shall inform the Competent Institution (Bukhara State University Department of Archaeology and History of Bukhara) within 24 hours from the time of discovery;

5) The Contractor HSE Manager shall provide the Competent Institution with full access to the find collaborate with the Competent Institution on future construction activities in the vicinity. The HSE Manager shall also provide relevant safety trainings and inductions to representatives of the Competent Institution prior the Competent Institution commencing their investigation.

6) Based on outcomes of the investigations performed, the Competent Institution, in consultation with the Contractor HSE Manager and any other archaeological experts involved will decide how to handle the finding. This could include result changes to the layout of the Project (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage;

7) If required by the Competent Institution, the Contractor HSE Manager, in collaboration with the contractors and subcontractors, shall implement all necessary actions included in the decision;

8) Construction works can resume only after written permission is granted by the Competent Institution; and,

9) The HSE Manager shall ensure that any required corrective action following a chance find event is carried out. The Contractor HSE Coordinator and HSE Manager, should ensure a report is prepared to document each chance find and the actions taken thereafter. These files should be available for the duration of the construction period.

ANNEX 5 – RAMITAN PROJECT FUEL, LNG AND ELECTRICITY USAGE VALUE

ANNEX 5. Ramitan Project Fuel, LNG and Electricity Usage Value

Date/Year	Electricity (Kw)	LNG (tone)	Fuel (Lt)
January 2025			
Total Previous Months			
GRAND TOTAL			

ANNEX 6 - TOPSOIL AND SUBSOIL REGISTER FORM

ANNEX 6. Topsoil and Subsoil Register Form

No	District	Village	Start Km	End Km	Total Amount of Topsoil (m3)	Total Amount of Subsoil (m3)
1	Ramitan		0+000	2+250		59
2	Ramitan		2+250	7+600		189
3	Ramitan		7+600	9+950		24

ANNEX 7 - RECORDS EXAMPLE TABLE FOR POTABLE AND DRINKING WATER

ANNEX 7. Records Example Table for Potable and Drinking Water

Project Potable Water Usage Amount by Month

Location	Date	Source	Amount (m^3)
Camp Site	January 2025	Well	6.060
Camp Site	January 2025	Municipality	1.985
Total Previous Months			**65.675**

Drinking Water Usage Amount by Month

Location	Date	Source	Amount (m^3)
Camp Site	January 2025	Demijacana,	50
Camp Site	January 2025	Closed Bottle	100
Total Previous Months			**150**

ANNEX 8 - COORDINATES OF GROUNDWATER BASELINE AND MONITORING MEASUREMENT POINTS

ANNEX 8. Coordinates of Groundwater Baseline and Monitoring Measurement Points

Location	Date	Region	Coordinate	
			West	North

ANNEX 9 - COORDINATES OF AIR QUALITY BASELINE AND MONITORING MEASUREMENT POINTS

ANNEX 9. Coordinates of Air Quality Baseline and Monitoring Measurement Points

Location	Date	Region	Coordinate	
			West	North

ANNEX 10 - COORDINATES OF NOISE AND VIBRATION BASELINE AND MONITORING MEASUREMENT POINTS

ANNEX 10. Coordinates of Noise and Vibration Baseline and Monitoring Measurement Points

Location	Date	Region	Coordinate	
			West	North

ANNEX 11 - CULTURAL HERITAGE AND CHANCE FIND PROCEDURE

ANNEX 11. Cultural Heritage and Chance Find Procedure

Chance Find Register

Form No	Finding Date	Summary of Chance find	Name of the Reported Authority	Precautions Taken	Is the Chance Find Form Completed?	Status Open or Closed	Explanations
1							
2							

ANNEX 12 - TREE AND CRITICAL AREA REGISTER (EXAMPLE)

ANNEX 12. Tree and Critical Area Register (Example)

No	District	Village	Start Km	End Km	Number of Tree (Unit)	Number of Species Translocated (Unit)
1	Ramitan	Tree Important Area	0+000	2+250	15 (3 of them will be cut, 5 of them will be translocated, at Km 2+005 Avoidance applied and Project plan changed)	
2	Ramitan	Scorpian Important Area	2+250	7+600		3 was carred at 25.03.2025, 3 dead due to Project activiteies
3	Ramitan		7+600	9+950		24

ANNEX 13 - EXAMPLE FOR WASTE REGISTRATION FROM A CONSTRUCTION SITE

ANNEX 13. Example for Waste Registration from A Construction Site

WASTE DISPOSAL DATE	WASTE CODE	WASTE TYPE	AMOUNT (KG)	NAME OF THE LICENSED COMPANY WHERE IT IS DISPOSED OF
22.11.2023	15 01 01	Paper Cardboard Packaging	420	X RECYCLING
13.09.2024	16 07 09	Wastes containing other hazardous substances	1100	X Petroleum Products
17.09.2024	13 02 08	Waste Oil	15600	X Petroleum Products
11.10.2024	15 01 01	Paper Cardboard Packaging	250	RECYCLING
11.12.2024	08 03 17	Waste Printing Toners Containing Hazardous Substances	50	X Petroleum Products
25.12.2024	18 01 03	Medical Waste	35	Y Environmental Technologies Company
08.01.2025	18 01 03	Medical Waste	8	Y Environmental Technologies Company
TOTAL			104.372	

ANNEX 14 - EXAMPLE FOR PERMIT REGISTER

ANNEX 14. Example for Permit Register

Permit Status of Temporary Associated Facilities

Name of the Permit	Type of the permit/license/consent	Responsible Party	Applicable Regulations	Permit Status
Pasturelands Permits	Permit for the use of pasture lands (change of the allocation purpose)	Related Governmental Authorities	Pasture Law (Law No: 4342, 1998)	Ongoing
Permit for the use of agricultural lands for non-agricultural purposes	Permit		Regulation on the Application of the Law on Soil Protection and Land Use Regulation on the Conservation, Use and Planning of Agricultural Lands	Contractor made the application to Client on 5 December 2022 to start the process. Client made the applications to related authority on 24 December 2022
Approval of expropriation plans	Approval		Expropriation Law (Law No: 2942, 1983)	
Forestry Permits	Permit		Forestry Law (Law No:6831, 1956)	
Immediate Expropriation Decision	Decree			
Permit for Construction Camp Sites Operations	EIA Decisions for relevant construction camp site facilities	Client	Regulation on Environmental Impact Assessment	
	Workplace notification for construction camp sites	Client	Regulation on Starting Up and Operating a Workplace	
Permit for on-site fuel	Permit	Client	Regulation on Environmental Impact Assessment	
WWTP Project Approval	Approval	Client	Wastewater Treatment/Deep Sea Discharge Project Approval circular numbered (2018/14) dated 20.11.2018.	
Discharge Permit (for Treated WW)	Permit	Client	Regulation on Environmental Permits and Licenses	
Temporary Waste Storage permit (for temporary storing up to 180 day)	Permit	Client	Regulation on Environmental Permits and Licenses	

Environmental Permit	Permit	Client	Regulation on Environmental Permits and Licenses	
Approval for waste management plans	Approval	Client	Waste Management Regulation	
Agreements made with licensed waste management and disposal companies	Agreement	Client	Waste Management Regulation	
Groundwater abstraction Permits	Permit	Client	Law on Groundwater Resources (Law No. 167, 1960)	

ANNEX 15 – INDICATIVE PRICING FOR ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN AND ENVIRONMENTAL AND SOCIAL MONITORING PLAN

ANNEX 15

Table 1: Indicative Pricing for Environmental and Social Management and Monitoring Plan for Ramitan

Cost item	Quantity	Unit cost (USD)	Total cost (USD)	Comments
A) Environmental Monitoring (should include pre-construction stage studies and also construction stage)				
Air quality (Settled Dust, PM 10, PM 2.5)	16 (Monitoring at two location points (one at WWTP site; within urban environment at pumping station sites-2 locations (5 indicators=1 test) x 8 times/2 years) and - 88 (11 locations (5 indicators=1 test) x 8 times/2 years, quarterly)	350 / test	36,400	costs are included in the civil works contract
Acoustic environment (Noise and Vibration)	264 (11 locations x 1 (daytime)) and 30 (If there is any extra construction works or any complaints)	300 / test	79 ,200	costs are included in the civil works contract
Surface Water Quality (upstream and downstream)	48 Months (2 locations x times, reporting quarterly)	300 / test (monthly)	58,000	costs are included in the civil works contract
Surface Water Quality (at Collector outfall point)	24 (1 location x 24 times, reporting quarterly)	300 / test (monthly)	7,200	costs are included in the civil works contract
Surface water quality, during construction at 5 Key water bodies during construction at specific canal and river sites in Ramitan	30 (10 (5 canal and 5 river areas at work-sites) x 3 times (before, during, after site specific construction)	300/test (quarterly)	9,000	Costs included in Civil works contract for the specific waterways and canals at the exact time of construction on the specific site.
Groundwater (If there is any drinking water well)	16 (8 wells x 2 times , one before construction and one after construction)	300 / test (quarterly)	4,800	costs are included in the civil works contract
Soil quality	Minimum 2 samples per each of the camp site plus WWTP (baseline and Project completion) 4 (1 Camp Site Basin+ 1 WWTP) x 2 times/2 years, one before construction and one after construction	2,000 / test	8,000	costs are included in the civil works contract
Effluent water quality sampling	Quarterly- over 2 Trail Operation Years 8 (1 locations x 8 times, quarterly)	1,000 / day	8,000	Refer to BoQ and WWTP approved Design
Aquatic species survey report	One survey preconstruction	Lump Sum (Maximum)	7,000	Lump Sum for 1-study
Biodiversity site survey report	One walkover survey Ecology monitoring during preconstruction stage	Lump Sum (Maximum)	7,000	Lump Sum for 1 study
Archaeological and cultural asset site survey	One walkover survey Archaeological and cultural asset monitoring during preconstruction stage	Lump Sum (Maximum)	7,000	costs are included in the civil works contract
		Sub-Total (Environmental Monitoring) - A	**231,600**	
B) Staffing				
Environmental and Social Specialist	24 months x23 lots	Lump Sum	96,000	costs are included in the civil works contract
Health and Safety Specialist	24 months x 2 lots	Lump Sum	96,000	costs are included in the civil works contract
		Sub-Tota (Staffing)l - B	**192,000**	
c) Environmental and Social Training and Capacity Building Activities				
Training in preparation of Site-Specific Environmental and Social Management Plan	2 days (1 day for Network Construction1 lots and 1 for WWTP)	500	1,000	costs are included in the PMC contract

Cost item	Quantity	Unit cost (USD)	Total cost (USD)	Comments
Training in waste disposal practices and procedures, including training on hazardous waste management	2 days(1 day for Network Construction1 lots and 1 for WWTP)	500	1,000	costs are included in the civil works contract
Training in OHS during construction including equipment and machinery maintenance, specific hazards of their work, first aid, basic sanitation and health care, and environmental protection	2days (1 day for 1Network contracts Construction and 1 for WWTP)	750	1,500	costs are included in the civil works contract
Training on O&M of new SPSs and infrastructure, including O&M of SPSs, sewer mains, and network	2 days(1 day for Network Construction 1 lots and 1 for WWTP)	1,400	2,800	costs are included in the civil works contract
Training on O&M of new WWTP infrastructure, including O&M of WWTP	7 days training at the completion of the WWTP commissioning	4,900	4,900	costs are included in the civil works contract
Training on OHS during the operation of new infrastructure, including public safety aspects	Lump sum	2,000	2,000	costs are included in the civil works contract
Training in code of conduct, engaging with the local community, community health and safety, and GBV risks	9 Makhalas -1 training each maximum lump sum	300	2,700	costs are included in the civil works and PMC contracts
Training in emergency preparedness and risk management for construction staffs	2 Lots	1,500	3,000	costs are included in the civil works contract
Training in emergency preparedness and risk management for operation staffs	1 lump sum	1,500	1,500	Water utility's costs
Training in cultural resources management, including Chance Find Procedure	2 Lots (include Specialist trainer fees	1,500	3,000	costs are included in the civil works and PMC contracts
Community consultation meetings	9 Makhalas -1 training each maximum lump sum	600	5,400	costs are included in the PMC contract
Behavior Change Communication activities	9 Makhalas -1 training each maximum lump sum	600	5,400	costs are included in the PMC contract
Mass media campaign	112 campaigns - 4 per year x 9 Ma	200	1,800	1costs are included in the PMC contract
Training on gender and GAP awareness to contractor(s)	1 training each for 2Lots	600	1200	costs are included in the PMC contract
Gender and GAP awareness training to water utility and PCU personnel	2 training	1,400	2,800	costs are included in the PMC contract
Training in gender equality and skills development	1 training	500	500	costs are included in the PMC contract
(C) Sub-Total (Environmental and Social Training and Capacity Building Activities			**40,500**	
D) Subtotal (A+B+C)			**464,100**	
E) 10% of D - Miscelaneous			**46,410**	*10% of Subtotal*
Grand Total – (D+E)			**510,510**	

Note:

***These are only indicative costs, the tenderers should check the unit prices, based on 3 contracts in Karakul District mentioned in the ESIA text**

***General requirement for water monitoring testing is 300-500m up- and down- stream plus at the outfall point of collector. This will monitor and show contaminants (if any) that are run-off from the WWTP and associated outfall collector system, during construction; and provide an indicative baseline at the collector point for when operation of WWTP starts.**

***The budget calculations required for the environmental and social work to be carried out during the construction works will be made by the construction company, taking into account this table. The calculated budget is within the budget defined for the tender.**