

Updated Initial Environmental Examination

Project Number:50259-002

April 2025

UZBEKISTAN: Western Uzbekistan Water Supply System Development Project

Prepared by: JSC "Uzsuvtaminot" for the Asian Development Bank for the Asian Development Bank. This is an updated version of the posted in December 2021 available on https://www.adb.org/sites/default/files/project-documents/50259/50259-002-iee-en_1.pdf.

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CURRENCY EQUIVALENTS

(as of 01 April 2025)

Currency unit	–	Sum (SUM)
SUM1.00	=	\$0.000091
\$1.00	=	UZS12,937.16

ABBREVIATIONS

ADB	–	Asian Development Bank
CEE	–	Center for Environmental Expertise
CSA	–	Kommunkhizmat Agency
DDC	–	Detailed Design Consultant
EIA	–	Environmental Impact Assessment
EMP	–	Environmental Management Plan
GRM	–	Grievance Redress Mechanism
IEE	–	Initial Environmental Examination
MHCS	–	Ministry of Housing and Communal Services
NRW	–	Non-Revenue for Water
OCS	–	Operational Control System
PMC	–	Project Management Consultant
PCU	–	Project Coordination Unit
PPE	–	Personal Protective Equipment
Project	–	Western Uzbekistan Water Supply System Development Project
QST-LLC	–	Qoraqalpoq Suv Ta'minoti LLC
SCADA	–	Supervisory Control and Data Acquisition
SEE	–	State Environmental Expertise
SSEMP	–	Site-Specific Environmental Management Plans
SPS	–	ADB Safeguard Policy Statement 2009
Uzsuvtaminot	–	Joint Stock Company Uzsuvtaminot or Executing Agency
WDU	–	Water Distribution Unit

WEIGHTS AND MEASURES

m ³	–	cubic meter
dBA	–	decibel audible
°C	–	degree Celsius
m	–	Meter
mg/l	–	milligram per liter
mm	–	millimeter
m ²	–	square meter

NOTE

In this report, "\$" refers to US dollars

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EXECUTIVE SUMMARY

1. The Government of Uzbekistan (GoU) implements the [Western Uzbekistan Water Supply System Development Project](#) with financial assistance from the Asian Development Bank (ADB). This project aims to enhance the water supply system to meet the growing demand for drinking water while improving the quality and reliability of supply for consumers. The initiative focuses on providing better water supply services to residents in the Republic of Karakalpakstan through two outputs: (i) water supply infrastructure rehabilitated, expanded and upgraded and (ii) Institutional capacity strengthened.
2. Under Output 1, the project scope includes (i) construction, rehabilitation, and expansion of three water treatment plants (WTP) – Mangit, Tuyamuyun, and Takhiatash WTPs; (ii) construction and rehabilitation of approximately 300 kilometers of water mains; (iii) construction of four new water distribution centers and rehabilitation of 24 water distribution stations; (iv) construction and rehabilitation of approximately 900 kilometers of water distribution network; and (v) provision of individual water-meters. The project design also foresees construction of district-level water utility offices and repair of existing Dispatcher Control Center to be acted as SCADA building for the newly constructed and rehabilitated water collection and distribution facilities. The project interventions will cover six districts of the Republic of Karakalpakstan – Amudarya, Beruni, Nukus, Karauzyak, Kungrad, and Muynak.
3. The project activities are composed of ten procurement packages comprising civil work, equipment and machinery supply, and provision of associated services:
 - Subproject #WU-CW-01: Water Supply Improvement in Amudarya District
 - Subproject #WU-CW-02: Water Supply Improvement in Beruni District
 - Subproject #WU-CW-03: Water Supply Improvement in Nukus District
 - Subproject #WU-CW-04: Water Supply Improvement in Karauzyak District
 - Subproject #WU-CW-05: Water Supply Improvement in Kungrad District
 - Subproject #WU-CW-06: Water Supply Improvement in Muynak District
 - Subproject #WU-CW-07: Construction of Mangit WTP
 - Subproject #WU-CW-08: Rehabilitation of Tuyamuyun PS
 - Subproject #WU-CW-09: Extension of Takhiatash WTP
 - Subproject #WU-CW-10: Nono-Revenue Water (NRW) Equipment and Operational Control Systems (OCS).
4. Under Output 2, the project design includes (i) formulating performance indicator-based reporting; (ii) establishing a training center; (iii) operationalizing a nonrevenue water control system, geographic information system, and hydraulic modeling; (iv) introducing web-based management and reporting systems; and (v) commissioning a grievance redress mechanism.
5. The Project is implemented by Qaraqalpaq Suw Ta'minoti LLC (QST-LLC) with Project Coordination Unit (PCU) set under Uzsuvtaminot JSC, implementing agency responsible

- for management of water and wastewater infrastructure and services in Uzbekistan. PCU is fully staffed and comprises full-time PCU Head and Water Supply Specialist and two part-time Social and Environmental Safeguards Specialists. The Regional Project Coordinator is set up in Nukus city, the capital of the Republic of Karakalpakstan, to manage day-to-day project implementation at the subprojects and district levels.
6. The project is also supported by two consultant teams since 2022:
 - Project Engineer – Royal Dezain Loyiha LLC, Uzbekistan
 - Project Management Consultant – Consortium of K-Water, Hankook Engineering, and Global Business Services.
 7. The current report provides an initial environmental examination (IEE) for Subproject #WU-CW-10: NRW Equipment and OCS (subproject). The IEE is prepared due to the change in the project design in compliance with ADB's Safeguard Policy Statement (2009) and applicable regulatory framework of Uzbekistan. The subproject scope comprises building repair and development of an integrated operation monitoring and control system (SCADA).
 8. The IEE indicates that the proposed activities will not result in any significant adverse environmental or social impacts that are irreversible, diverse, or unprecedented. The identified impacts are site-specific, minimal, localized, short-term, and reversible. These primarily concern the health and safety of workers and nearby communities, as well as potential pollution and disturbances that may arise from inadequate site management and sanitation infrastructure. It is expected that no adverse environmental or social effects will occur, and that mitigation measures can be implemented through uncomplicated strategies commonly employed at construction sites and well-known by civil works contractors. Therefore, this subproject has been classified as Category C according to the ADB SPS (2009).
 9. According to Uzbekistan [Regulation No.541](#), the repair of administrative buildings falls under Category IV and requires a rapid environmental assessment (REA). A report must be submitted to the Center of Environmental Expertise (CEE) within the Ministry of Ecology, Environmental Protection, and Climate Change. It is mandatory to obtain CEE approval for the subproject before commencing any physical activities related to it.
 10. Potential impacts and risks during construction can be effectively mitigated by adopting internationally recognized best practices for environmental and social management, as outlined in the International Finance Corporation (IFC) Environmental, Health, and Safety (EHS) Guidelines, along with relevant regulations in Uzbekistan. Additionally, the selection of equipment and materials will adhere to best international practices for procuring environmentally friendly and energy-efficient options, aimed at minimizing indoor pollution and reducing greenhouse gas emissions.
 11. This IEE has been prepared to document the environmental and social impacts of the subproject #WU-CW-10, define the measures required for the mitigation and monitoring of those impacts, and includes the environmental code of practice (ECP) for implementation.

12. The ECP has been developed for anticipated minor impacts and small-scale civil works associated with the repair of the Central Dispatcher Station building, as part of Subproject #WU-CW-10: NRW Equipment and OCS. It provides guidance for planning and implementing mitigation measures that the contractor and water utility will follow during civil work and building operation. The ECP also outlines standard practices and procedures for managing potential impacts on the local environment through the following sections:
 - ECP 1: Waste Management
 - ECP 2: Fuels and Chemicals Management
 - ECP 3: Air Quality Management
 - ECP 4: Water Resource Management
 - ECP 5: Road Transport and Road Traffic Management
 - ECP 6: Construction Camp Management
 - ECP 7: Worker Health and Safety.
13. The ECP will be included in the bidding and contract documents for Subproject #WU-CW-10. The contractor will be informed of this obligation and will bear the cost of ECP by implementing the necessary measures which are included in the overall construction cost. The ECP will be made available to the project personnel in Karakalpak and Uzbek.
14. Grievance redress mechanism (GRM) will enable stakeholders to raise grievances about the subproject #WU-CW-10 and seek redress when stakeholders perceive an adverse impact arising from the subproject activities. The project-level GRM and [ADB Accountability Mechanism](#) set out clear systematic steps for affected individuals and communities to submit complaints and feedback and simultaneously for the project to respond to queries, feedback, and complaints received. The GRM guarantees the project is responsive to any concerns and grievances, particularly from affected stakeholders and communities.
15. This IEE with the ECP is considered sufficient to meet the environmental assessment requirements of ADB for the Category C project. Any changes to the subproject design will be subject to ADB review, clearance, and disclosure.

1. INTRODUCTION

1.1. Background

16. The Western Uzbekistan Water Supply System Development Project (the Project) supports the ongoing efforts of the Government of Uzbekistan to improve water supply services in the Republic of Karakalpakstan. The Project aims to enhance environmental sustainability, climate resilience, and social confidence in six project districts (Amudarya, Beruni, Nukus, Karauzyak, Kungrad, and Muynak) by providing reliable and safe water supply and improved sewerage and sanitation facilities. The Project will also strengthen the capacity and infrastructure governance of the water utility company managing water and wastewater systems in Western Uzbekistan.
17. The Western Uzbekistan Water Supply System Development Project comprises the following outputs:
 - **Output 1:** Water supply infrastructure rehabilitated, expanded and upgraded. This output comprises the (i) construction, rehabilitation, and expansion of three WTPs; (ii) construction and rehabilitation of approximately 300 kilometers of water mains; (iii) construction of four new water distribution centers and rehabilitation of 24 water distribution stations; (iv) construction and rehabilitation of approximately 900 kilometers of water distribution network; and (v) provision of consumer meters.
 - **Output 2:** Institutional capacity strengthened. This output includes (i) formulating performance indicator-based reporting; (ii) establishing a training center; (iii) operationalizing a nonrevenue water control system, geographic information system, and hydraulic modeling; (iv) introducing web-based management and reporting systems; and (v) commissioning a grievance redress mechanism.
18. The project has been implemented since 2017 and is funded by the Asian Development Bank (ADB). During the project feasibility study, the Executing Agency was the Kommunkhizmat Communal Services Agency (CSA) with a designated Project Coordination Unit (PCU). However, the CSA was dissolved following President Decree No. UP-4883¹ (Article 8, para 1), and the PCU was transferred under the command of the newly established Uzsuvtaminot Joint Stock Company (Uzsuvtaminot) following President Order No. UP-5883². In the meantime, pursuant to Government Resolution No. 169,³ Uzsuvtaminot has been assigned as the Executing Agency of the Project. Following the restructuring, the Implementing Agency (the State Unitary Enterprise Department for

¹ President Decree No. UP-4883, On ensuring the effectiveness of investment projects implemented at the expense of public debt (Article 8, para 1), 06.11.2020

² President Order No. UP-5883, On measures to improve the management of water resources of the Republic of Uzbekistan to increase the level of supply of drinking water to the population and improve its quality (Article 5, para 3), 26.11.2019, <https://lex.uz/docs/4611203>

³ Article 3a of Government Resolution No. 169, On the establishment of the agency for international cooperation and development under the Ministry of Investment and Foreign Trade of the Republic of Uzbekistan, 30.03.2021, <https://lex.uz/docs/5350631>

Operation of Interregional Water Supply Tuyamuyun-Nukus) was renamed Qoraqalpoq Suw Ta'minoti Ltd (QST-LLC).

19. PCU is fully staffed and responsible for the project's overall management, implementation, and monitoring. A regional project management office manages day-to-day project implementation at the Republic of Karakalpakstan level.
20. The Project Management Consultant (PMC) and Project Engineer are hired to support the PCU and QST-LLC. The PMC has been on board since August 2020 and provides comprehensive consultation, assistance, and support in project implementation. The Project Engineer is responsible for engineering surveys and the preparation of detailed engineering designs for selected sub-projects.
21. The project finances the rehabilitation and new construction activities in six project districts under the following eight packages/sub-projects:
 - Subproject #WU-CW-01: Water Supply Improvement in Amudarya District
 - Subproject #WU-CW-02: Water Supply Improvement in Beruni District
 - Subproject #WU-CW-03: Water Supply Improvement in Nukus District
 - Subproject #WU-CW-04: Water Supply Improvement in Karauzyak District
 - Subproject #WU-CW-05: Water Supply Improvement in Kungrad District
 - Subproject #WU-CW-06: Water Supply Improvement in Muynak District
 - Subproject #WU-CW-07: Construction of Mangit WTP
 - Subproject #WU-CW-08: Rehabilitation of Tuyamuyun PS
 - Subproject #WU-CW-09: Extension of Takhiatash WTP
 - Subproject #WU-CW-10: NRW Equipment and OCS.
22. The project's initial environmental examination (IEE) was prepared in 2017⁴ and included the environmental management plan (EMP), outlining the specific environmental measures to be adhered to during the project implementation. The IEE has identified potential local adverse environmental impacts that may arise during construction and rehabilitation activities. Most potential negative impacts (dust, noise, vibration, solid waste, etc.) will be mitigated during project implementation by (i) protecting the sources, (ii) minimizing construction pollution and waste, and (iii) limiting specific impacts related to the pipeline routes. Considering IEE findings, the project was classified as Environmental Category B following ADB SPS.

1.2. Purpose of this Updated Initial Environmental Examination

23. This initial environmental examination (IEE) and environmental management plan (EMP) updates and covers **Subproject #WU-CW-10: NRW Equipment and OCS**. The scope of the IEE included the following features:

⁴ [Western Uzbekistan Water Supply System Development Project: Initial Environmental Examination | Asian Development Bank \(adb.org\)](#)

- Assess the project area's environmental and socio-economic conditions, including identifying.
 - Identify anticipated potential impacts of Subproject # WU-CW-10 on the physical, biological, and socio-economic environment.
 - Propose appropriate mitigation and monitoring measures incorporated into the EMP to avoid or minimize the project's identified potential impacts.
24. The information in this updated IEE is based on field visits, stakeholder consultations, key informant interviews conducted, and secondary sources of information collected by PMC's international and national environmental specialists. Site visits and meetings were undertaken in December 2024 and January-March 2025 to assess the proposed features of the SCADA facility and the current site conditions surrounding it, check the presence of settlers and other sensitive receptors, validate the location of waterways, drainage, and flood control structures, types of vegetation, and other environmental issues that need to be addressed in the IEE.
25. As part of due diligence, a meeting was held with the Karakalpak Republican Ministry of Ecology, Environmental Protection, and Climate Change (MEEPCC) to discuss the environmental requirements for Subproject #WU-CW-10 and any issues related to climate change, flooding, biodiversity, and other immediate surroundings of the existing SCADA facility. Environmental approval related to Subproject #WU-CW-10 was also discussed during the meeting.
26. Secondary data on the project area's physical, biological, and socio-economic conditions were gathered from statistical records and internet sources.

2. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1. ADB's Environment Safeguards Policies

27. The [ADB SPS \(2009\)](#) outlines the requirements for assessing and mitigating impacts, preparing environmental assessment reports, disclosing information and stakeholder consultations, establishing a grievance redress mechanism (GRM), and monitoring and reporting. Specific environmental safeguard requirements apply to biodiversity conservation and sustainable management of natural resources, pollution prevention, worker and community health and safety, and conservation of physical and cultural resources.
28. **Screening and Categorization:** Every project is initially categorized for potential environmental impacts and risks:
- Category A – If a project is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. A full-scale environmental impact assessment (EIA), including EMP, is required to address these impacts.

- Category B – if a project's environmental impacts are less adverse and fewer in number than those of category A projects. These impacts are site-specific, and few of them are irreversible. In most cases, mitigation measures can be designed more readily than for category A projects. An IEE is required.
- Category C – if a proposed project has minimal or no adverse environmental impacts. No EIA is required, although environmental implications need to be reviewed.
- Category FI – if a project involves investing ADB funds in or through a Financial Intermediary (FI).

29. **Safeguard Requirements.** ADB adopts a set of the following four specific requirements that the project must meet to address environmental and social impacts and risks:

- Safeguard Requirements 1: Environment
- Safeguard Requirements 2: Involuntary Resettlement
- Safeguard Requirements 3: Indigenous Peoples
- Safeguard Requirements 4: Special Requirements for Different Finance Modalities.

ADB reviews the project through due diligence, review, and supervision to ensure compliance with these requirements during project preparation and implementation.

30. **Rapid Environmental Assessment (REA).** REA is a tool used to determine a project's environmental category, which is crucial for deciding the level of environmental assessment required. It uses a checklist to assess the project's characteristics, location, and environmental issues and concerns. The REA checklist helps determine the environmental category of a proposed project. The checklist also considers social dimensions, such as involuntary resettlement, Indigenous Peoples, poverty reduction, consultation, and gender issues.

31. A rapid environmental assessment questionnaire was used during site surveys. It showed that the impacts during construction are minimal, localized, short-term, and reversible. The identified impacts relate to the health and safety of workers and adjoining communities, and pollution and disturbance that could arise from poor site management and inadequate sanitation infrastructure. The proposed activities are not expected to have any adverse environmental impact. Therefore, the subproject was classified as Category C according to the ADB Safeguard Policy Statement (2009), with no environmental assessment required.

32. The updated IEE with ECP covers the work scope under Subproject #WU-CW-10: NRW Equipment and OCS, which now includes repairing the existing building and equipping it with a SCADA system and classroom furniture and training equipment.

33. **Public disclosure:** ADB SPS requires the borrower to provide relevant environmental and social assessment information on time, in an accessible place, and in a form and language(s) understandable to affected people and other stakeholders.

34. Upon the clearance of the documents, the IEE and other safeguard documents in English and local languages will be available on the websites of Uzsuvtaminot JSC and ADB as part of information disclosure.

2.2. IFC's Environmental, Health, and Safety Standards

35. The World Bank Group's [General Environmental, Health, and Safety Guidelines](#) (EHS Guidelines) are technical reference documents with general and industry-specific examples of Good International Industry Practice. General EHS Guidelines are organized into four parts, including references and additional sources that are used. Part 1 of the General EHS Guidelines outlines the performance levels and measures that need to be controlled and recommends mitigation and management measures to address impacts and risks. These measures include monitoring air emissions and ambient air quality, energy conservation, wastewater and ambient water quality, water conservation, hazardous materials management, waste management, noise, and contaminated land. The EHS Guidelines should be applied based on the hazards and risks identified for each project. This is determined through an environmental assessment that considers site-specific factors, including the host country context, the environment's capacity to assimilate, and other project-related variables. Part 2 and Part 3 provide recommendations on management and mitigation measures for occupational health and safety and community health and safety, respectively. Part 4 of General EHS Guidelines, Construction, and Decommissioning, among other instructions and recommendations, provides techniques for prevention, minimization, and control of construction and decommissioning activities that may pose the potential for the release of petroleum-based products, such as lubricants, hydraulic fluids, or fuels during their storage, transfer, or use in equipment. Such methods include:
- Providing adequate secondary containment for fuel storage tanks and temporary storage of other fluids, such as lubricating oils and hydraulic fluids.
 - Using impervious surfaces for refueling areas and other fluid transfer areas.
 - Training workers in correctly transferring and handling fuels and chemicals and responding to spills.
 - Providing portable spill containment and cleanup equipment on site and training in the equipment deployment.
 - Assessing the contents of hazardous materials and petroleum-based products in building systems (e.g., polychlorinated biphenyls containing electrical equipment, asbestos-containing building materials) and process equipment, removing them before initiation of decommissioning activities, and managing their treatment and disposal according to Sections 1.5 and 1.6 on Hazardous Materials and Hazardous Waste Management, respectively.
 - Assessing the presence of hazardous substances in or on building materials (e.g., polychlorinated biphenyls, asbestos-containing flooring, or insulation) and decontaminating or properly managing contaminated building materials.

- Preparing a plan to manage obsolete, abandoned, hazardous materials or oil consistently.

This document should be used with the relevant Industry Sector Guidelines, which guide users on EHS within the specific industry sector.

36. The Industry Guidelines are based on seven principal industry sectors, including infrastructure. The infrastructure sector, among other sub-sectors, comprises the water supply and sanitation, for which the World Bank has developed EHS recommendations. The [EHS Guidelines for Water and Sanitation](#) include information relevant to the operation and maintenance of potable water treatment and distribution systems. The document is intended to support developing and implementing risk management strategies that will ensure the environment's and society's safety through monitoring and control.
37. Following the requirements of ADB SPS, Uzsuvtaminot and QST JSC will apply pollution prevention and control technologies and practices consistent with international good practice as reflected in internationally recognized standards. General EHS Guidelines and EHS Guidelines for Water and Sanitation will apply to this **Subproject #WU-CW-10**. When national regulations differ from these levels and measures, Uzsuvtaminot and QST JSC will achieve whichever is more stringent. If less stringent levels or measures are appropriate given specific project circumstances, Uzsuvtaminot and QST JSC will provide complete and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

2.3. National Environmental Regulatory Framework

2.3.1. Institutional and Regulatory Framework

38. The Constitution⁵ is the fundamental law of the Republic of Uzbekistan (2023). The national environmental and social policy of Uzbekistan is based on the provisions of the country's Constitution. The following articles of the Constitution specify public obligations toward environmental protection:
- Article 49 constitutes citizens' right to a safe environment and reliable information about its condition. The Government is obliged to conduct environmental monitoring and mitigation measures to improve and protect nature.
 - Article 61 requires citizens to protect the environment and constitutes that the government protects environmental heritage.
 - Article 62 requires citizens to take care of the environment.
 - Article 66 stipulates the owner's right to own, use, and dispose of the property. The owner must not cause damage to the environment or violate the rights and legitimate interests of other people, society, and the state.

⁵ Constitution of the Republic Uzbekistan: <https://lex.uz/docs/6451070>

- Article 68 states that lands, subsoil, flora and fauna, and other natural resources are protected by the state and considered national wealth.
39. These policies are headed by the President of the Republic of Uzbekistan and secure an efficient coordination of governmental authorities (Article 105). The President approves general, strategic, and specific regulations binding across Uzbekistan (Article 110). The specific regulatory documents relate, amongst other things, to implementing investment projects following loan agreements and other covenants (Article 109).
 40. The President is supported by a bicameral Supreme Assembly named “Oliy Majlis.” The latter has the legislature's responsibility and the power to shape laws. The Oliy Majlis comprises the Legislative Chamber and the Parliament. The Oliy Majlis defines national environmental and social policies, approves national environmental programs, develops and adopts environmental and social legislation, coordinates environmental compliance monitoring actions, determines the rates of environmental charges, establishes respective incentives, etc.
 41. The Cabinet of Ministers is the executive institution responsible for securing the efficient functioning of the national economy, social and community services, enforcement, and enacting national laws and regulations. It comprises the Prime Minister, Deputy Prime Ministers, Ministers, and the Government Executive of the Republic of Karakalpakstan (Article 114). The Cabinet of Ministers ensures the implementation of a state policy in environmental protection, biodiversity, conservation, combating climate change, epidemics, and pandemics, and mitigating their consequences.
 42. On the local level, the Councils of People’s Deputies, or “Kengash” (Article 120), represent local government authorities and are responsible for the design of social and economic development and social safety net programs (Article 122). The executive power in place is represented by governors (khokims) who address issues within their designated service territory and are responsible for legal, environmental, health and safety, and economic, social, and cultural development (Article 123).
 43. The environmental mandate of local government includes identification of environmental priorities for the respective territory; approval of local ecological programs; inventory and evaluation of natural resources; inventory of environmentally hazardous facilities; logistical support to environmental actions; environmental permitting; waste management; a collection of ecological charges; and environmental control (Law on Nature Protection, No.754-XII of 09.12.1992).
 44. The Ministry of Ecology, Environmental Protection, and Climate Change of Uzbekistan of the Republic of Uzbekistan is the environmental regulator. The ministry is responsible for developing and enforcing the national environmental and conservation policy, overseeing ecological compliance, and integrating environmental management across various national, provincial, and district economic sectors. The environmental regulator has provincial branches and agencies providing scientific and technical support. The Bukhara Province Department oversees the environmental compliance of all projects in their designated area.

45. There are some other government institutions with responsibilities related to environmental protection and control, including the Ministry of Agriculture, the Ministry of Water Resources, Surveys, Cartography and the State Cadaster, the State Committee for Geology and Mineral Resources, the Centre of Hydro-meteorological Service, the Ministry of Health, the Ministry of Housing and Utility Services, etc. Their responsibilities include facilitation in setting up and maintaining a robust system of state environmental control and monitoring the development and implementation of environmental programs, strategies, and action plans to address conservation and sustainability issues.

2.3.2. Screening and Categorization

46. According to Uzbek legislations, all projects shall be screened and categorized at the earliest preparation stage. This is undertaken to:

- Define the potential impacts or risks that a project might present
- Determine the category for the proposed project
- Identify the required level of environmental assessment
- Determine disclosure requirements.

Uzbekistan's [Law No.1036](#), "On Ecological Expertise, Environmental Impact Assessment, and Strategic Environmental Assessment," was adopted on February 24, 2025. This law will replace the 2000 law and aim to strengthen environmental protection by defining key terms, establishing environmental regulations, and categorizing objects that are subject to EIA. However, [Law No.1036](#) has not been effective yet.

47. A project is classified depending on the project scale and scope of its main components and the significance of the potential environmental impacts. Projects are screened for their expected environmental impacts and assigned to one of the following four categories specified in [Regulation No.541](#):

- Category I – projects with high risks
- Category II – projects with moderate risks
- Category III – projects with low risks and
- Category IV – projects with local impact.

48. Subproject #WU-CW-10: NRW Equipment and OCS comprises two main components:

- Rehabilitation of the existing dispatcher station building
- SCADA development, installation, and commissioning.

The project design foresees repairing the two-story administrative building and procuring and installing a supervisory control and data acquisition system (SCADA). According to [Regulation No.541](#), the repair of administrative buildings is classified as Category IV and requires a rapid environmental assessment (REA). The REA report is to be submitted to the MEEPCC for review.

2.3.3. National Environmental Impact Assessment Procedure

Regulation Requirements

49. National Environmental Impact Assessment (EIA) is regulated by [Regulation No.541](#), where:
- Projects of Categories I and II are examined by the Center for Environmental Expertise (CEE) under MEEPCC. The projects of Categories III and IV are subject to evaluation by the CEE territorial departments.
 - Applicants shall submit project-related documents and EIA reports to the regulator's evaluation via www.eco-service.uz.
 - Submitted project documents are evaluated as follows:
 - Project of Category I is evaluated up to 20 calendar days
 - Project of Category II is evaluated up to 15 calendar days
 - Project of Category III is evaluated up to 10 calendar days
 - Project of Category IV is evaluated for up to 5 calendar days.
 - Regulator's project evaluation for environmental impacts is a mandatory and commercial service paid for by the applicant. The evaluation period starts from the date of payment.
 - Controversial issues regarding evaluating the project environmental impact assessment between the regulator and the applicant are considered by the specially established expert council within 15 working days of filing the complaint.
50. The regulator evaluates the project regarding the nature and extent of all predicted environmental impacts, residual environmental, economic, and social impacts, social benefits, alternatives, and relevance and feasibility of the proposed mitigation measures and sustainable use of natural resources, etc.
51. The evaluation procedure for the EIA project is implemented in the following three stages:
- **Submission of Project EIA with Application**
The project documents and EIA report shall be submitted for the regulator's evaluation during the project preparation, planning, and feasibility study. If the project belongs to Categories I or II, the evaluating project documentation shall also include meeting minutes of the public consultations conducted in the prescribed way.
 - **Statement of Environmental Impacts**
If the project information provided with the Application is insufficient, the regulator might request additional surveys, including laboratory tests, measurements, and a scientifically feasible environmental management plan. This supplemented information shall be submitted for the regulator's review before the start of the construction.
 - **Statement on Environmental Consequences**

In this final stage of the project evaluation, the regulator agrees upon the modifications to the project design, environmental standards for pollutant emission, and other engineering and operating documents related to the project.

52. The regulator's approval of the project EIA is valid for three years and can be extended for two more years. However, (a) if the project design changes, the applicant shall re-submit the project design documents and the EIA report for the regulator's evaluation, and (b) If the project has not started within the approved period, the regulator, considering the nature of the design changes, deserves the right to (i) request the applicant to renew the project documents or (ii) extend its approval for the project upon considering the provided information.

Project EIA

53. Following Appendix 1 of [Regulation No.541](#), Subproject #WU-CW-10 belongs to Category IV. Therefore, a rapid environmental impact assessment by national standards is required and is subject to evaluation by the Karakalpak Republican CEE under MEEPCC.
54. The water utility obtained the CEE's approval for the original project design on 10.08.2018, which was valid for three years, i.e., until 10.08.2021. In August 2021, at the request of QST LLC, the CEE extended its approval of the project design until 12.11.2023. The extension was granted based on Article 53 to Appendix 2 of Regulation No.541, allowing for an additional two-year approval extension.
55. After the expiration of the last approval, the CEE required a new environmental assessment for each subproject. Uzsuvtaminot signed an amendment to the contract with the Detailed Design Consultant (K-Water with Hankook Engineering and Global Business Services Consortium) to prepare an EIA for each civil work subproject. As of December 2023, construction was planned for only nine subprojects:
- Subproject #WU-CW-01: Water Supply Improvement in Amudarya District
 - Subproject #WU-CW-02: Water Supply Improvement in Beruni District
 - Subproject #WU-CW-03: Water Supply Improvement in Nukus District
 - Subproject #WU-CW-04: Water Supply Improvement in Karauzyak District
 - Subproject #WU-CW-05: Water Supply Improvement in Kungrad District
 - Subproject #WU-CW-06: Water Supply Improvement in Muynak District
 - Subproject #WU-CW-07: Construction of Mangit WTP
 - Subproject #WU-CW-08: Rehabilitation of Tuyamuyun PS
 - Subproject #WU-CW-09: Extension of Takhiatash WTP.
56. Nine EIAs were prepared and cleared by the CEE in 2024, making the nine subprojects valid for an additional three years (Table 1).

Table 1: CEE's Approval of the Nine Subprojects

Subproject #	CEE's Approval		
	Granted Date	Validity Period	Ending Date
WU-CW-01	23.07.2024	three years	23.07.2027

Subproject #	CEE's Approval		
	Granted Date	Validity Period	Ending Date
WU-CW-02	12.08.2024	three years	12.08.2027
WU-CW-03	08.05.2024	three years	08.05.2027
WU-CW-04	17.04.2024	three years	17.04.2027
WU-CW-05	09.08.2024	three years	09.08.2027
WU-CW-06	21.06.2024	three years	21.06.2027
WU-CW-07	01.04.2024	three years	01.04.2027
WU-CW-08	10.05.2024	three years	10.05.2027
WU-CW-09	20.06.2024	three years	20.06.2027

CEE = Center for Environmental Expertise under the Ministry of Ecology, Environmental Protection, and Climate Change of the Republic of Karakalpakstan

57. No civil work was designed for Subproject #WU-CW-10: NRW Equipment and OCS. According to the applicable national legislation, purchasing and installing computers and office equipment does not require an impact assessment. Therefore, no EIA was required for Subproject #WU-CW-10: NRW Equipment and OCS.
58. The design change for Subproject #WU-CW-10 was initiated in December 2024 at the request of the water utility to include the repair of the building designated for the installation of the SCADA system within the scope of Subproject #WU-CW-10. Due to the change in the subproject design, REA should be prepared prior to starting any physical work on the subproject and should be submitted to the CEE via the government electronic platform www.eco-service.uz. Approval of the subproject and its REA are required by the CEE following Article 4b to [Regulation No.541](#) before any civil work on the subproject.

2.4. Comparison of National and International EHS Standards

59. The ADB SPS and ESF require the project to implement pollution control methods that align with international best practices. When national standards differ from international standards, these policies mandate that the borrower comply with the more stringent requirements for the project. The sections below discuss EHS standards and compare them with good international practices and applicable national regulations.

2.4.1. Air Quality Standards

60. The national standard for ambient air quality monitoring is Public Health Regulation No. 0293-11⁶, Hygienic Standard: List of Pollutants and Maximum Allowable Concentrations in Ambient Air of Populated Areas in Uzbekistan.
61. The relevant international ambient air quality monitoring standard is the World Health Organization's (WHO) Global Air Quality Guidelines. It guides thresholds and limits for key

⁶ <https://lex.uz/docs/6950581>

air pollutants that constitute health risks. The guidelines also specify temporary targets that promote the gradual shift from higher levels to lower ones and recommend controlling the following components of the ambient air: particulate matter (PM_{2.5} and PM₁₀), nitrogen dioxide, sulfur dioxide, and carbon monoxide⁷.

62. The table below compares the relevant national and international standards and specifies the standard for air quality monitoring on the project.

Table 2: Ambient Air Quality Standards

Indicator	National standards	International standard		Applicable standard
SO ₂	0.05 mg/m ³ (annual mean) 0.2 mg/m ³ (24-hour mean)	40 µg/m ³ (24-hour mean)	WHO Global Air Quality Guidelines	0.04 mg/m ³ (24-hour mean) (WHO Global Air Quality Guidelines)
NO ₂	0.04 mg/m ³ (annual mean) 0.06 mg/m ³ (24-hour mean)	10 µg/m ³ (annual mean) 25 µg/m ³ (24-hour mean)	WHO Global Air Quality Guidelines	0.025 mg/m ³ (24-hour mean) (WHO Global Air Quality Guidelines)
CO	5.0 mg/m ³	4.0 mg/m ³	WHO Global Air Quality Guidelines	4.0 mg/m ³ (WHO Global Air Quality Guidelines)
PM 2.5	0.035 mg/m ³ (annual mean) 0.06 mg/m ³ (24-hour mean)	5 µg/m ³ (annual mean) 15 µg/m ³ (24-hour mean)	WHO Global Air Quality Guidelines	0.015 mg/m ³ (24-hour mean) (WHO Global Air Quality Guidelines)
PM 10	0.05 mg/m ³ (annual mean) 0.3 mg/m ³ (24-hour mean)	15 µg/m ³ (annual mean) 45 µg/m ³ (24-hour mean)	WHO Global Air Quality Guidelines	0.045 mg/m ³ (24-hour mean) (WHO Global Air Quality Guidelines)

WHO = World Health Organisation; PM = particulate matter; µg = microgram; m = meter; mg = milligram; SO₂ = sulfur dioxide; NO₂ = nitrogen dioxide; CO = carbon monoxide

63. Indoor air quality is regulated by the following national and international standards:
- Uzbekistan [Public Health Standard No. 0294-11](#), Hygienic standards for maximum permissible concentrations (MPC) of harmful substances in the air of the workplace.
 - [WHO Guidelines for Indoor Air Quality](#) for selected pollutants
 - [US EPA Workplace Guidelines](#)
 - [The National Institute for Occupational Safety and Health, Guidelines](#) – Appendix C – Supplementary Exposure Limits
 - [OSHA Permissible Exposure Limits](#) – Annotated Tables
64. To compare the values of the standards, the Uzbekistan Public Health Standard No. 0294-11 and the WHO Guidelines for Indoor Air Quality were used as the primary references. In instances where the WHO Guidelines did not provide specific values for a particular substance, other international standards referenced in the WHO guidelines were considered in the comparative chart below.

⁷ [WHO Global Air Quality Guidelines](#)

Table 3: Indoor Air Quality Standards

Indicator	Uzbek Public Health Standard No. 0294-11	International standard	Applicable standard
Benzene (C ₆ H ₆)	5 mg/m ³	5-20 µg/m ³ (WHO Guidelines for Indoor Air Quality)	no more than 20 µg/m ³ (WHO Guidelines for Indoor Air Quality)
Carbon monoxide (CO)	20 mg/m ³	10 mg/m ³ (8 hours) (WHO Guidelines for Indoor Air Quality)	no more than 10 mg/m ³ (8 hours) (WHO Guidelines for Indoor Air Quality)
Formaldehyde (CH ₂ O)	0.05 mg/m ³	0.1 mg/m ³ (30-minute) (WHO Guidelines for Indoor Air Quality)	no more than 0.05 mg/m ³ (Public Health Standard No. 0294-11)
Naphthalene (C ₁₀ H ₈)	20 mg/m ³	0.01 mg/m ³ (WHO Guidelines for Indoor Air Quality)	no more than 0.01 mg/m ³ (WHO Guidelines for Indoor Air Quality)
Nitrogen dioxide (NO ₂)	2 mg/m ³	200 µg/m ³ (1-hour average) (WHO Guidelines for Indoor Air Quality)	no more than 200 µg/m ³ (1-hour average exposure) (WHO Guidelines for Indoor Air Quality)
Polycyclic aromatic hydrocarbons (PAHs), specifically benzo[a]pyrene (C ₂₀ H ₁₂)	0.00015 mg/m ³ or 0.15 µg/m ³	0.2 mg/m ³ (OSHA Permissible Exposure Limits)	0.15 µg/m ³ (Public Health Standard No. 0294-11)
Trichloroethylene – TCE (C ₂ HCl ₃)	10 mg/m ³	8.8 µg/m ³ (US EPA Workplace Guidelines)	no more than 8.8 µg/m ³ (US EPA Workplace Guidelines)
Tetrachloroethylene (C ₂ Cl ₄)	30–10 mg/m ³	0.25 mg/m ³ (WHO Guidelines for Indoor Air Quality)	no more than 0.25 mg/m ³ (WHO Guidelines for Indoor Air Quality)

WHO = World Health Organisation; US EPA = United States Environmental Protection Agency; OSHA = United States Occupational Safety and Health Administration; µg = microgram; m = meter; mg = milligram

2.4.2. Noise and Vibration Standards

65. In Uzbekistan, noise and vibration are regulated by the following regulations:

- Public Health Regulation № 0325-16⁸, Sanitary Standards for Acceptable Noise Levels at the Workplace, 01.02.2016
- Public Health Regulation No. 0267-09⁹ Sanitary Standards on Permissible Noise in Residential, Public Buildings, and Surrounding Areas, 19.06.2009.

66. The corresponding international standards for noise and vibration monitoring include the following:

- WHO Guidelines for Community Noise¹⁰: The regulation provides the guideline values for specific environments.

⁸ https://nrm.uz/contentauth?link=7938b262d1e890b6eefb4833689a81b8&products=7_proverki_ot_a_do_ya

⁹ <https://lex.uz/docs/1765725>

¹⁰ Guidelines for Community Noise, April 1999, WHO, <https://apps.who.int/iris/handle/10665/66217>

- International Labour Organization Standard (ILO): Regulation “Protection of workers against noise and vibration in the working environment¹¹,” among other terms, provides limits for noise and vibration levels.

67. The table below compares relevant national and international standards and specifies the standard for noise and vibration monitoring on the project.

Table 4: Noise and Vibration Standards

Indicator	National standards		International standard		Applicable standard
Outdoor living area	55 dB (7 am – 11 pm) 45 dB (11 pm – 7 am)	Public Health Regulation No. 0008-20, Sanitary standards on the permissible noise level in residential and public buildings, residential and recreation areas	55 dB (daytime) 45 (nighttime)	WHO Guidelines for Community Noise	55 dB (7 am – 11 pm) 45 dB (11 pm – 7 am) Public Health Regulation No. 0008-20
Schools	40 dB (during class) 55 dB (for outdoor playgrounds)	Public Health Regulation No. 0008-20	35 dB (during class) 55 dB (for outdoor playgrounds)	WHO Guidelines for Community Noise	35 dB (during class) 55 dB (for outdoor playgrounds) WHO Guidelines for Community Noise
Hospitals	35 dB (7.00 am – 11 pm) 25 dB (11 pm – 7 am)	Public Health Regulation No. 0008-20	30 dB (daytime and evenings)	WHO Guidelines for Community Noise	30 dB (daytime and evenings) WHO Guidelines for Community Noise
Industrial, commercial shopping, and traffic areas, indoors and outdoors	60 dB	Public Health Regulation No. 0008-20	70 dB (24h)	WHO Guidelines for Community Noise	60 dB (24 hours) Public Health Regulation No. 0008-20
Noise level at the working places	91 dB – 95 dB (during work with noisy equipment)	Public Health Regulation № 0325-16, Sanitary standards for acceptable noise levels at workplace	85 dB (daytime)	ILO Standard: Protection of workers against noise and vibration in the working environment	85 dB ILO Standard: Protection of workers against noise and vibration in the working environment

WHO = World Health Organisation; ILO = International Labour Organization Standard; dB = decibel

68. International relevant standards and guidelines for vibration monitoring include the following:

- ISO 2631-1: Provides guidance on human response to vibration in buildings.
- ISO 4866:2010: Covers the measurement and evaluation of structural vibration.

¹¹ Protection of workers against noise and vibration in the working environment, ILO, Switzerland, 1984, ISBN 92-2-101709-5, third edition, https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/normativeinstrument/wcms_107878.pdf

- BS 5228-2:2009: A code of practice for noise and vibration control on construction and open sites.
- BS 6472: Provides detailed guidance on human response to vibration in buildings.
- DIN 4150-3: Standard for protecting the integrity of sensitive structures.
- USBM RI 8507: Safe blasting levels.

Following these standards, humans are quite sensitive to vibrations, with the perception threshold typically lying between 0.14 mm/s and 0.3 mm/s (0.0055 and 0.0118 in/s) peak particle velocity (PPV). Vibrations exceeding these levels can cause disturbances, startle people, lead to annoyance, or disrupt work. At elevated levels, vibrations may be deemed unpleasant or even painful.

Following ISO 2631-1, the vibration peak acceleration of 0.015 m/s² is an acceptable vibration level for building occupants. If the floor vibrations are only slightly above this level, then building occupants are likely to complain. In practice, the building users' perceptible vibration ranges from 0.01 m/s² to 0.02 m/s² peak.

The German DIN 4150-2 standard sets the limit for human beings at 0.1 KB, where 1 KB is referenced as 1 mm/s of a weighted RMS of perceptible vibration velocity. Other German standard DIN 4150-3 defines the values which must be met to avoid damage and impact on structures:

- from 20 mm/s up to 50 mm/s – for buildings used for commercial and industrial buildings
- from 4 mm/s up to 20 mm/s for residential buildings
- from 3 mm/s up to 10 mm/s for building sensitive to vibration that has great intrinsic value.

The British standard, BS 5228-2 specifies two tables outlining specific limits – one for human perception (Table 5) and another for structural damage (Table 6).

Table 5: BS-5228-2, Guidance on the Effects of Vibration Levels on Human

Vibration Level	Effect
0.14 mm/s ⁻¹	Vibration might be just perceptible in the most sensitive situations for most frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 mm/s ⁻¹	Vibration might be just perceptible in residential environments.
1.0 mm/s ⁻¹	It is likely that vibration of this level in residential areas will cause complaint but can be tolerated if prior warning and explanation have been given to residents.
10 mm/s ⁻¹	Vibration is likely to be intolerable for any more than a very brief exposure to this level.

Table 6: Guidance on the Effects of Vibration Levels on Structures

Line	Type of building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
1	Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	50 mm/s at 4 Hz and above

2	Unreinforced or light framed structures Residential or light commercial buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above
Note 1 Values referred to are at the base of the building. Note 2 For line 2, at frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.			

69. Below are some common sources of vibration activity.
- **Blasting:** This ground-borne vibration type, with frequencies of 1-300 Hz and PPV up to 50 mm/s (2 in/s), can significantly impact structures, especially those resonating at frequencies of 6-10 Hz. Additionally, the air overpressure from explosions, with frequencies as low as 40 Hz, can damage building windows and facades.
 - **Pile Driving:** Caused by pile driving operations, these vibrations have frequencies of 1 to 100 Hz and PPV values reaching 100 mm/s (4 in/s). They pose particular danger at low frequencies around 20 Hz, threatening the integrity of nearby structures.
 - **Concrete Crunchers and Rock Machinery:** Operating at lower frequencies, concrete crunchers work around 3 Hz, while rock machinery causes ground vibrations of 1-100 Hz and PPV up to 100 mm/s (2 in/s). This equipment can impact both the construction site and adjacent areas.
 - **Construction Work Inside Buildings:** Internal building activities can produce vibrations of 1-300 Hz with PPV up to 30 mm/s (1.2 in/s), posing risks to the building and its immediate environment.
 - **Heavy Trucks:** The transit of heavy trucks to and from the construction site generates low-frequency vibrations (1-100 Hz) with PPV potentially reaching 50 mm/s (2 in/s). These vibrations are of particular concern for roads, infrastructure, and buildings in proximity.
70. Vibration levels and their impact on humans and public structures in Uzbekistan are regulated by the following public health and building standards:
- [Public Health Standard No.0326-16: Sanitary Standards for General and Local Vibration in Workplaces](#)
 - [Building Code: Public Buildings and Facilities](#)
71. Uzbek regulation classifies vibration effects into three categories based on their location:
- (a) Vibration effects that occur at permanent workplaces within industrial premises.
 - (b) Vibration effects occurring in areas such as warehouses, canteens, utility rooms, duty rooms, and other production spaces without machinery generating vibrations.
 - (c) Vibration effects that take place in workplaces located in management buildings, design offices, laboratories, training centers, computing centers, health centers, office spaces, workrooms, etc.
72. Accordingly, vibration permissible limits are also provided for each of the indicated categories. However, since the project facility pertains to office buildings, the standards for category (c) are detailed in [Table 7](#) (Table 7 of Public Health Standard No.0326-16).

Table 7: Vibration Permissible Limits

Frequency Range, Hz	Permissible limits for vibration velocity and acceleration on Z,X,Y-directions			
	vibration acceleration		vibration velocity	
	m/s ²	dB	m/sx10 ⁻²	dB
2.0	0.02	36	0.18	91
4.0	0.014	33	0.063	82
8.0	0.014	33	0.032	76
16.0	0.028	39	0.028	75
31.5	0.056	45	0.028	75
63.0	0.112	51	0.028	75
Corrected average and equivalent values	0.014	33	0.028	75

73. Comparing national and international regulations, it was determined that national vibration standards should be applied for the project, specifying a vibration velocity of 0.028 m/s², equivalent to 75 dB, at a frequency of 63 Hz.

2.4.3. Drinking Water Quality Standards

74. The key Uzbek regulations in the drinking water quality control are the following:
- Uzbekistan Standard for Drinking Water No. O'zMSt 133:2024, 09.06.2024: Hygienic Requirements and Water Quality Control
 - Public Health Regulation No. 0211-06.¹², Hygienic Requirements and Water Quality Control in Water Supply Systems of Uzbekistan.
75. The corresponding international standards for drinking water quality include the following:
- The WHO's Guidelines for Drinking-water Quality.¹³ (the regulation requires instrumental monitoring of water microbiology and chemistry).
 - EU Council Directive 98/83/EC on the quality of water intended for human consumption.¹⁴ (the regulation requires conducting drinking water monitoring on microbiological and chemical parameters, including pesticides).
76. The table below lists the indicators that Uzbek water utilities routinely use to monitor drinking water quality. The table also compares relevant national and international standards and specifies the standard for drinking water monitoring during the project.

¹² Hygienic Criteria for Centralized Drinking Water Quality Monitoring in Uzbekistan No. 0211-06, <https://lex.uz/ru/docs/1934624>

¹³ Guidelines for Drinking-water Quality: fourth edition incorporating the first addendum, ISBN 978-92-4-154995-0, World Health Organization 2017, <https://apps.who.int/iris/bitstream/handle/10665/254637/9789241549950-eng.pdf>

¹⁴ Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31998L0083&from=EN>

Table 8: Drinking Water Standards

Indicator	National standards	WHO Guidelines for Drinking Water Quality	EU Council Directive 98/83/EC on the Quality of Water Intended for Human Consumption	Applicable standard
Odour at 20 and 60 °C	2 units	Water should be free of tastes and odors that would be objectionable to most consumers	Acceptable to consumers and no abnormal change	no odor (WHO Guidelines for Drinking Water Quality)
Taste	2 units	Water should be free of tastes and odors that would be objectionable to most consumers	Acceptable to consumers and no abnormal change	no taste (WHO Guidelines for Drinking Water Quality)
Colour	20/25 TCU. ¹⁵	Drinking water should ideally have no visible colour	Acceptable to consumers and no abnormal change	no colour (WHO Guidelines for Drinking Water Quality)
Turbidity	1.5/2.0 mg/l (mg/dm ³)	none to exceed 1 NTU. ¹⁶	Acceptable to consumers and no abnormal change	none exceed 1 NTU (WHO Guidelines for Drinking Water Quality)
pH	6.0-9.0	6.5 – 8.5	≥6.5 and ≤ 9.5	6.5 ÷ 8.5 (WHO Guidelines for Drinking Water Quality)
Total hardness Σ(Ca+Mg)	7.0 (10.0) mg-eq./l (mg-eq/dm ³)	---	---	7.0 mg-eq/l (Uzbek Standard for Drinking Water No. O'zMSt 133:2024 "Hygienic Requirements and Quality Control")
Alkalinity (HCO ₃)	3.0 mg-eq./l (mg-eq/dm ³)	---	---	3.0 mg-eq/l (Uzbek Standard for Drinking Water No. O'zMSt 133:2024 "Hygienic Requirements and Quality Control")
Chlorides	250 (350) mg/l (mg/dm ³)	200 ÷ 300 mg/l	250 mg/l	250 mg/l (EU Council Directive 98/83/EC on the Quality of Water Intended for Human Consumption)
Oxygen demand	5.0 mg/l (mg/dm ³)	---	---	5.0 mg/l (Uzbekistan Standard for Drinking Water No. O'zMSt 133:2024)
Sulfates	400 (500) mg/l (mg/dm ³)	---	250 mg/l	250 mg/l (EU Council Directive 98/83/EC on the Quality of Water Intended for Human Consumption)
Iron	0.3 mg/l (mg/dm ³)	below 0.3 mg/l	200 µg/l = 0.2 mg/l	0.2 mg/l (EU Council Directive 98/83/EC on the Quality of Water Intended for Human Consumption)
Copper	1.0 mg/l (mg/dm ³)	2 mg/l	2 mg/l	1.0 mg/l (Uzbekistan Standard for

¹⁵ The color of the water is measured in true color units (TCU).¹⁶ The water turbidity is measured in nephelometric turbidity units (NTU).

Indicator	National standards	WHO Guidelines for Drinking Water Quality	EU Council Directive 98/83/EC on the Quality of Water Intended for Human Consumption	Applicable standard
				Drinking Water No. O'zMSt 133:2024)
Fluoride	0.7 mg/l (mg/dm ³)	between 0.5 and 1 mg/l	1.5 mg/l	0.7 mg/l (Uzbekistan Standard for Drinking Water No. O'zMSt 133:2024)
TDS	1,000 (1,500) mg/l (mg/dm ³)	600 ÷ 1,000 mg/l	500–15,000 mg/l	600 – 1,000 mg/l (WHO Guidelines for Drinking Water Quality)
Nitrites	3 mg/dm ³ (mg/l)	3 mg/l	0.5 mg/l	0.5 (EU Council Directive 98/83/EC on the Quality of Water Intended for Human Consumption)
Nitrates	45 mg/dm ³ (mg/l)	50 mg/l	50 mg/l	45 mg/dm ³ (mg/l) (Uzbekistan Standard for Drinking Water No. O'zMSt 133:2024)
Ammonia	2 mg/dm ³ (mg/l)	0.2 mg/l	---	0.2 (WHO Guidelines for Drinking Water Quality)
Total coliforms	Not more than 3 per 1000 ml (dm ³)	Escherichia coli provides conclusive evidence of recent fecal pollution and should not be present in drinking water. Must not be detectable in any 100 ml sample	Escherichia coli (E. coli): 0	zero coliforms (WHO Guidelines for Drinking Water Quality)

TDS = total dissolved solids; NTU = Nephelometric Turbidity Units; mg = milligram; dm = decimeter; l = liter; ml = milliliter; eq. = equivalent; WHO = World Health Organisation; EU = European Union; EC = European Commission; Ca = Calcium; Mg = Magnesium; HCO₃⁻ = bicarbonate ion

2.4.4. Surface Water Quality Standards

77. Table 2 of Public Health Regulation No. O'zDSt 951:2011.¹⁷–Water Sources for Drinking and Domestic Use – Hygienic and Technical Requirements and Rules specifies ten indicators that surface water sources must meet if used for drinking and domestic purposes. Under this national standard, surface water sources used for drinking water fall into three categories depending on quality and composition.

Table 9: Uzbek Surface Water Quality Standard

No.	Indicator	Standard requirements by category		
		Category 1	Category 2	Category 3
1.	Turbidity, mg/dm ³	20	1,500	10,000
2.	Color, units	30	50	100
3.	Odor, units	2	3	4
4.	Iron (Fe), mg/dm ³	0.3	1.0	3.0

¹⁷ <https://www.lex.uz/docs/4979421>

No.	Indicator	Standard requirements by category		
		Category 1	Category 2	Category 3
5.	Manganese (Mn), mg/dm ³	0.1	1.0	2.0
6.	Fluorine (F), mg/dm ³	0.7	0.7	0.7
7.	Permanganate index (PMI)	7.0	15.0	20.0
8.	Coliform bacteria count per 1 dm ³	1,000	10,000	50,000
9.	pH	6.5-8.5	6.5-8.5	6.5-8.5
10.	BOD, mg/dm ³	3.0	5	7

BOD = Biochemical Oxygen Demand; PMI = permanganate index; Mn = Manganese; Fe = Iron

78. The relevant international standard is [EU Council Directive 98/83/EC on the quality of water intended for human consumption](#). This regulation does not classify water sources for categories but requires more detailed microbiological tests of water ([Figure 1](#)).

ANNEX I
PARAMETERS AND PARAMETRIC VALUES
PART A
MICROBIOLOGICAL PARAMETERS

Parameter	Parametric value(number/100 ml)
<i>Escherichia coli</i> (E. coli)	0
Enterococci	0

The following applies to water offered for sale in bottles or containers.

Parameter	Parametric value
<i>Escherichia coli</i> (E. coli)	0/250 ml
Enterococci	0/250 ml
<i>Pseudomonas aeruginosa</i>	0/250 ml
Colony count 22 °C	100/ml
Colony count 37 °C	20/ml

Figure 1: Water Microbiological Parameters

(Source: Excerpt of EU Council Directive 98/83/EC, <https://www.legislation.gov.uk/eudr/1998/83/annex/I/>)

2.4.5. Ground Water Quality Standards

79. Table 1 of Public Health Regulation No. O'zDSt 951:2011.¹⁸ – Water Sources for Drinking and Domestic Use – Hygienic and Technical Requirements and Rules specifies nine indicators that groundwater sources must meet if used for drinking and domestic purposes. Under this national standard, groundwater sources used for drinking water fall into three categories depending on quality and composition, as specified in Table 5.

Table 10: Uzbek Groundwater Quality Standard

Indicator	Standard requirements by category		
	Category 1	Category 2	Category 3
Turbidity, mg/dm ³	1.5	1.5	10.0

¹⁸ <https://www.lex.uz/docs/4979421>

Indicator	Standard requirements by category		
	Category 1	Category 2	Category 3
Color	20	20	30
pH (Hydrogen ion concentration)	6-9	6-9	6-9
Iron (Fe), mg/dm ³	0.3	5.0	10.0
Manganese (Mn), mg/dm ³	0.1	1.0	2.0
Hydrogen sulfide (H ₂ S), mg/dm ³	-	-	3.0
Fluorine (F), mg/dm ³	0.7	0.7	0.7
Permanganate index (PMI)	2.0	5.0	10.0
Coliform bacteria count per 1 dm ³	3	100	1000

BOD = Biochemical Oxygen Demand; PMI = permanganate index; CGB = Coliform Group Bacteria

80. The WHO has guidelines for drinking water quality that can be used to assess groundwater quality for drinking. WHO Guidelines for Drinking Water Quality were discussed in [Section 2.4.3](#).

2.4.6. Soil Quality Standards

81. Public Health Regulation № 0183-05.¹⁹, "Hygienic Requirements for Soil Quality in Populated Areas with the Specific Natural Climatic Conditions of Uzbekistan" and [Public Health Regulation № 0191-05](#), "Maximum Permissible Concentrations and Approximate Permissible Concentrations of Exogenous Harmful Substances in Soil", stipulate requirements for the soil quality. The corresponding international standards for soil quality monitoring include the following:
- The Food and Agriculture Organization (FAO) [Global Soil Partnership](#): Standard Operating Procedures.²⁰ (provides methods for soil monitoring)
 - WHO Permissible Limits for Heavy Metals in Plants and Soil (WHO, 1996)²¹ (specifies maximum levels of chemicals in soil)
 - EU Directive 86/278/EEC²² – On the protection of the environment, particularly in the soil, when sewage sludge is used in agriculture (1986).
82. The table below compares the relevant national and international standards and specifies the standard for soil quality monitoring on the project.

Table 11: Soil Quality Standards

Indicator	National Standards	FAO Global Soil Partnership	WHO	EU Council Directive	Applicable Standard
pH	6-9	6.0 – 7.5	---	---	6.0 – 7.5 (Global Soil Partnership)
Cu	3 mg/kg	---	36 mg/kg	50 to 140 mg/kg	3 mg/kg (Public Health Regulation № 0191-05)
Pb	32 mg/kg	---	85 mg/kg	50 to 300 mg/kg	32 mg/kg

¹⁹ <https://lex.uz/ru/docs/1922643>

²⁰ <https://www.fao.org/3/ca2796en/CA2796EN.pdf>

²¹ <https://www.omicsonline.org/articles-images/2161-0525-5-334-t011.html>

²² <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31986L0278>

Indicator	National Standards	FAO Global Soil Partnership	WHO	EU Council Directive	Applicable Standard
					(Public Health Regulation № 0191-05)
Zinc	23 mg/kg	---	50 mg/kg	150 to 300 mg/kg	23 mg/kg (Public Health Regulation № 0191-05)
NO ₃	130 mg/kg	---	---	---	130 mg/kg (Public Health Regulation № 0191-05)

Cu = copper; Pb = lead; Zn = zinc; NO₃ = nitrate; mg = milligram; kg = kilogram; WHO = World Health Organization; FAO = Food and Agriculture Organization

2.4.7. Waste Management

Solid waste management

83. The Law on Waste No.362-II²³ of April 5, 2002, regulates solid waste management in Uzbekistan. It requires legal and individual entities to contract a solid waste management operator to collect and dispose of waste. The legal customers are served by the Bukhara Province Solid Waste Management Company – “Toza Hudud”²⁴, or its district branches.
84. Municipal solid waste generated during the construction and operation phase will be managed according to Law on Waste No.362-II (Section 2.1.9), which requires contractual arrangements for the collection, transportation, and disposal of waste by the operator.
85. Another relevant document regulating solid waste management is Public Health Standard No.0297-11²⁵, Cleaning the Populated Areas from Solid Waste in Uzbekistan. Among other provisions, the regulation (Article 3.8) specifies supervision by the public health service over solid waste management during construction, including (a) verification of the performing works in compliance with design documents, (b) comparing sanitary conditions of the site(s) during construction with those at the land acquisition stage; (c) implementation progress of environmental management measures.
86. Public Health Standard No. 0068-96²⁶, Collection, Storage, Transportation, Disinfection, and Disposal of Solid Waste in the Cities of Uzbekistan, 04.11.1996, provides information on the average morphological composition of solid waste, norms of solid waste accumulation, and objectives of sanitary supervision over solid waste transportation and disposal from urban areas.

Hazardous waste management

²³ <https://lex.uz/docs/44872>

²⁴ https://www.uznature.uz/ru/region_organization?numer=1084

²⁵ <http://www.med.uz/download/files/sanpin/SanPiN-0297-11.pdf>

²⁶ <https://lex.uz/docs/1953516>

87. Public Health Standard No. 0158-04.²⁷, “Collection, Transportation, and Disposal of Asbestos-containing Waste in Uzbekistan”, 12.07.2004 stipulates the following key provisions:

- Following Public Health Standard No. 0128-02.²⁸, “Hygienic Classifier of Toxic Industrial Waste in Uzbekistan,” asbestos-containing waste is classified as Category 3 (moderately hazardous waste) and Category 4 (low-hazard waste).
- Category 3 includes asbestos, asbestos fabrics and fibers, gasket materials, and stuffing box bushings; Category 4 includes waste of paper, cardboard, and products made from them, roofing felt, and bitumen-impregnated paper, asbestos cement waste, crushed stone, pressed asbestos and rubber-asbestos products, mineral fibers, fabrics and yarn, asbestos grinding dust, rock dust with asbestos.
- Asbestos-containing waste is produced in industries where asbestos is used as a reinforcing material in the manufacture of asbestos-cement products, such as pipes, roofing sheets, and slabs. It is also used as a flame retardant in textiles and paper, as a friction material, as a filler in plastics, and in alkali-resistant materials and products. Additionally, asbestos serves as a filter material in the chemical, pharmaceutical, and food industries, as well as an insulating and dielectric material (Article 2.1).
- Enterprises maintain a register with data on the quantity, quality, and hazard classes of generated industrial waste following the Public Health Standard²⁹ 0127-02 “Sanitary Rules on Stocktaking, Classification, Storage and Disinfection of Industrial Waste” (Article 4.1).
- Small shavings and debris containing asbestos must be removed in ways that prevent dust formation. In the case of manual cleaning, personal protection equipment (respirators) must be used. When collecting bulk materials by other means, hazardous materials should be placed in impenetrable bags or containers. Changing and unloading containers should be done mechanically to avoid health risks (Article 4.3).
- Solid asbestos-containing waste should be stored in areas where it will not be subject to degradation while awaiting disposal. Bags (or other containers) containing loose asbestos fibers should be removed by crushing or packing them into dense transportable bales in a designated area. Reusing asbestos-free bags, wastepaper, or containers for any materials is prohibited (Article 4.4).
- Liquid asbestos-containing waste must be stored in special containers or settling tanks and periodically emptied (Article 4.5).
- All asbestos waste awaiting disposal, whether in containers, bags, or containers, must be appropriately labeled (Article 4.6).
- Workers must wear appropriate protective clothing and respirators when performing all activities and operations related to collecting and temporarily storing asbestos-containing waste (Article 4.8).

²⁷ <https://lex.uz/ru/docs/1912436>

²⁸ <http://med.uz/ses/surkhandarya/documents/detail.php?ID=47037>

²⁹ http://med.uz/ses/tashvil/documents/?SECTION_ID=141&PAGEN_5=25

- Loading, transportation, unloading, and disposal of asbestos-containing waste must be mechanized. Waste transportation must exclude its losses along the route. Transportation of unpackaged asbestos in open car bodies and on railway platforms is not allowed. In the event of waste spillage during transportation, corresponding measures must be immediately taken. If the volume is small, the waste must be collected in the original container; if it is large, it must be moistened and removed in compliance with the necessary precautions, including personal protective equipment (Article 5.2).
88. Uzbekistan does not have regulations prohibiting asbestos-containing materials (ACM) use in the construction of buildings and structures, except for Regulation No. 102³⁰, Approval of Common Technical Safety Procedure on Telecommunication Equipment, which serves as a ban on ACM use when laying telecommunication lines. However, international hazardous waste management standards require identifying ACMs and their subsequent careful removal and disposal. Since ADB funds the project, the project will prohibit the use of ACM following the [ADB Prohibited Investment Activities List](#)'s requirements, including excluding both bonded and unbonded asbestos. This means no ACM will be procured or used for the project implementation.
89. Several sections of [General Environmental, Health, and Safety Guidelines](#) (such as *1.5 Hazardous Materials Management*, *2.0 Occupational Health and Safety*, and *4.0 Construction and Decommissioning*) require avoiding using ACM in buildings as new material for remodeling or renovating activities. For the existing facility requiring renovation activities, the guidelines stipulate the development of an asbestos management plan that identifies the locations where the ACM is present, its condition (e.g., whether it is in friable form with the potential to release fibers), procedures for monitoring its condition, procedures to access the locations where ACM is present to avoid damage, and training of staff who can potentially come into contact with the material to avoid damage and prevent exposure. The plan should be made available to all people involved in operations and maintenance activities. Repair or removal and disposal of existing ACM in buildings should only be performed by specially trained personnel following the host country's requirements or, in their absence, internationally recognized procedures.
90. Management of hazardous waste during the project implementation will follow (1) Public Health Standard No. 0127-02 0127-02 – Sanitary Rules on Stocktaking, Classification, Storage and Disinfection of Industrial Waste (Section 2.1.9), requiring contractual arrangement for collection, transportation, and disposal of waste by operator and (2) General EHS Guidelines (*1.5 Hazardous Materials Management*³¹) recommended to avoid or, when avoidance is not feasible, minimize uncontrolled releases of hazardous materials or accidents (including explosion and fire) during their production, handling, storage, and use.

³⁰ <https://lex.uz/docs/3124839>

³¹ <https://www.ifc.org/content/dam/ifc/doc/2000/2007-general-ehs-guidelines-en.pdf>

2.4.8. Health and Safety Regulations

91. Occupational health and safety in Uzbekistan are regulated by applicable laws and by-laws, including the following:
- Labor Code³²
 - Law “On occupational health and safety”³³
 - Construction Standard No. KMK-3.01.02-00³⁴ “Occupational health and safety during contraction”
 - Regulation No. 272³⁵ “On the organization of occupational safety training”
 - Public Health Standard No. 0346-17³⁶ “Sanitary rules and regulations on labor and working conditions to be set at the enterprises”
 - Regulation of the Cabinet of Ministers No. 286³⁷ “On the investigation and recording of industrial accidents and other injuries to the health of workers related to the performance of their job duties”
 - Regulation No. 273³⁸ “On the organization of labor safety”
 - Regulation No. 870³⁹ “On the development of health and safety procedure”
 - Law No. ZRU-226⁴⁰ “On fire safety”
 - Construction Standard No. KMK 3.01.07-98⁴¹ “Fire safety rules during construction, reconstruction, expansion of buildings and structures, and their modernization”
 - Law on Workers’ Compensation Insurance⁴²
 - Regulation of the Cabinet of Ministers No. 532⁴³ “On compulsory insurance for construction at the expense of public funds and loans under government guarantee”
 - Law No. ZRU-155⁴⁴ “On mandatory vehicles owners’ insurance.”
92. The applicable regulatory framework provides for establishing an effective health and safety system at the construction site, including corresponding procedures, training, a communication system, and the provision of PPE for workers and site visitors.
93. IFC’s EHS Guidelines on Occupational Health and Safety will also be applied to the project activities and require contractors and PMC to act as construction supervision consultants to protect the health and safety of workers and other project personnel. Preventive and

³² <https://lex.uz/ru/docs/6257291>

³³ <https://lex.uz/acts/97258>

³⁴ <https://lex.uz/en/docs/4438824>

³⁵ <https://lex.uz/docs/699606>

³⁶ <https://ssv.uz/ru/documentation/sanpin-0346-17-sanitarnye-pravila-i-normy-dlja-predpriyatij-i-proizvodstv-negosudarstvennoj-formy-sobstvennosti-i-individualnoj-trudovoj-deyatelnosti>

³⁷ <https://lex.uz/docs/545122>

³⁸ <https://lex.uz/docs/700108>

³⁹ <https://lex.uz/docs/515009>

⁴⁰ <https://lex.uz/docs/1521663>

⁴¹ https://mc.uz/uploads/mcuz_165664024748.pdf

⁴² <https://lex.uz/acts/1471201>

⁴³ <https://lex.uz/docs/351510>

⁴⁴ <https://lex.uz/docs/1342476>

protective measures will be introduced starting from (i) eliminating the hazard, (ii) controlling the hazard at its source through the use of engineering controls, (iii) minimizing the hazard through the design of safe work systems and administrative or institutional control measures, to (iv) provision of personal protective equipment.

2.4.9. Other National Regulations

94. Other regulations include the following:

- Public Health Regulation No.0212-06, Sanitary Rules of Hygienic Assessment of Soil Pollution in Different Types of Land Use in Uzbekistan⁴⁵, 07.07.2006
- Building Standard KMK 2.04.02-2, Water supply. External networks and facilities,⁴⁶
- Public Health Standard No. 0244-07, Design and Operation of Sanitary Buffer Zones of Drinking Water Sources and Facilities⁴⁷, 29.12.2007
- Law on Environmental Control, No. 63, 27.12.2013
- Law on Environmental Audit, No. 678, 15.03.2021
- Law on Protection and Use of Flora, No. 409, 21.09.2016
- Law on Protection and Use of Fauna, No. 408, 19.09.2016
- Law on Protected Natural Territories, No. 13, 08.01.2018
- Law on Subsoil (new edition), No. 444-II, 13.12.2002
- Law on Water and Water Use, No. 837-XII, 06.05.1993
- Law on Industrial Safety of Hazardous Production Facilities, No. 57, 28.09.2006
- Law “On the Protection and Use of Cultural Heritage,”⁴⁸ No. 269-II, 30.08.2001.

3. PROJECT DESCRIPTION

3.1. Project Progress and Main Features

95. The Western Uzbekistan Water Supply System Development Project supports the government's ongoing efforts to improve water supply and sanitation services (WSS) in the Republic of Karakalpakstan. The project activities cover six districts of the Republic of Karakalpakstan such as Amudarya, Beruni, Nukus, Karauzyak, Kungrad, and Muynak districts.
96. The project activities address the existing issues within the drinking water in the project area by modernizing and extending the water supply infrastructure under the following subprojects:
- Subproject #WU-CW-01: Water Supply Improvement in Amudarya District
 - Subproject #WU-CW-02: Water Supply Improvement in Beruni District

⁴⁵ <https://lex.uz/docs/1932321?query=%D0%A1%D0%B0%D0%BD%D0%9F%D0%B8%D0%BD>

⁴⁶ <https://mc.uz/gradostroitelnye-normy/>

⁴⁷ <https://lex.uz/docs/1921690>

⁴⁸ <https://lex.uz/acts/10375>

- Subproject #WU-CW-03: Water Supply Improvement in Nukus District
- Subproject #WU-CW-04: Water Supply Improvement in Karauzyak District
- Subproject #WU-CW-05: Water Supply Improvement in Kungrad District
- Subproject #WU-CW-06: Water Supply Improvement in Muynak District
- Subproject #WU-CW-07: Construction of Mangit WTP
- Subproject #WU-CW-08: Rehabilitation of Tuyamuyun PS
- Subproject #WU-CW-09: Extension of Takhiatash WTP
- Subproject #WU-CW-10: NRW Equipment and OCS.

A brief scope of work is provided in [Appendix 2](#).

97. Additionally, the project includes initiatives for operation and maintenance (O&M) capacity development, corporate development, and GIS and hydraulic modeling activities. These initiatives are designed to enhance the water utility's overall operational performance.
98. The project is being implemented by QST LLC in collaboration with Uzsvtaminot, represented by the PCU and the Local Project Coordinator in the Republic of Karakalpakstan. QST LLC and Uzsvtaminot are jointly responsible for implementing the project following the terms agreed upon by the borrower and ADB. This collaboration adheres to the relevant policies and procedures set forth by the government and ADB.
99. The PCU is fully equipped with engineering personnel, administrative staff, an environmental specialist, and two social experts who are responsible for social safeguards and gender-related activities in the project.
100. The project feasibility study was approved in 2017, and the Project Engineer (Royal Dezain Loyiha LLC, Uzbekistan) and PMC (Consortium of K-Water, Hankook Engineering, and Global Business Services) were engaged on the project in 2022.
101. As of 01.03.2025, the Project has the following six civil works contractors on board:
 - (1) Contract for Subproject # WU-CW-01 was awarded to ArchiCO LLC (Azerbaijan) and signed on 03.07.2024.
 - (2) Contract for Subproject No. WU-CW-02 was awarded to "Mesmer East-Alkatas Insaat ve Taahhut As" JV (Uzbekistan and Turkey) and signed on 06.07.2024.
 - (3) Contract for Subproject No. WU-CW-03 was awarded to Azerbaijan Research and Production Association (Azerbaijan) and signed on 04.02.2023.
 - (4) Contract for Subproject No. WU-CW-04 was awarded to Azerbaijan Research and Production Association (Azerbaijan) and signed on 27.07.2023.
 - (5) Contract for Subproject No. WU-CW-06 was awarded to ArchiCO LLC (Azerbaijan) and signed on 04.09.2024.
 - (6) Contract for Subproject No. WU-CW-07 was awarded to "Obi Hayot Inginiring-Uy Jay Kurilish" JV (Uzbekistan) and signed on 05.06.2023.
102. Construction work is currently underway and is at various stages across six different contracts and covers activities in Amudarya, Beruni, Nukus, Karauzyak, and Muynak districts.

103. Contract for Subproject No. WU-CW-08 was awarded to Obi Hayot Inginiring (Uzbekistan) on 30.11.2020. The civil work under this contract has been completed, and the project facilities have been commissioned to the water utility. However, QST LLC has requested additional rehabilitation work on its main water intake system at the Tuyamuyun Water Intake. Although this extra work has been approved by the government, there is currently no funding available in the project budget to finance these activities. Negotiations on additional financing for these works have now resumed between the ADB and the government. If the ADB and relevant government authorities officially approve the project design change, then the IEE for this subproject should be updated correspondingly.
104. International competitive bidding is in progress for procuring civil work under Subproject # WU-CW-05: Water Supply Improvement in Kungrad District and Subproject #WU-CW-09: Extension of Takhiatash. Bid opening under Subproject #WU-CW-09 is 25.03.2025.
105. Overall, the Project is anticipated to have significant positive effects on the quality of life and the environment for beneficiaries while ensuring the implementation of environmental safeguards to provide a continuous and reliable water supply and adequate sanitation facilities.

3.2. Subproject #WU-CW-10: NRW Equipment and OCS

106. The original project design included the development of an integrated operation monitoring and control system (SCADA) for the subprojects listed in Table 12.

Table 12: Subprojects to be Connected to Operation Control Center

Subproject	Project District	Subproject Infrastructure with SCADA Elements
WU-CW-01	Amudarya	- SCADA of the RU-1 WDU, Kilichboy WDU, Kuyuk-Kupir WDU - Flowmeters on the water network
WU-CW-02	Beruni	- SCADA of the PS-15, PS-17, Bodombosh WDU, Beruni WTP, Chlorination Stations 1 and 2 - Flowmeters on the water network
WU-CW-03	Nukus	- SCADA of the Abadan WDU, Kerder WDU, Madaniyat WDU and Nukus WDU - Flowmeters on the water network
WU-CW-04	Karauzyak	- SCADA of the Karauzyak WDU, Samat WDU, and Karatal WDU - Flowmeters on the water network
WU-CW-05	Kungrad	- SCADA of the Kungrad WDU, Akhunbabaev WDU, Ustyurt WDU, and Altinkul WTP - Flowmeters on the water network
WU-CW-06	Muynak	- SCADA of the Dustlik WDU, Muynak WDU, Uchsay WDU, Shagirlik WDU, and Tik-Uzyak WDU - Flowmeters on the water network

WDU = water distribution unit/station; PS = pumping station; WTP = water treatment plant; SCADA = supervisory control and data acquisition system

107. No SCADA system is available at Tuyamuyun WTP, and no SCADA component was foreseen under Subproject #WU-CW-08: Rehabilitation of Tuyamuyun PS.
108. No SCADA system is available at Takhiatash WTP, and no SCADA component is planned Subproject #WU-CW-09: Extension of Takhiatash WTP. Therefore, Tuyamuyun WTP and

- Takhiatash WTP will not be connected to Operation Control Center (OOC) to be established under Subproject #WU-CW-10: NRW Equipment and OCS.
109. Mangit WTP will be constructed under Subproject #WU-CW-07 and will maintain its own SCADA system. The water volume supplied to the Amudarya district network will be recorded at the OOC.
110. OOC is designed to integrate data acquisition from seven subprojects and maintain a common non-revenue water metering system. This system will enable remote monitoring and control of operations in the WDUs and WTPs, as well as facilitate remote monitoring of the district metered areas (DMA) within the networks. SCADA system configuration is illustrated in Figure 2 and also preliminary design drawings are provided in [Appendix 3](#).

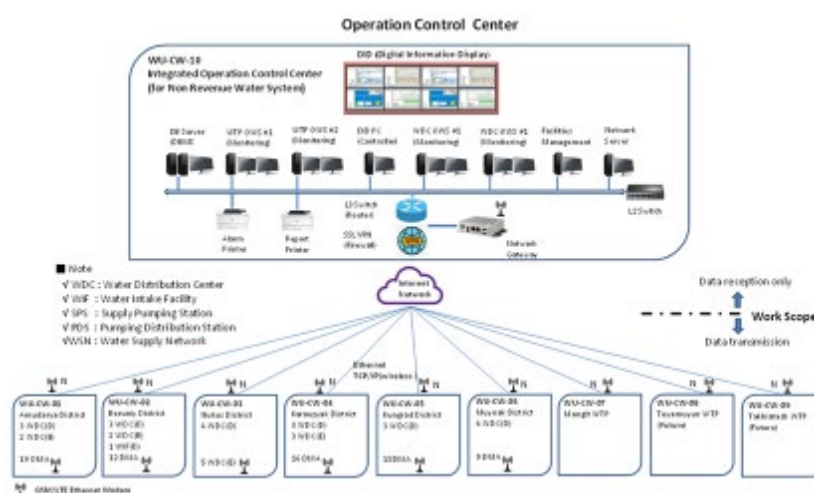


Figure 2: SCADA System Configuration
(Source: Subproject Design)

111. Design criteria for Subproject #WU-CW-10 include the following:
- SCADA should have full rights for remote monitoring of the project facilities, including operation of WDUs and DMA within the networks.
 - SCADA should be universal, compatible, and scalable, allowing for connections to WTPs, although these are not included in Subproject #WU-CW-10.
 - The control network configuration should utilize an open protocol to facilitate easy future expansion of the system.
 - The software license for the SCADA system should be valid for the lifetime of the system.
112. **Organization of data transfer.** The organization of data transfer to the Automated Process Control System (APCS) of the WDU will be achieved using a programmable controller known as the Remote Terminal Unit (RTU). This controller will be responsible for the collection, processing, archiving, and transmission of telemetric data from the facility to the SCADA system. Additionally, it facilitates telecontrol of the facility through SCADA. Telecontrol involves providing recommendations from the SCADA dispatcher to

- the on-duty personnel regarding the optimal speed settings for the electric pumps, as well as monitoring and controlling the water pressure within the pipeline.
113. Data exchange between the SCADA system and the USPD controller (RTU) will be conducted through a Virtual Private Network (VPN) over the Global System for Mobile Communications (GSM)/General Packet Radio Service (GPRS) cellular network, following the international telemechanic standard protocol IEC 60870-5-104. Additionally, the RTU controller supports the Service for Uniform Time Synchronization (STSS).
114. **Tele control TU:** The RTU controller will be equipped to connect fire and security alarms. It will provide both Ethernet and RS-485 ports for this purpose. The status information will be transmitted to the WDC control system using standard international telemechanic protocols, specifically IEC 60870-5-104, as well as Modbus RTU and Modbus Transmission Control Protocol (TCP).
115. The design of the SCADA interface includes the following elements:
- The network protocol for the WDUs, Water Treatment Plant (WTP), and Operational Control Center (OCC) will utilize Ethernet TCP/IP over an internet network.
 - The WDU system will have a wired data transfer network to ensure reliability and stability.
 - The signal transmission for the water transmission pipeline flow meter will be designed for 3G/4G wireless communication to facilitate easy maintenance.
 - The network protocol connecting the SCADA system of the WDU subprojects to the Integrated OCC will follow a PC-to-PC configuration using Ethernet TCP/IP.
116. The SCADA system network protocol is schematically illustrated in Figure 3.

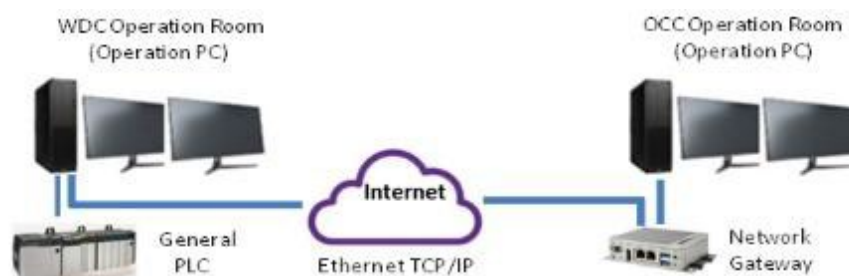


Figure 3: SCADA System Network Protocol with WDUs
(Source: Subproject Design)

117. The flow meter for the water transmission pipeline will use Ethernet TCP/IP as its network protocol, utilizing a wireless Internet connection as illustrated below.

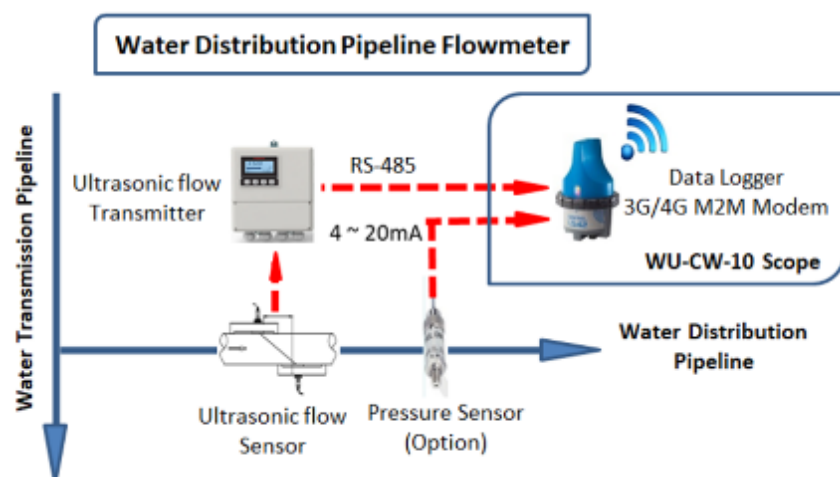


Figure 4: Flow Meter Network Protocols
(Source: Subproject Design)

118. OCC SCADA System Configuration comprises the equipment specified in Table 9.

Table 13: Equipment and Machinery for OCC

Equipment and Machinery	Q-ty	Technical Specifications
Digital Information Display (DID)	1 set	- DID (Digital Information Display) 55 inch, 2*4(8ea) - Resolution: 1920 x 1080 (FHD) or higher - Bezel thickness: 0.44 mm - IP Wall Controller - Operating with DID management workstation (CPU Intel Core i-9, 6.0GHz , HDD 4TB, monitor 32" IPS, - Life Span: 60,000Hrs (Typ.) / 50,000Hrs (Min.) - OS: Window 11 Professional 64bit - Keyboard and mouse - Guide Bracket/Front interior - DID operating with management workstation
Database server (Server 1 and Server 2)	2 sets	- Redundant configuration, Rack mount type: Intel Xeon® Gold 6444Y (16-Core, 3.6GHz, 270W) - OS : MS Windows 2022 Server - Office S/W: Office 2021 Professional min/Excel Required - DBMS PKG: Standard Edition 10 USER - MS office & virus software - KVM Switch, integrating a 17-inch keyboard and TFT LCD
FMS (Facility Management System)	1 set	- Workstation - Intel Core i-9, 6.0GHz - Color monitor: 32" IPS - Memory: 64 GB DDR5 ECCRAM - Hard disk: 4TB - Alphanumeric keyboard & mouse - OS : Window 11 Professional 64bit - MS office license and antivirus software
NTP Server (Web Server)	1 set	- Workstation, Rack mount type, PC class above: - Intel Core i-9, 6.0GHz - Memory: 64GB DDR5 ECCRAM - Hard disk: 4TB

Equipment and Machinery	Q-ty	Technical Specifications
		– OS: Window 11 Professional 64bit – MS office license and antivirus software
UTM	1set	• UTM (Unified Threat Management) • VPN / Firewall
Operator's Workstation (OWS/EWS)	4 sets	• Workstation, Desktop type PC, class above: – Intel Core i-9, 6.0GHz – Color monitor: 32" * 2 – Memory: 64GB DDR5 ECCRAM – Hard disk: 4TB – Alphanumeric keyboard & mouse – OS: Window 11 Professional 64bit – HMI Software Package (Runtime/ Development) – MS office license and antivirus software
Printers	1 set	• Laser Multifunction Printer (A4) – A4, Black and White – Print, Copy, Scan, Fax, Duplex, – Automatic Document Feeder (ADF) – Dynamic security enabled printer – Black (Normal, A4): Up to 33ppm, Black (Duplex, A4): Up to 20ipm, High-Speed USB, Ethernet, Wi-Fi, Dual Band, BLE. • Inkjet Printer (A3) – Print Method: On-demand inkjet – High-yield ink bottles – Print speed up to 15ipm – Draft, A4 (Black / Colour): Approx. 30 ppm / 17 ppm – Print resolution up to 5760 x 1440 dpi – Maximum Paper Size: 12.95 x 44" – Color Nozzle Configuration: 59 per color (Cyan, Magenta, Yellow) – Print Direction: Bi-directional printing, Uni-directional printing
Network Facilities	1 set	• Industrial 4G cellular modem & router • L2 Switch: 24Port x 52GMbe, • L3 Switch: 24Port x 1Gbe • Fiber optic cable (FOC-MM) • Network Gateway: Network redundancy/ 2 Ethernet Ports, Redundant CPU/ Power module, up to 20 Series Ports (RS232/RS485) • Accessories (cables, terminal blocks, other accessories)
System Rack	3 sets	• 19" Server Rack (42U) for installation: – DB Server 1 and DB Sever 2 – KVM Switch – Network Gateway – NTP Server – Industrial 4G cellular modem and router – L2 Switch – UTM – L3 Switch
UPS & battery	1 set	• 3Ph 380V/220V, 20kVA • Back up time 60min • Includes automatic voltage regulation function
Digital Water Leak Detector	12 sets	• Universal Leak Locator & Acoustic Listening Device (6 districts x 2)
Equipment and furniture for equipping SCADA rooms	1 set	• Server cabinets, desks, chairs, staff cabinets, printer cabinets, interactive whiteboard, etc.

Equipment and Machinery	Q-ty	Technical Specifications
Vehicles for maintenance of project sites	6 sets	Overall dimensions: not less than 3480x1390x1910 mm Wheelbase: not more than 1850 mm Number of seats, not less than 6 Rear-wheel drive vehicle Carburetor engine, capacity not less than 795 cm3 Engine capacity, about 40 hp Number of cylinders - 3 in a row Mechanical 5-speed gearbox Hydraulic brake system Front brakes are disc brakes and rear brakes are drum brakes.

(Source: Subproject Design)

119. **SCADA Workstations:** The SCADA processing system shall be capable of effectively and efficiently supporting the system software and the functions as detailed in this specification. The SCADA Workstation will include a server and other necessary hardware, such as monitor, keyboard, mouse, etc. and will be of the following specifications:

Table 14: Workstation Specifications

Workstation Component	Specifications
Processor	Intel Core i-9, 6.0GHz
Memory	64GB DDR5 ECCRAM
Hard disk	4TB
Monitor	32inches, dual IPS monitor
Accessories	Keyboard & Mouse, Speakers
Operating System (OS)	Microsoft Windows 21 Pro (Newest version)
SCADA Software	HMI package (Runtime/ Development) Full Version/Full Tag SCADA system all software licenses are valid for life
Microsoft Office	Professional (Newest version)
Vaccine Software	Anti-virus premium class
Other specifications	Environmental specifications for workstations should prioritize energy efficiency and sustainable materials, including • ENERGY STAR certification – workstation, monitors, and other peripherals should meet ENERGY STAR requirements. • sleep mode • low energy consumption in active and idle modes. • made of sustainable materials with minimum use of hazardous substances. • designed for recyclability.

(Source: Subproject Design)

120. **Facility Management System.** A facility management system (FMS) in a water infrastructure is a facility for efficient operation, maintenance, and monitoring of key components including pumps, valves, MCC panels (Motor Control Center Panels), field instruments, and SCADA systems (Supervisory Control and Data Acquisition Systems), and plays a critical role in optimizing the operation and maintenance of key equipment. FMS installation is included in each subproject in Table 8.

121. Key FMS functions will include:
- Real-time Monitoring: Integrating with the SCADA system to monitor the status of pumps, valves, MCC panels, and field instruments.
 - Remote Control and Automation: Providing both automatic and manual control functions to ensure efficient operation of the water treatment process.
 - Anomaly Detection and Alarm System: Detecting and alerting for abnormal conditions such as equipment malfunctions or exceeding water quality thresholds.
 - Data Analysis and Reporting: Collecting and analyzing operational data to establish optimal management strategies.
 - Maintenance Planning Support: Developing preventive maintenance plans based on equipment usage history and condition.
122. **Digital Information Display.** The display should have sufficient brightness to enable visual monitoring even under bright illumination, and it should be possible to display various computer and video image data. It is all-in-one equipment exclusively for the central control room that can be operated continuously 24 hours/7 days, and it must be a device that considers stability and operational convenience. Specifications are provided in Table 9.
123. **System network:** The system will utilize a dedicated process control communication network (Local Area Network) for data transmission. It will support high-speed communication and large-scale coverage through a dedicated redundant Data-Way that connects all the devices within the system. Additionally, an internationally recognized communication method will be adopted to facilitate future expansion and enable connectivity with different systems. The communication infrastructure will interconnect each node within the network, designed with a redundant structure. The network status, alarms, and other metrics will be monitored in real time by the operating system.
124. **NRW Equipment.** SCADA system in water supply systems will help identify non-revenue water (NRW) and leaks by providing real-time monitoring and data analysis, enabling early detection of anomalies and efficient leak localization. By analyzing the collected data, SCADA system will identify anomalies or deviations from expected patterns, such as sudden increases in minimum flows, pressure drops, or equipment malfunctions, which can indicate potential leaks or NRW. Once a potential leak is identified, SCADA system will pinpoint the location of the leak by analyzing the data from specific areas of the network, such as DMAs. Early detection and localization of leaks through SCADA systems enable prompt repairs, reducing the duration of leaks and minimizing water loss. SCADA system will also be used to simulate the appropriate pressure of the water network, which is helpful to avoid excessive pressure in the water network and reduce NRW.
125. NRW Equipment will be used to detect and locate leaks in pipelines, to prevent water loss, reduce maintenance costs, and ensure efficient water distribution. The project is foreseen purchasing 12 sets of digital water leak detectors with specifications provided in Table 9.
126. **Premises for OCC:** It was planned that the Operation Control Center (OCC) for the SCADA system would be established in the existing dispatcher building of the water utility

in Nukus city. However, during the PMC mission to the site in December 2024, it became clear that the building intended for the SCADA installation required significant repairs. So, the water utility requested that the building rehabilitation be included in the SCADA contract.

127. The rehabilitation and renovation of the existing building that currently houses the control center are planned. The project will include replacing the roof and some of the roofing materials, completely renovating all rooms and hallways on the first and second floors, updating the heating system and power supply, as well as renovating the building's exterior. Other civil work will involve energy efficiency upgrades. This includes:
 - Renewing the power supply system with energy-efficient lamps (LED lighting).
 - Installing rooftop solar panels to offset operational energy use.
 - Replacing old windows and doors with energy-efficient options minimizes heat transfer, further reducing energy consumption.
 - Installing new heating, ventilation, and air conditioning (HVAC) systems for 24 rooms, and enhancing the HVAC system in the server room.
 - Improving insulation in walls, roofs, and floors to reduce heat loss.
128. During renovation, existing building materials such as bricks and wood will be used to minimize waste. In addition, the contractor will select non-toxic, low-VOC paints, and sealants.
129. General data of the building allocated for OCC is as follows:
 - Two-story building, built in 1992.
 - Base area of the building 19.22x12.67m=243,51 m²
 - Reinforced concrete flooring, burnt brick walls
 - Windows (30 pcs.) and doors (20 pcs.) are wooden
 - Total of 24 rooms in the building: 1st floor – 13 rooms and 2nd floor – 11 rooms
 - The total rooms area is 392.04 m².
130. The project envisages repairing all rooms. Figure 5 provides an overview of premises within the building.

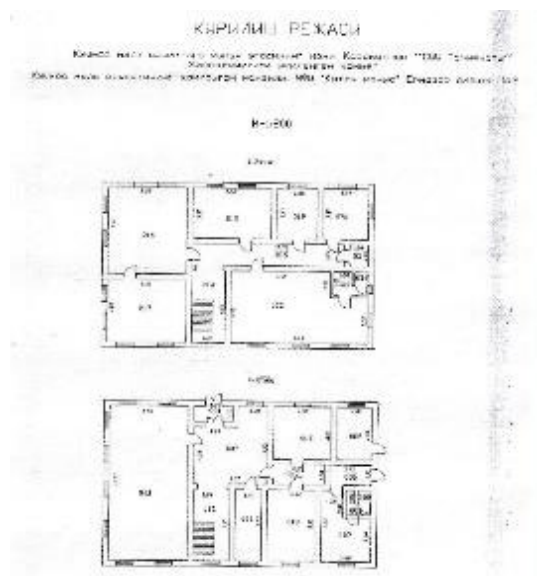


Figure 5: Layout of the Building
(Source: Excerpt of Cadaster Documents)

131. The water utility allocated the two premises #016 and #017 for establishing OCC:
 - **SCADA Control Room.** It is room #016 in Figure 5, and it measures 5.56 m in width, 8.77 m in length, and 3.0 m in height. The scope of work for this area includes the removal of existing partitions, windows, doors, floors, ceilings, and wall plastering, as well as the restoration of the walls. Additionally, a new partition will be constructed between the operator's room and the server room.
 - **SCADA Server Room.** It is room #017 in Figure 5 and has dimensions of 5.56 m in width, 3.0 m in length, and 3.0 m in height. The project involves removing existing windows, doors, flooring, ceilings, and plaster walls, followed by repairs to the server room. During the repair process, the contractor must adhere to the requirements specified in the applicable national standard, [O'zDST 2875:2014, Information technology. Requirements for datacenters. Infrastructure and information security](#).
132. The scope of work includes redesigning the entrance to sanitary unit #023 (Figure 5). This will involve creating an entrance to sanitary unit #023 from premises #015 or #021 while closing the entrance from room #022.
133. A training center is being proposed to be established in room #022, as shown in Figure 5. This center will provide training for water utility personnel on the operation of SCADA systems. The facility will be furnished with tables, chairs, and an interactive whiteboard, which is a large display used for performing tasks independently or alongside a computer. The layout of the tables, chairs, and interactive whiteboard is illustrated in Figure 6.

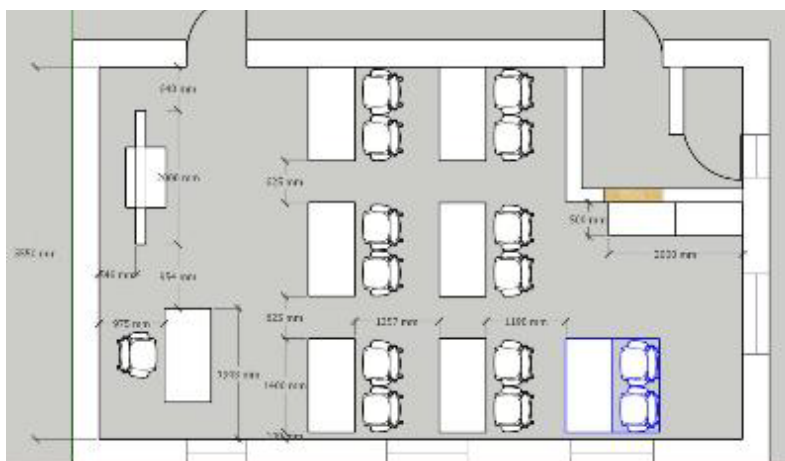


Figure 6: Training Center
(Source: Subproject Design)

134. Table 15 provides an overview for the civil work included in Subproject #WU-CW-10.

Table 15: Civil Work Included in Subproject #WU-CW-10

Activities	Description
Interior decoration of premises	• Removing wooden door blocks • Removing wooden window blocks • Dismantling the partition • Stripping walls from old plaster • Removing wooden floors • Ceiling – painting with moisture-resistant paint • Brick masonry with reinforcement - partitions t=120mm • Metal racks and lintels for partition • Installation of aluminum doors (2100x900) • Installation of aluminum window (1700x1200) • Installation of aluminum doors (2400x1200) • Plastering of walls with cement-lime mortar and painting • Wall cladding with glazed tiles • Linoleum flooring • Ceramic tile floors • Metalwork installation (stair railings)
Exterior finish of the building	• Stripping walls of old plaster • Dismantling of metal structures • Glue universal polymer water-resistant, basalt insulation 50mm thick, facade reinforcing mesh, polymer primer • Cladding of the basement with porcelain stoneware • Monolithic concrete and reinforced concrete (stairs, ramp). Structural reinforced concrete elements made of concrete on sulfate-resistant Portland cement. • Monolithic concrete. Reinforced concrete (stairs, ramp). Structural reinforced concrete elements of concrete on sulfate-resistant Portland cement.
Roofing	• Corrugated board on wooden structures • Vapor barrier, thermal insulation with expanded clay with t=125mm, cement-sand screed with t=30mm, waterproof pavement • Galvanized shaped elements • Gutter installation, including gutters, pipes, outlets and fasteners.
Internal water supply and sewerage networks	• Domestic and drinking water supply. Dismantling of the old system. Installation of the new system (pipelines, plastic valve, bends, transition, adapters, tees, clips, etc.). • Hot water plumbing. Dismantling of the old system. Installation of the new system (electric water heater, pipelines, plastic valve, bends, transition, adapters, tees, clips).

Activities	Description
	• Sewerage. Dismantling of the old system. Installation of the new system (piping, sinks, basins, toilets, shower trays, bends, tees, revisions, sleeves, etc.)
Heating, ventilation and air conditioning	• Complete removal of old heating. Install a new heating system, including boiler room with wall-mounted gas boilers (capacity to be determined by calculation), manifold, circulation pump, expansion tank, pipes, fittings, bends, tees, bimetallic sectional radiators, taps, etc. • Install air conditioning system for control room computers and video panel, as well as rooms for server computers and uninterruptible power supply. • Complete dismantling of the old ventilation system. Installation of a new ventilation system, including wall and duct fans, galvanized steel air ducts, transitions, diverters.
Power Supply and Instrumentation and Automation	• Dismantling of old and installation of new distribution and lighting panels, considering the anticipated loads. Including replacement and installation of: LED light fixtures, switches, plug sockets, circuit breakers, etc. • Installation of automatic fire extinguishing equipment. • Installation of solar panels (capacity to be determined by calculation). • Solar panel kit including monocrystalline solar panel, hybrid inverter, batteries, connectors, terminals, wires and cables, metal structure for panel mounting, etc.
Cable networks	Cable networks 0.4kV cable networks and territory lighting
Landscaping	Landscaping of the area adjacent to the building

(Source: Subproject Design)

135. Some other requirements include implementing efficient HVAC system and optimizing building insulation that can minimize energy use for heating and cooling and using energy-efficient LED lighting and other appliances to reduce energy consumption and emissions.

136. The Subproject #WU-CW-10 implementation period is 12 months.

4. DESCRIPTION OF THE ENVIRONMENT

4.1. Physical Conditions

4.1.1. Subproject Location

137. The subproject site is the existing Central Dispatcher Station building of the water utility, QST LLC and has the following GPS position:

- 42°30'52.07"N 59°35'31.70"E
- 42°30'52.10"N 59°35'32.22"E
- 42°30'51.53"N 59°35'32.28"E
- 42°30'51.50"N 59°35'31.73"E

138. The site of Subproject #WU-CW-10 is located at 295 Ernazar Alakoz Street in the Kutli-Konis community in Nukus city ([Figure 7](#)).



Figure 7: Subproject Location and Immediate Surroundings

(red area = project building; green area = main administrative building of water utility; violet area = Nukus WDU; dotted line = fence of Garden named after Allaniyaz Kaharman; brown arrows = access roads)

139. Nukus is a city located in the southern part of Karakalpakstan, situated on the right bank of the Amudarya River, approximately 800 km northwest of Tashkent. The southern and eastern sections of the city are bordered by the Kyzylkum Desert, while the northern part lies along the Amudarya River. Two main canals, the Kizketken (also known as Doslyk) and the Anasai (or Kattagar) Canals, run through the city. Nukus city covers an area of 222 km² and has a population of approximately 317,300 residents.
140. The screening observations of the project site reveal the following details:
- The existing Central Dispatcher Station's building is within the fenced and secured water utility area in the northwestern part of Nukus. This area borders the Nukus water collection and distribution station (referred to as the water distribution unit, Nukus WDU) to the west, two buildings supporting engineering facilities and a garage to the north, the main administration building to the south, and the Nukus-Shymbay highway to the east.
 - To the south, the water utility area adjoins two residential neighborhoods – the Uzynkul and Kuibyshev districts.
 - There are two paved driveways providing access to the dispatcher station building.
 - The water utility borders Canal Doslyk, providing water to Nukus WDU, and has no access to the canal from the dispatcher station building territory. The dispatcher station building is approximately 240 m from the canal's bank.
 - Directly across the Nukus-Chimbay highway, there is idle land covered by natural rare vegetation typical to the region (mostly ephemeral plants, camel thorns, and sagebrush). The land is free from residential or public buildings, but is partially occupied by a greenhouse, about 200 sq. m. The idle land borders the Allaniyaz Kahraman Garden to the east. The distance from the dispatcher station building is approximately 114 m, and the distance from the water utility fence is about 64 m. The site's immediate surroundings are illustrated in [Figure 7](#).
 - The nearest residential houses are about 210 m to the northeast and 370 m to the south and southeast from the dispatcher station building.
 - The closest cemetery is about 2.1 km southeast of the water utility territory.
 - The distance from water utility territory to Lake Ashshikul is approximately 3.2 km to the southeast.

4.1.2. Land Use

141. The subproject is an existing building, being an asset of the water utility, which was confirmed by the cadaster documents. The excerpt for land ownership documents is provided in [Appendix 5](#). The total area of the project building is 243.51 m², located on the 19.22x12.67 m land plot.
142. The building is used as Central Dispatcher Station for water supply infrastructure monitoring in the Karakalpak Republic.



Figure 8: Project Building as Central Dispatcher Station
(Source: PMC's Field Missions in October and December 2024)

4.1.3. Site Condition

143. The project building was surveyed by Specialized Architect and Building Inspection, which operates under the Ministry of Construction and Housing and Communal Services of the Republic of Karakalpakstan. This government authority possesses the necessary license, skilled personnel, methodology, and equipment to conduct structural assessments. The inspection team examined both the exterior and interior of the property, including its structural elements and systems, to identify any defects, damage, or areas that require maintenance. The findings from the structural survey are detailed in [Table 16](#).

Table 16: Structural Survey Findings

Building Structure	Structural Survey Finding by State Building Department
The building's foundation consists of precast reinforced concrete blocks and strip cement structure	The structural condition was found to be satisfactory during the inspection.
The inner walls are constructed from burnt bricks. The outer wall surface is finished with plaster, including marble chips.	The structural condition was found to be satisfactory during the inspection while wall decoration was unsatisfactory.
The doors and windows are made from various materials. Some areas have window and door frames made of MDF (Medium-density fiberboard), while others feature frames made of metal or wood.	The technical condition was found to be unsatisfactory during the inspection.
The flooring varies across the premises; some rooms have wood flooring, while others are fitted with linoleum, parquet, or ceramic tiles.	The technical condition was found to be unsatisfactory during the inspection.
The ceiling is composed of a precast reinforced concrete slab.	The structural condition was found to be satisfactory during the inspection, but the ceiling decoration required new plastering.
The roof is covered with roofing felt based on bitumen coatings, without any shingles or tiles, required for additional protection against water damage.	The technical condition was found to be unsatisfactory during the inspection.

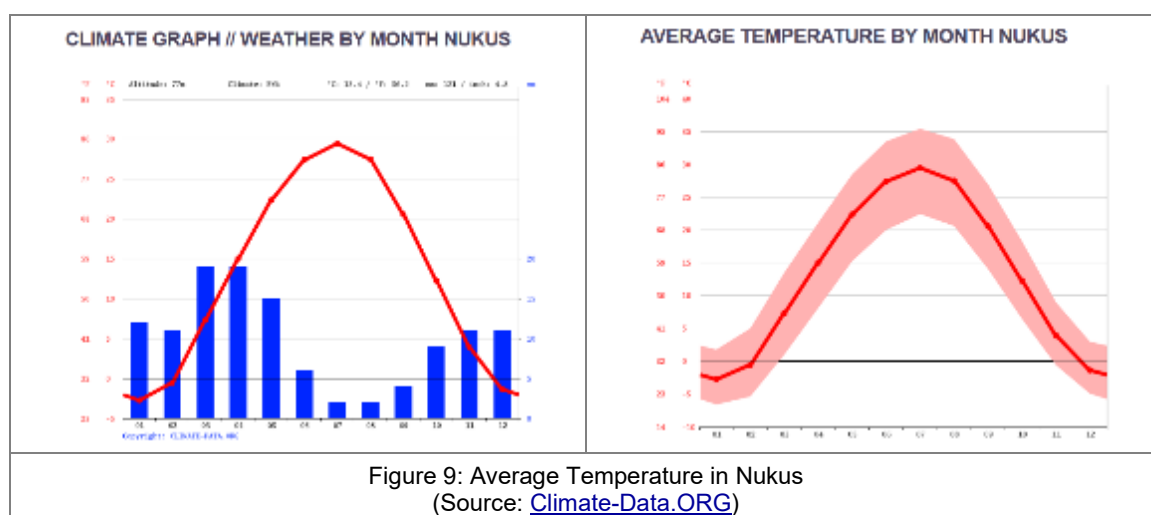
(Source: Survey Report of Specialized Inspection under Karakalpak Republican State Building Department)

144. Specialized Architect and Building Inspection has identified several backlog repairs that need immediate attention to prevent further deterioration and recommended the following actions:
- To reduce the load on the outer wall, the existing marble chip plaster coating should be removed. The wall structure should then be reinforced with new plaster, and the foundation wall should be strengthened by adding steel braces and cement work. Additionally, concrete work should be carried out in the blind area surrounding the foundation, ensuring it has a width of at least one meter as base isolation technique.
 - After the current plaster is removed, repairs and finishing work on the interior walls will be necessary.
 - The windows and doors need to be replaced, as they are draughty or broken.
 - The flooring requires renovation, which may include pouring concrete, pressing tiles, or installing wood laminate.
 - The firefighting system should be redesigned and properly installed.
 - Despite the building is equipped with power, water and wastewater systems, utility service installations, including pipes and equipment, need to be replaced.
 - The roof should be replaced with new, modern materials to ensure water insulation and prevent structural deterioration.
 - Finally, the property would benefit from exterior redecoration.
145. The Specialized Architect and Building Inspection did not find any ACM in the building's structure, roofing, or insulation.
146. The survey team found the project building overall in good structural condition while requiring some improvements in redecoration, replacement of doors, windows, roofing, etc.

4.1.4. Climate

147. The Karakalpak Republic, located in Western Uzbekistan, covers much of the Kyzylkum Desert and the newly formed Aralkum Desert, which emerged due to the disappearance of the Aral Sea. The area features a vast, flat, sandy plain dotted with small hills.
148. The region also borders the Karakum Desert to the south and features a rocky plateau to the west, near the Caspian Sea, a slightly undulating landscape with flat summits that rise to some 292 m above sea level. In the center of the region are the valley and delta of the Amudarya river, a low-lying area crossed by streams and canals.
149. It is an arid region experiencing an extreme continental desert climate characterized by low precipitation and high evaporation rates. The majority of the territory consists of the Usturt and Kyzylkum plateaus. Between these plateaus lies the drained Aral Sea, the delta of the Amudarya River, and the newly formed Aralkum desert.
150. The Subproject #WU-CW-10 is in Nukus city, capital of the Republic of Karakalpakstan. Nukus city has a deserted climate. Throughout the year, precipitation is virtually non-

existent in Nukus. According to Köppen and Geiger, this climate is classified as BWk. The mean yearly temperature recorded in Nukus is 13.4 °C. The precipitation level on a yearly basis amount to 121 mm as per the meteorological records.



151. The hottest month of the year is July, with an average temperature of 29.4 °C. In January, the temperature drops significantly, reaching an average low of about -2.7 °C.

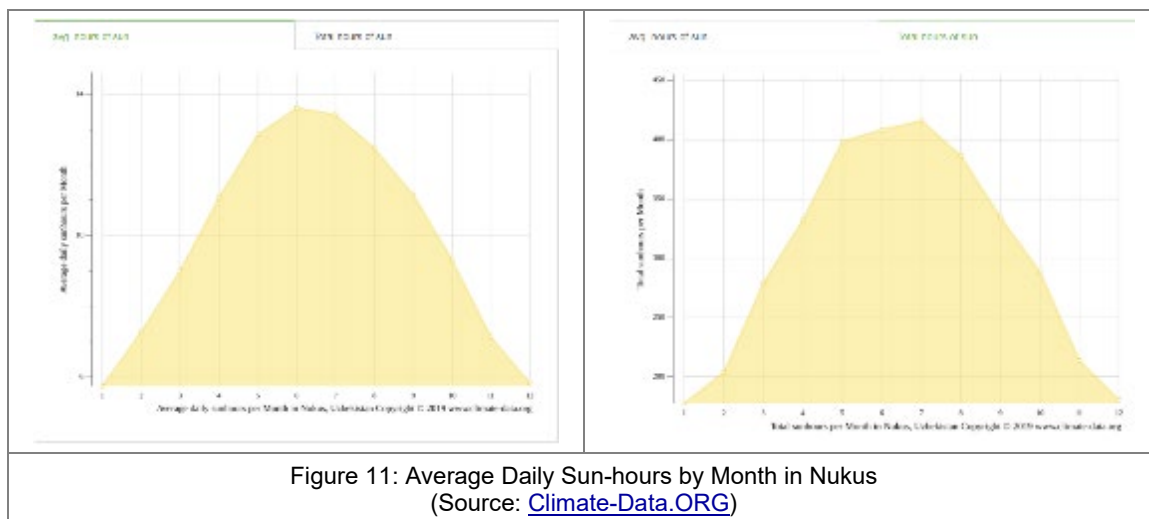
	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature °C (°F)	-2.7 °C (27.1) °F	-0.5 °C (31) °F	7.3 °C (45.2) °F	16 °C (59) °F	22.4 °C (72.2) °F	27.1 °C (81.3) °F	29.4 °C (85) °F	27.5 °C (81.5) °F	20.6 °C (69) °F	12.8 °C (55.1) °F	3.9 °C (39.1) °F	-1.1 °C (28.5) °F
Min. Temperature °C (°F)	-8.8 °C (20.2) °F	-5.4 °C (22.4) °F	1 °C (33.6) °F	8.1 °C (46.6) °F	15.3 °C (59.5) °F	20 °C (68) °F	22.4 °C (72.4) °F	20.8 °C (69.1) °F	14.1 °C (57.3) °F	6.5 °C (43.8) °F	-0.6 °C (31) °F	-1.8 °C (28.1) °F
Max. Temperature °C (°F)	1.8 °C (35.2) °F	5 °C (41) °F	13.5 °C (56.3) °F	21.1 °C (70) °F	28.5 °C (83.3) °F	33.5 °C (92.3) °F	35.4 °C (95.7) °F	33.8 °C (92.9) °F	26.9 °C (80.5) °F	18.3 °C (64.9) °F	9 °C (48.2) °F	3 °C (37.4) °F
Precipitation / Rainfall mm (in)	12 (0)	11 (0)	19 (0)	16 (0)	15 (0)	8 (0)	2 (0)	2 (0)	4 (0)	9 (0)	11 (0)	11 (0)
Humidity (%)	68%	84%	53%	43%	35%	30%	31%	32%	37%	48%	65%	68%
Rainy days (d)	2	2	3	3	3	1	1	0	1	2	2	2
avg. Sun hours (hours)	5.7	7.3	9.0	11.1	12.9	13.8	13.4	12.5	11.2	9.3	7.1	5.8

Data: 1981 - 2021 Min. Temperature °C (°F), Max. Temperature °C (°F), Precipitation / Rainfall mm (in), Humidity, Rainy days. Data: 1999 - 2019: avg. Sun hours

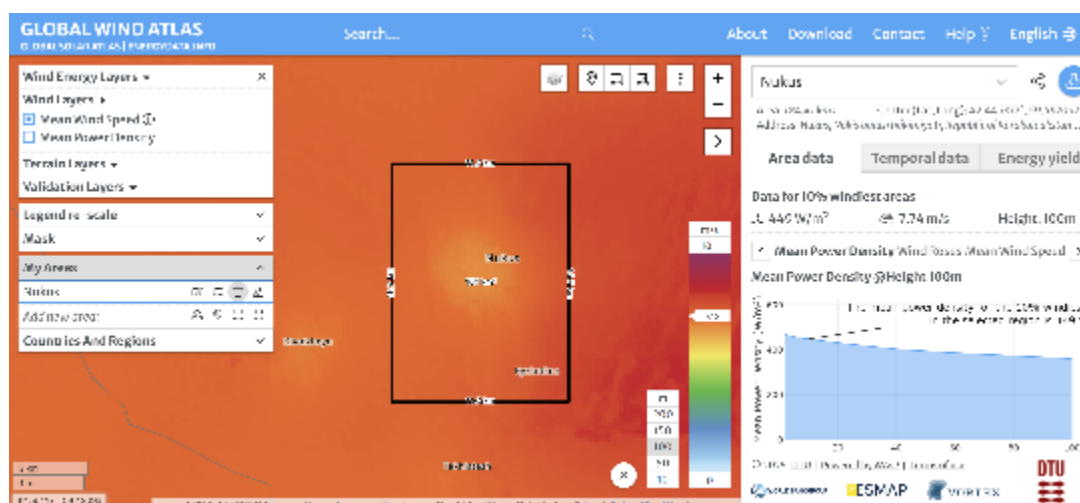
Figure 10: Average Weather by Month (1991-2021), Nukus city
(Source: [Climate-Data.ORG](https://climate-data.org))

152. The difference in precipitation between the driest and the wettest months is 17 mm. The yearly temperature fluctuates by approximately 32.2 °C.
153. In terms of relative humidity, December has the highest level at 30.28%, while June has the lowest at the same percentage of 30.28%. Notably, March experiences the highest number of rainy days, averaging 4.10 days, whereas August has the least rainfall, with only 0.50 wet days.
154. On average, Nukus experiences the highest number of daily sunshine hours in June, with a mean duration of approximately 13.42 hours of sunlight per day. This results in a total cumulative sunshine count of about 416.1 hours for the month. Conversely, January sees

the lowest daily sunshine hours in Nukus, with an average of only 5.83 hours of sunlight per day, leading to a total accumulation of approximately 180.59 hours for the month. Throughout the entire year, Nukus records a total of 3,621.11 hours of sunlight, which averages around 301.76 hours per month ([Figure 11](#)).



155. According to the Uzbek building standard⁴⁹, the average wind speed in Nukus city is 6.4 m/s in January and 4.1 m/s in July. The highest average monthly wind speed for the year is recorded in April, at 4.4 m/s. The predominant wind direction is the northern. [Figure 12](#) illustrates an overview of the wind rose, mean wind speed, and its variability in the project area, based on data from the Global Wind Atlas. On 25.03.2025, a wind speed was recorded as 7.74 m/s.



⁴⁹ Uzbek building standard #ShNK 2.01.01-22, Climatic, Physical and Geological Data for Engineering Design, https://mc.uz/uploads/mcuz_906110586882.pdf



Figure 13: Wind Speed Variability in Nukus
(Source: [Global Wind Atlas](#))

4.1.5. Topography

156. The Nukus area features a flat plain that slopes northwestward, predominantly consisting of the Kyzylkum Desert. The terrain is mostly an urban built environment, with minor idle land comprising sandy soil and sparse natural vegetation. The elevation of this plain ranges from 74 m to 80 m ([Figure 14](#)).



Figure 14: Topographic Map of Nukus city
(Source: <https://ru-ru.topographic-map.com/>)

157. The topography of the site has several key features:
- The terrain is flat, with an elevation ranging from 76 to 78 m.
 - Existing structures include the Central Dispatcher Station, which borders the Nukus WDU to the west, and the QST LLC's main administrative building located to the north.

- Underground communications include water lines connecting the Nukus WDU to the city's network.
- The land surrounding the project building is paved and fenced.
- The surroundings are urban built-up areas, where water network pipes, gas supply networks, and power supply infrastructure represent engineering communication.

4.1.6. Geology

158. Uzbekistan's territory is a part of the Turan Tectonic Platform, represented by an alluvial plain with aeolian processes. The platform has a multifaceted basement of sedimentary, metamorphic, and igneous rocks belonging to the Late Paleozoic orogenic belt, as well as salt-bearing sediments from the Carboniferous to Quaternary periods.
159. The geological conditions of the Republic of Karakalpakstan are likely the result of formation during the Mesozoic and Cenozoic eras. The project area is surrounded by three deserts, each with distinct geological characteristics:
- The Kyzylkum Desert is characterized by geology composed of carbonates, sandstones, and red shales that were deposited during the Mesozoic era.
 - The Karakum Desert comprises gray sandstone, limestone, and shale from the Aptian and Albian periods, as indicated by marine fossils discovered in the area.
 - The Aralkum Desert consists of sand, sandstones, and sedimentary rocks that originated from the seabed.
160. Nukus city, situated along the delta of the Amudarya River, has saline soil and groundwater that primarily consists of chlorine-sulfate salts. Miocene rocks from the Neogene-Quaternary and the Amudarya River sediment deposits characterize the geological conditions of the area surrounding Nukus.

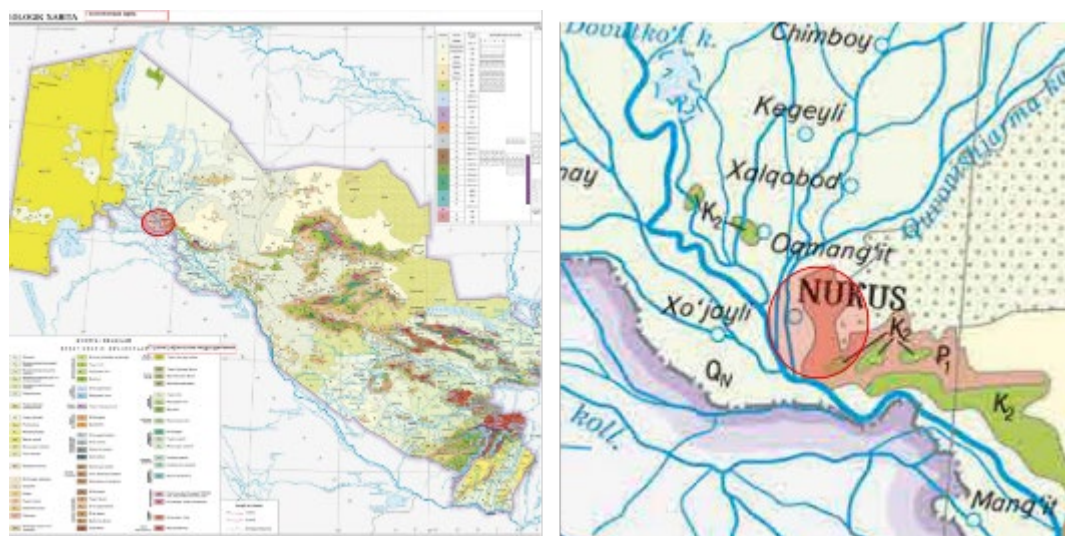


Figure 15: Geologic Map of Uzbekistan – Nukus Area
(Source: National Atlas of Uzbekistan)

161. The soil profile includes eluvial and diluvial deposits of sand, gravel, sandy soil, gypsum, silty-clayey soils with coarse-grained inclusions, and “*taqir*” soils, i.e., black alkali soils – solonetz soils, characterized by high concentrations of exchangeable sodium, resulting in a hard, cracked surface and poor water infiltration. Although the area has a high groundwater table, the geologic conditions are characterized by a hard-cracking land surface due to the presence of high sodium content in the soil and low soil fertility.
162. The seismic activity and tectonic characteristics of the project area are influenced by four major tectonic plates – Arabia, Eurasia, India, and Africa – and one smaller tectonic block, Anatolia. The geological development of this region results from key plate tectonic processes, including subduction, large-scale transform faulting, compressional mountain building, and crustal extension.
163. The project area is close to the active seismic South Tien Shan zone and has a seismic intensity of up to 7, with a recurrence frequency of once every 1,000 years. The following recent earthquakes have influenced the project area with magnitude measured at 3-4:
 - The Afghanistan earthquake of 21.03.2023⁵⁰ with a magnitude of M=6.6.
 - The Afghanistan earthquake of 05.01.2023⁵¹ with a magnitude of M=6.0.
164. The project area has also a history of some strong earthquakes, including
 - The Kunya-Urgench earthquake of 1208 with a magnitude of M=6.2.
 - Two Gazli earthquakes in 1976 and 1984 with magnitudes ranging from 7.0 to 7.3.
165. The seismic map of Uzbekistan, along with data on the strongest earthquakes in the region, is provided in [Figure 15](#).

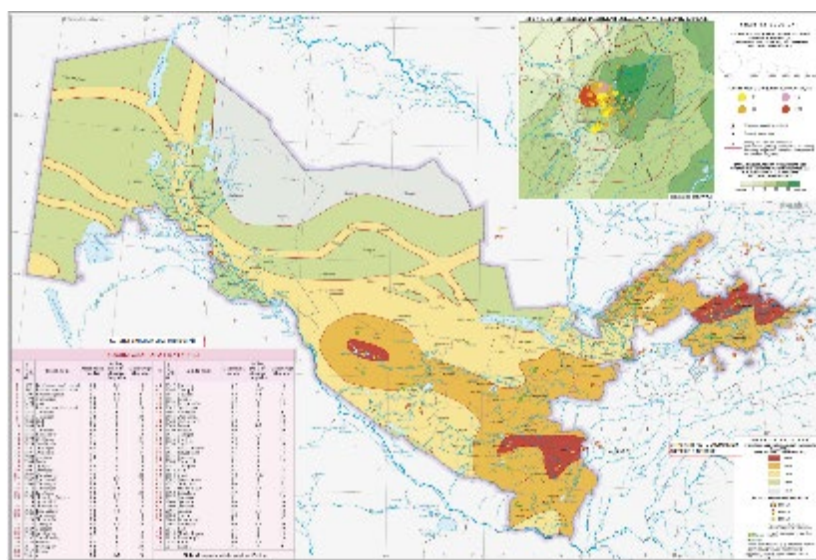


Figure 16: Seismic map of Uzbekistan
(Source: National Atlas of Uzbekistan)

⁵⁰ <https://aktualno.uz/ru/a/8597-uzbekistan-oshhutil-otgoloski-zemletryaseniya-v-afganistane>

⁵¹ <https://www.gazeta.uz/ru/2023/01/05/earthquake/>

4.1.7. Water Resources

166. The project area is in the Amudarya River basin. Nukus city lies along the right bank of the river as illustrated in [Figure 17](#).

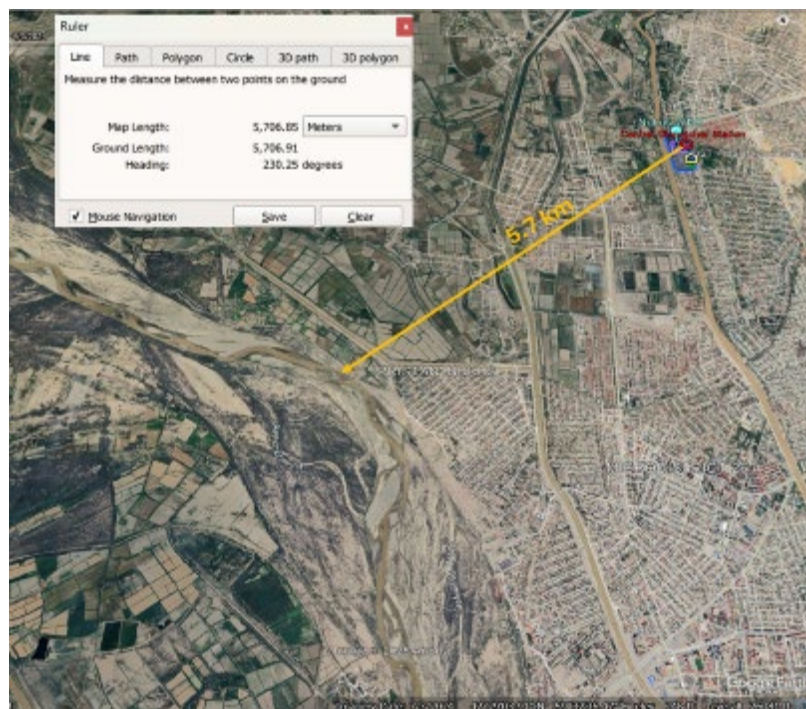


Figure 17: Distance from Project Site to Amudarya River
(Source: Google earth)

167. The Amudarya is the largest river in Central Asia, with a drainage area of 309,000 km² and a length of 2,540 km. This transboundary river spans Afghanistan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan, with three main tributaries: the Kafirnigan, Sherabad, and Surkhandarya rivers. The total average annual flow of the Amudarya River is 73 km³, with a storage volume of 24 billion m³.
168. The color of the Amudarya River is dark chocolate. The river is muddy and carries a vast number of suspended particles. The river has a high turbidity of 20.0 to 39.0 mg/L and ranks first among the globe's rivers for the volume of silt in the water. The river, throughout the middle and lower currents, represents a series of channels separated by chalk and small sandy islands, as illustrated in [Figure 18](#) for the area in the Republic of Karakalpakstan.
169. The river flows from northeast to west in a direction close to latitudinal. According to the Gurlen State Gauging Station⁵², water flow along the Amudarya River fluctuates greatly depending on the time of year:
- Average annual flow is 31 m³/s.
 - Maximum average monthly river flows occur in April and reach 190-220 m³/s.

⁵² <https://monitoring.meteo.uz/ru/map/regions/horezmskaja-oblast>

- Minimum average monthly river flows occur in October, amounting to 8.5 m³/s.



Figure 18: Amudarya River's Delta near Nukus city
(Source: Google earth)

170. The river flows at different speeds and has different longitudinal gradients in these branches. The river water is highly mineralized with sulfates, chlorides, magnesium, calcium, and sodium salts. The highest water mineralization of the river was recorded as 1,265.0 mg/l at the Mezhdurechenskoe Reservoir and 1182.0 mg/l at the Tuyamuyun water facilities. The intra-annual streamflow alteration of the river is characterized by two distinct periods: flooding in April and low water from August to October.
171. For the last decade, the project area has faced a water deficit, particularly during the vegetation season when the need for water resources is many times higher than at other times. Due to the Amudarya River's peculiarities, the deficit's central peak occurs in April-May and through the summer. The Uzhydromet Agency⁵³ reported that in 2021, the peak of the deficit was caused by low river water due to little snow, dry winter, low precipitation in the spring, and high air temperatures. In 2022, the river flow was much higher. Still, due to water withdrawal downstream, including filling reservoirs severely affected by the drought of 2021, the water deficit reached almost 70% of the water withdrawal limit in the lower reaches. The last fifteen years have been considered low water in the river delta: the waters of the Amudarya River reach the Nukus city area much less, resulting in the situation when Tuyamuyun reservoirs cannot accumulate water resources. Since February 2021, the volume of water in reservoirs has never exceeded 4 km³, which is less

⁵³ <https://kun.uz/ru/news/2022/08/16/nizovya-amudari-istrytyvayut-ostryy-defitsit-vody-eksperty-govoryat-o-mertvyx-obyemax>

than the amount of water in Tuyamuyun reservoirs in the summer of July 2019. For most of the last one and a half years, the volume of water has been less than or equal to the dead volume. The negative trend is primarily caused by climate change, irrational water use, and increased water withdrawal from river tributaries and watersheds.

172. Almost eighty percent of the Amudarya River is regulated by more than 35 water facilities and a series of canals on the lower Amudarya River diverting water to Uzbekistan. In the project area, the water of the Amudarya River is also diverted into two canals – Canal Doslyk (former the Kizketken Canal) and Canal Kattagar (or Anasaioir Canal).
173. The Doslyk Canal runs through the center of Nukus city, while the Kattagar Canal flows along the city's western border. Kattagar Canal is more than 2.3 km from the project site, while Doslyk Canal is about 276 m as illustrated in [Figure 19](#). The waters of both canals are muddy, matching the quality and color of the Amudarya River water.



Figure 19: Distance to the Canals
(Source: Google earth)

174. The Doslyk, also known as the Kyzketken Canal, is a major canal located in the Republic of Karakalpakstan. It was constructed in 1919, following its extension from 1926 to 1935; the most recent canal modernization work was carried out in 1959-1965 during the Soviet period. The canal draws water from the Amudarya River and extends 25.2 km in length. The canal has a maximum capacity of 500 m³/s. In 1994, the average water flow dropped to 128 m³/s. The canal reaches a 5 m depth. Its waters nourish the lakes Dautkul and

Maukul. The canal irrigates approximately 130.2 thousand hectares of land across Nukus, Kegeyli, Chimbay, Bozatau, Takhtakupyr, and Karauzyak districts, flowing through the Nukus city along its route.

175. There are three lakes near Nukus – Lake Shshikol, Lake Qoskol, and Lake Quadrat (Figure 20). However, they are sufficiently far from the project site to be affected by its activities. The closest lake is approximately 3.2 kilometers east of the site, while the other two lakes are located more than eight kilometers to the east and southeast.

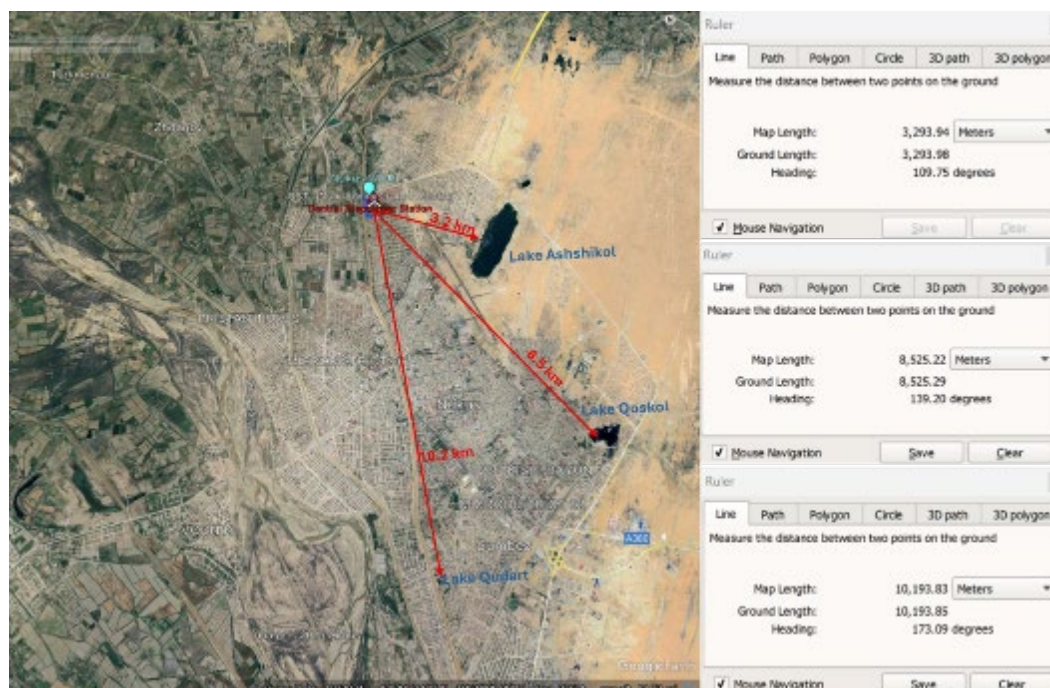


Figure 20: Lakes around Nukus city
(Source: Google earth)

4.1.8. Air Quality

176. Air quality monitoring in Nukus is conducted by three weather stations – Figure 21:
- Weather Station No.5 is located on Berdakh Avenue and measures levels of sulfur dioxide and nitrogen dioxide in the ambient air.
 - Weather Station No. 7 is situated in the Kyz-Ketken community, in the southern part of Nukus. It monitors sulfur dioxide, nitrogen dioxide, and particulate matter in the ambient air.
 - The Beta Weather Station is located on Almazar Street in Nukus City. This station tracks more than seven indicators in the ambient air, including PM 2.5, PM 10, carbon monoxide, sulfur dioxide, nitrogen oxides, nitrogen dioxide, and ozone.
177. The monitoring indicators include nitrogen dioxide, carbon monoxide, sulfur dioxide, ozone, PM2.5, and PM10, as illustrated in Figure 21 and highlighted in green. The measurements are conducted daily and disclosed publicly on the Uzbek

Hydrometeorology Agency's website. The measurements on 26.03.2025 show no changes from the standard requirements ([Section 2.4.1](#)).

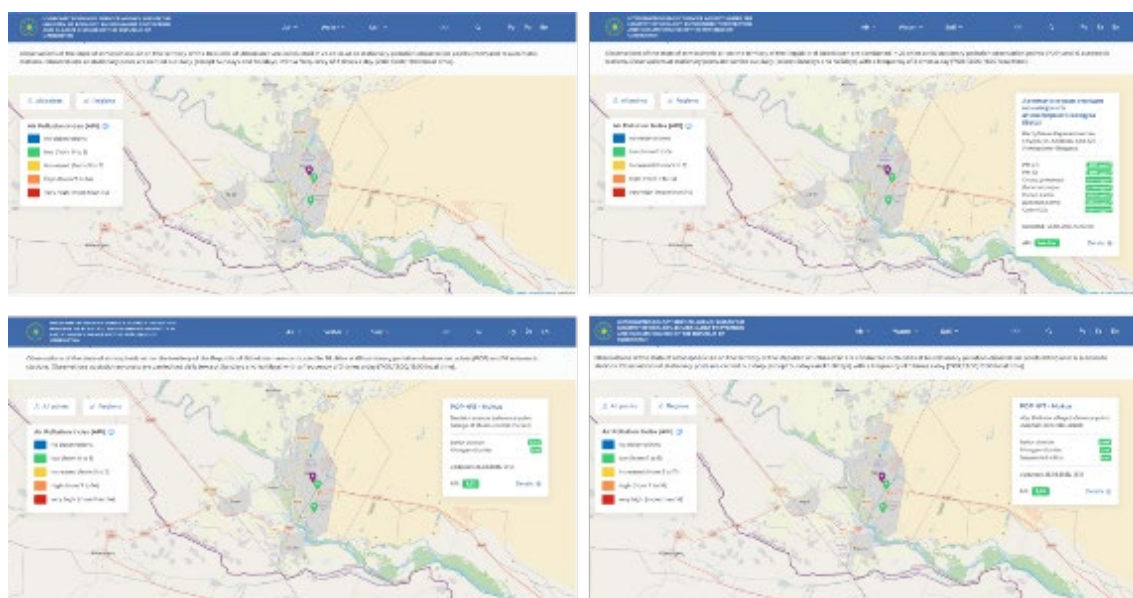


Figure 21: Weather Stations in Nukus city
(Source: [Hydrometeorology Agency](#))

4.2. Biological Environment

178. The project site is inside the fenced facility, where most of the land is paved and a minor part is planted by several fruit trees of various ages:
- Three apricot trees of 30-year-old and three apricot trees of four years-old are south of the building.
 - One apricot tree of about 20-year-old and one timber tree of about 30-year-old in are north of the building.
 - About four apricot trees of 10 to 30-year-old, several timber trees of ten-year-old, and several rose bushes are east of the building and adjusted to the fence.

The reconstruction of the project building will not impact on the trees or vegetation surrounding the building.

179. Most of the area around the fenced water utility territory is an urban-built environment or occupied by sparse natural vegetation, comprising typical to the region, i.e., ephemeral plants, camel thorns, and sagebrush, and salt crusts.
180. Directly across the Nukus-Chimbay highway, there is idle land covered by natural rare vegetation typical. The land is free from residential or public buildings, but is partially occupied by a greenhouse, about 200 sq. m. The idle land borders the fenced Allaniyaz Kahraman Garden to the east. The distance from the dispatcher station building is approximately 114 m, and the distance from the water utility fence is about 64 m. The site's immediate surroundings are illustrated in [Figure 7](#).

181. No free access is available to Doslyk Canal. There is a fence between the project building and Nukus WDU, bordering Doslyk Canal.



Figure 22: Paved Area and Apricot Trees near Project Building
(Source: PMC's Site Visit, March 2025)

182. Considering high anthropogenic activity in the project area, no wild flora and fauna were recorded during site visits except for the *Passeriformes* and *Charadriiformes* bird species. However, significant conservation areas and important bird habitats are located much further north of Nukus.
183. A flora and fauna map of the Republic of Karakalpakstan is shown in [Figure 23](#).

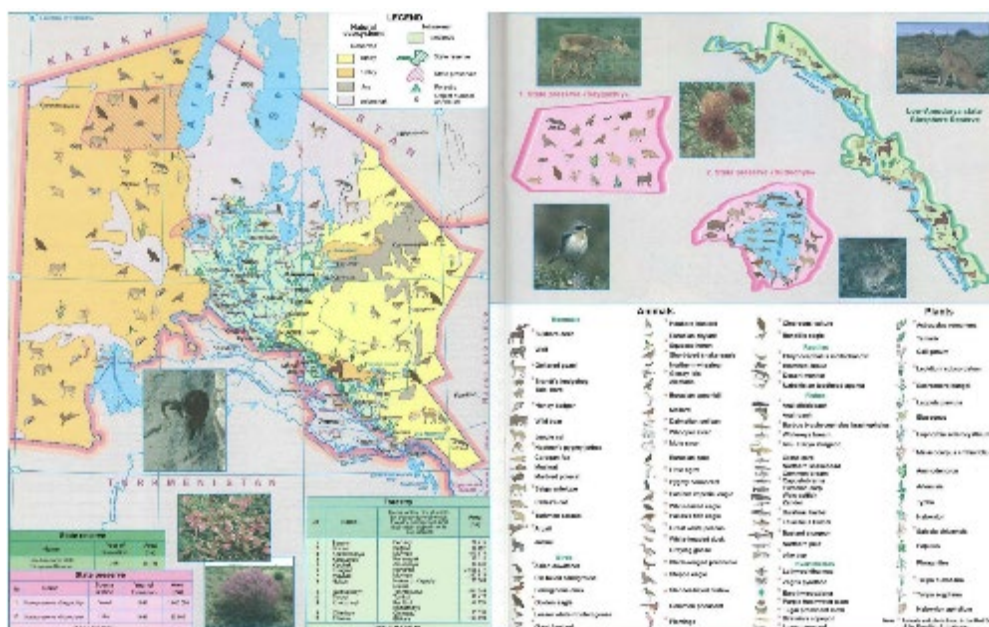


Figure 23: A flora and fauna map of the Republic of Karakalpakstan
(Source: National Atlas of Uzbekistan)

4.3. Socioeconomic Conditions

184. The economy of the Republic of Karakalpakstan was once heavily reliant on the fisheries of the Aral Sea. Today, it is predominantly supported by agriculture, particularly the cultivation of cotton, rice, and some fruits that are suited to the area's saline soils. Additionally, the republic is rich in natural resources such as oil and natural gas, and there are ongoing explorations by foreign and national mining and design organizations.
185. Historically, this region has been a crossroads of civilizations, influenced by empires such as the Persian, Russian, and Soviet, which has contributed to its cultural diversity and historical significance. Its strategic location near Kazakhstan, Turkmenistan, and Uzbekistan makes it an important hub in Central Asia. This position has a substantial impact on regional collaboration, trade routes, and transportation networks, with Nukus city serving as the center of the Karakalpak Republic.
186. The [government reported](#) that as of 2022:
- Gross Domestic Product (GDP) of the region for the five years increased by 32% to UZS26.3 trillion, industrial production has increased from UZS6.8 trillion to UZS16.6 trillion (30% growth).
 - Agricultural production increased by 20%, from UZS5.0 trillion in 2017 to UZS12.3 trillion in 2021. The number of operating enterprises in the region increased by 59% from 19.2 thousand in 2017 to 27.4 thousand in 2021.
187. The Statistics Agency⁵⁴ under the President's Office of Uzbekistan reported the following socioeconomic conditions for the project area:
- As of 2024, the population of Nukus is 339,200, with the number of women slightly exceeding that of men, totaling 171,400. The overall population growth rate is approximately 1.2%.
 - The population density in the city of Nukus is 1,535.1 people per square kilometer as of 2024.
 - The average wage in Nukus at the end of 2023 is UZS 4,314,801.70.
 - The employment rate in the Republic of Karakalpakstan is 62.9%.
 - There are 9,300 unemployed individuals in the Republic of Karakalpakstan.
 - Literacy rates for the adult population were at 100%, and the secondary school enrollment rate for children aged 7 to 14 was also 100%. As of 2023, there were 752 middle schools and 590 preschool organizations in the Republic of Karakalpakstan.
 - There were 12 higher educational institutions in the Republic of Karakalpakstan. In 2023, a total of 12,863 individuals graduated from these institutions, with women comprising 6,355 of the graduates.

⁵⁴ www.stat.uz

- The majority of the population belongs to the Karakalpak ethnic group, followed by Uzbeks and Kazakhs. Other minority ethnic groups include Turkmens, Russians, Tatars, and others.
- The language was written in a modified Cyrillic script during Soviet times and has been written in the Latin alphabet since 1996.
- In addition to the capital, Nukus, major cities include Khojeyli, Takhiatash, Shimbay, Kungrad, and Muynak.

4.4. Cultural Heritage

188. The city of Nukus is located on the site of the ancient settlement of Shurcha. Archaeologists believe that this settlement emerged in the 4th century BC and existed until the 4th century AD. Today, this area serves as a cemetery. Historical data indicates that the settlement was one of the defensive structures protecting the borders of the ancient Khorezm state and controlling the waterway along the Amu Darya River.
189. In the 1860s, a village named Nukus was established on this site. The name *No'kis* in Karakalpak refers to one of the Karakalpak clans and traces back to the ancient name of the Amu Darya River, which was known as *Oks* or *Oxus*. The river's Greek name was *Oxos*, and its Latin name was *Oxus*. The earliest mentions of Nukus as a military fortress date back to the 12th century; however, the original structures from that time have not survived.
190. The project building is inside an urban-built area fenced and having restricted access. The distance to the closest cultural heritage site, a mosque, is about one kilometer. The other cultural sites are more than 2.5 km and comprises two old cemeteries (Shorcha cemetery and Salmen Ata cemetery), a mosque of Mukhamad Sadik Yusuf, and museum after Savitsky.

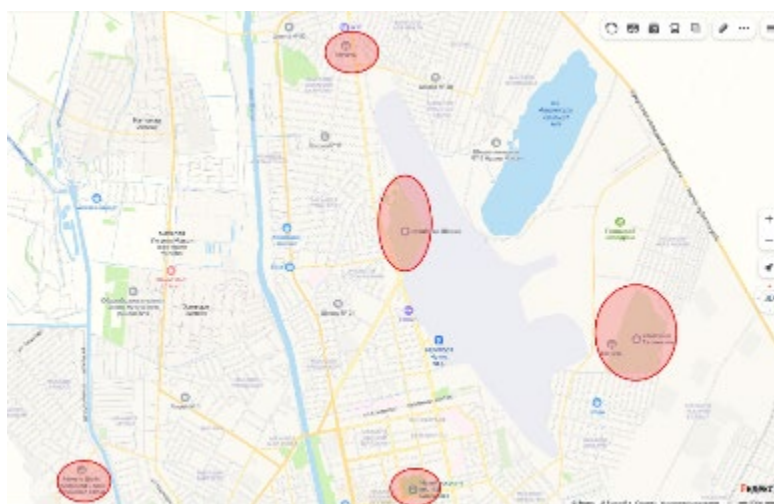


Figure 24: Some Cultural Heritage Sites in Nukus
(Source: YandexMap)

5. ANTICIPATED ENVIRONMENTAL IMPACTS

191. The environmental impacts of the project were identified by assessing the project design and the activities expected to take place during both construction and operation. The identification of these impacts was based on findings from field visits, results of stakeholder consultations, and information gathered from meetings with the water utility, as well as secondary data from various sources and reports.

5.1. Anticipated Benefits of the Project

192. The proposed SCADA facility is anticipated to offer significant benefits to the water utility and its personnel by enhancing their skills by installing a digital hydraulic monitoring system and installing leakage detection equipment. Additionally, support will come from using vehicles, furniture, computers, and other essential tools. The water utility staff will be able to improve their knowledge and skills through training courses provided by the contractor. Furthermore, the renovated building will create a safe, comfortable, and conducive environment for operations and learning.

5.2. Pre-construction Phase

193. During the pre-construction phase, several factors can affect the effectiveness of environmental safeguards throughout the entire project cycle and may result in noncompliance with requirements. These factors include: (i) the failure to include environmental requirements in the bidding documents and contracts, (ii) not obtaining the necessary permits, and (iii) purchasing goods, techniques, and machinery that do not comply with the ADB Prohibited Investment Activities List.
194. Since the project site is located in an active seismic zone, the design includes enhancements to the building structure. These measures will involve (i) installing steel braces and applying cement to both the inner and outer walls of the foundation and (ii) performing concrete work in the blind area surrounding the foundation, ensuring that it is at least one meter wide to function as a base isolation technique. Additionally, the contractor will use construction materials that are resistant to saline soil.
195. The project will utilize the existing land and building. Therefore, no land acquisition is necessary, and all activities will occur within the existing structure.

5.3. Construction Phase

196. The environmental impacts during repair of the Central Dispatcher Station building are considered site-specific, minor, and reversible.

5.3.1. Land Erosion and Surface Disturbance

197. No excavation or earthwork is foreseen by the subproject design. Therefore, no land erosion and surface disturbance impacts are anticipated during construction period.

5.3.2. Impact on Air Quality

198. During the construction stage, the primary impact of the subproject on air quality will be the increase in dust emission during removing wall plastering and old roofing material and flooring cleaning. The application of tile adhesive, paints, and other products used during construction provide point sources of volatile organic compounds (VOCs) and other irritating chemicals. These respiratory irritants do not go beyond the construction site but can affect the contractor personnel.
199. The following measures are foreseen:
- The contractor will implement dust prevention measures such as watering roads near the residential areas and watering dry, exposed surfaces, and stockpiles of aggregates.
 - The contractor will equip all its personnel with PPE to prevent dust from impacting on the workers' health.
 - The contractor will cover loose and fine materials (e.g. sand and fine aggregates) when being transported on trucks and store piled at the site.
 - The contractor will use vehicles and other construction equipment such as diesel generators complying with applicable national legislation regarding emissions and carry out regular maintenance of machinery and equipment. The contractor will use vehicles, plant, and equipment meet Euro-4 standard as required by Uzbek legislation⁵⁵. The contractor will regularly inspect and document the exhaust emissions from construction equipment to minimize unnecessary idling. In addition, the contractor will ensure that a drip tray is placed under the mobile generators, capable of collecting 110% of the oil and fuel.
 - The contractor will store hazardous materials with potential gas emissions in sealed containers and will use them in well-ventilated and secure low-risk areas.
 - The contractor will seal cement and other fine materials after use or put them in containers with lid; concrete batching plants will be located away from sensitive receptors.

5.3.3. Impact on Acoustic Environment

200. No equipment producing loud noise will be used during construction work. However, some noise could occur during drilling, using jackhammers, and other equipment when removing old plastering, flooring, and roofing materials. Construction workers talking, shouting, or

⁵⁵ Decree of the Cabinet of Ministers of Uzbekistan "About improvement of the environmental certification of vehicles and mobile equipment," <https://mintrans.uz/ru/news/2022-yildan-ba-zi-toifadagi-transport-vositalarini-olib-kirish-sotish-va-ulardan-foydalanish-man-etiladi>

using tools can also contribute to the overall noise level. As this will be a temporary phase, no significant impact is expected.

201. It is anticipated that noise from using powered mechanical equipment on site and the haulage of construction materials during the building renovation will cause a nuisance to the noise-sensitive receivers. Noise-emitting construction activities will include removing old materials, installing new ones, operating construction vehicles and equipment, and loading and unloading coarse aggregates. [Table 17](#) outlines the equipment and machinery that will be likely used during the subproject, along with the corresponding noise levels produced during their operation.

Table 17: Equipment and Machinery and their Noise Level

No.	Equipment Type	Application	Noise level, dB
1.	Drill (including hammer drills)	creating holes in various materials	100
2.	Cement mixer	mixing concrete	84-96
3.	Circular saw	cutting wood, metal, and other materials	80-120
4.	Hand hammer	driving nails, removing fasteners, and breaking concrete	120
5.	Floor sander	smoothing surfaces	80-90
6.	Mobile Generator, 50 kVA	energy supply	74-76
7.	Tipper Trucks	transporting materials	95-100
8.	Truck-Crane	lifting and moving heavy materials	67-87

202. Sound from construction equipment can travel significant distances, with its reach influenced by the type of equipment used, the surrounding environment, and the noise levels generated. The intensity of sound decreases by approximately five to six decibels for every doubling of distance from the source. The noise area of influence (Aoi) extends 500 meters on either side of the project building. This area has been surveyed to identify the presence of noise-sensitive receivers (NSR). As mentioned earlier, the project building is located within the water utility's fenced territory along with other facilities, such as:

- main office building of the water utility in the south of the site
- Nukus WDU in the west of the site
- garage, warehouses, and workshops in the north of the site.

203. [Figure 25](#) illustrates the project site and its immediate surroundings, including NSRs.



Figure 25: the project site and its immediate surroundings
(Source: Survey outputs)

204. Table 18 lists the NSRs, including their types and distances from the site. It also provides an overview of the NSRs' locations and discusses how the acoustic environment of the project site could affect them.

Table 18: Closest NSR Types and Distance to the Site

No.	NSR	Receptor type	Distance to the site, m	Brief assessment
1.	Allaniyaz Kahraman Garden	biological	114	- The receptor is located within the Aol, just east of the site across the highway. - The garden is considered as amenity spaces where noise levels are typically desirable to be kept lower than in other, less sensitive areas. Gardens often serve as spaces for outdoor recreation and relaxation. - On the other hand, gardens also act as sound deadeners, primarily due to the absorption properties of plants. The varied shapes and sizes of leaves, and the porous nature of plant material, help to break up and absorb sound waves, reducing their ability to bounce around and be heard.
2.	Permanent residential area – Allaniyaz	human	210	The receptor is located within the Aol and to the northeast of the site.

No.	NSR	Receptor type	Distance to the site, m	Brief assessment
	Kahraman community to the northeast of the site			- Residential areas are considered noise-sensitive receivers. They are more susceptible to noise disturbances due to the nature of their activities and the expectation of quiet and peaceful environments. - The Allaniyaz Kahraman Garden occupies approximately 175,000 sq. m. and acts as a sound deadener for this residential area. The foliage, including stems, leaves, branches, and bark, can absorb sound waves, reducing noise levels, including noise coming from the site.
3.	Permanent residential area – Allaniyaz Kahraman community to the southeast of the site	human	370	- The receptor is located within the Aol and to the southeast of the site. - Residential areas are considered noise-sensitive receivers. They are more susceptible to noise disturbances due to the nature of their activities and the expectation of quiet and peaceful environments. - The Allaniyaz Kahraman Garden is located just across the road from the site, and the Allaniyaz Kahraman community surrounds the garden. The garden occupies approximately 175,000 sq. m. and acts as a sound deadener for this residential area. The foliage, including stems, leaves, branches, and bark, can absorb sound waves, reducing noise levels, including noise coming from the site.
4.	Permanent residential area – Kutli-Konis community	human	370	- The receptor is located within the Aol and to the south of the site. - Residential areas are considered noise-sensitive receivers. They are more susceptible to noise disturbances due to the nature of their activities and the expectation of quiet and peaceful environments. - Kutli-Konis community is located on the eastern bank of Canal Doslyk. A large body of water like Canal Doslyk can create a physical barrier that might reduce sound transmission over long distances, including noise coming from the site.
5.	Secondary School #52	human	400	- The receptor is located within the Aol and to the northeast of the site. - Schools are considered sensitive noise receivers, and they are particularly vulnerable to the negative impacts of noise pollution, such as interference with learning and potential long-term health effects. Noise can disrupt classroom activities, making it difficult for students and teachers to focus and learn effectively. - The Allaniyaz Kahraman Garden is just across the road from the site. It is also between the site and Secondary School #52 and could serve as a natural sound barrier,

No.	NSR	Receptor type	Distance to the site, m	Brief assessment
				including for the noise level coming from the site.
6.	Permanent residential area – Kutli-Makan community	human	540	- The receptor is located outside the AoI and to the north of the site. - Residential areas are considered noise-sensitive receivers. They are more susceptible to noise disturbances due to the nature of their activities and the expectation of quiet and peaceful environments. - The Allaniyaz Kahraman Garden occupies approximately 175,000 sq. m and is located just across the highway. The garden could act as a sound deadener for the Kutli-Makan residential area – the foliage, including stems, leaves, branches, and bark, can absorb sound waves, reducing noise levels. In addition, the Kutli-Makan community is located on the eastern bank of the Doslyk Canal, which will serve as a physical barrier that might reduce sound transmission over long distances, including noise coming from the site.
7.	Permanent residential area – Ulgili-Makan community	human	695	- The receptor is located outside the AoI and to the west of the site, across from the Doslyk Canal. - Residential areas are considered noise-sensitive receivers. They are more susceptible to noise disturbances due to the nature of their activities and the expectation of quiet and peaceful environments. - A large body of water like Canal Doslyk can create a physical barrier that might reduce sound transmission over long distances. Ulgili-Makan community is located on the western bank of Canal Doslyk.
8.	Mosque	cultural	928	- The receptor is located outside the AoI and to the east of the site. - A mosque is typically regarded as a noise-sensitive environment, particularly concerning external noise sources. While sounds produced within a mosque, such as during prayers or the recitation of holy texts, are not usually considered a noise nuisance, external noise can significantly impact the ability to hear the call to prayer or conduct prayers effectively. - The Allaniyaz Kahraman Garden occupies approximately 175,000 sq. m and located between the site and a mosque. The garden could act as a sound deadener for this residential area – the foliage, including stems, leaves, branches, and bark, can absorb sound waves, reducing noise levels.
9.	Secondary School #8	human	1,196	The receptor is located outside the AoI and to the southeast of the site.

No.	NSR	Receptor type	Distance to the site, m	Brief assessment
				- Schools are considered sensitive noise receivers, and they are particularly vulnerable to the negative impacts of noise pollution, such as interference with learning and potential long-term health effects. Noise can disrupt classroom activities, making it difficult for students and teachers to focus and learn effectively. - The Allaniyaz Kahraman Garden is just across the road from the site. It is also located between the site and Secondary School #8 and could serve as a natural sound barrier, reducing the noise level coming from the site. In addition, the school is separated from the site by the residential area of the Allaniyaz Kahraman community. Such a considerable distance could significantly reduce noise transmission from the site.
10.	Cemetery Shorsha	cultural	2,100	- The receptor is situated outside the Aol and is located to the southeast of the site. - A cemetery is typically considered a noise-sensitive area because it is intended to provide a peaceful and quiet environment. This tranquility is especially important for visitors who come to mourn or reflect. Unnecessary noise can disrupt the cemetery's intended purpose and hinder visitors' ability to find solace and peace during their time there. - However, the cemetery is located far from the site and is separated by the Allaniyaz Kahraman Garden and two communities – Allaniyaz Kahraman and Uzyn-Kol.
11.	Workers of the water utility's main office and other facilities	human	40-225 m	225 m to the main office 45 m to garage 40 m to the water reservoirs of Nukus WDU 85 m to the workshops and warehouse - Water utility employees will be direct recipients of the noise produced during the facility's repair, considering their proximity to the site.

(Source: Google Earth's measurement system)

205. Of the 11 nearby sensitive receptors (NSRs) listed, both Allaniyaz Kahraman Garden and the water utility workers will be affected by noise disturbances from the project activities due to their proximity to the site.
206. Below are calculations of the expected noise levels at certain distances from the noise source generated by equipment and machinery specified in [Table 17](#). The calculations were based on the inverse-square law, which states that as the distance from a sound source doubles, the noise level decreases by approximately six decibels.

Table 19: Expected Noise Generation by Equipment and Machinery

Receptor (Table 18)	Distance (Table 18)	Standard, daytime (Table 4)	Noise level generated by equipment and vehicles (Table 17), dB							
			Drill	Cement mixer	Circular saw	Hammer	Floor sander	Mobile Generator	Tipper Truck	Truck-Crane
Allaniyaz Kahraman Garden	114	55	61.02	57.02	81.02	81.02	51.02	37.02	61.02	48.02
Permanent residential area – Allaniyaz Kahraman community to the northeast of the site	210	55	44.64	42.64	34.64	57.64	47.64	33.64	47.64	44.64
Permanent residential area – Allaniyaz Kahraman community to the southeast of the site	370	55	41.51	39.51	31.51	54.51	44.51	30.51	44.51	41.51
Permanent residential area – Kutli-Konis community	370	55	41.51	39.51	31.51	54.51	44.51	30.51	44.51	41.51
Secondary School #52	400	35	31.89	29.89	21.89	44.89	34.89	20.89	34.89	31.89
Permanent residential area – Kutli-Makan community	540	55	39.41	37.41	29.41	52.41	42.41	28.41	42.41	39.41
Permanent residential area – Ulgili-Makan community	695	55	38.01	36.01	28.01	51.01	41.01	27.01	41.01	38.01
Mosque	928	55	36.41	34.41	26.41	49.41	39.41	25.41	39.41	36.41
Secondary School #8	1,196	35	35.01	33.01	25.01	48.01	38.01	24.01	38.01	35.01
Cemetery Shorsha	2,100	55	31.89	29.89	21.89	44.89	34.89	20.89	34.89	31.89
Workers of the water utility's main office	40	55	53.82	51.82	43.82	66.82	56.82	42.82	56.82	53.82

(Source: Survey outputs)

207. Site workers will also experience varying levels of noise depending on their specific roles and the activities being conducted. If no mitigation measures are implemented, the noise impacts on the workforce could lead to health issues, including hearing damage.
208. Construction activities can lead to vibrations that negatively impact communities and the environment, causing structural damage, health problems, and ecological disruptions. Vibrations from construction equipment can cause cracks in walls, foundations, and other structural elements of nearby buildings during networks construction in the populated settlements. Even without structural damage, vibrations can be a significant source of discomfort and annoyance for residents. Prolonged exposure to vibrations can lead to stress, sleep disturbances, and even cardiovascular problems, tinnitus, and hearing loss, that can be experienced by workers during their jobs.

209. Although the noise and vibration generated by general civil work will be during regular working hours (i.e., 07:00 to 19:00 hours on any day, not a Sunday or public holiday), noise levels will not exceed the standards specified in [Table 4](#).
210. The building repair is expected to take 12 months. Since the project design does not involve earthwork or the use of heavy machinery, the resulting noise and vibration impacts will be localized, short in duration, and from moderate to low in magnitude and sensitivity. Additionally, the presence of timber and fruit trees around the project site, along with Allaniyaz Kahraman Garden and Canal Doslyk, will act as sound barriers. Therefore, the noise and vibration impact on nearby NSRs is anticipated to be moderate or insignificant.
211. However, the following measures are provided to mitigate noise impact:
- The contractor will use low-noise equipment and machinery. There is no getting around the fact that construction equipment can be loud, but there are ways to choose quieter equipment. A general rule of thumb is that electronic-powered equipment is quieter than diesel and hydraulically powered equipment is quieter than pneumatic power. Moreover, to mitigate and decrease noise levels, the contractor should properly maintain and lubricate machinery and equipment (e.g., oil bearings).
 - The contractor will limit engine idling to a maximum of one minute. Most construction noise originates from internal combustion engines. Much noise is emitted due to the air intake and exhaust cycle. Specifying adequate muffler systems can control much of the engine noise.
 - The Contractor will install an acoustic screen during noisy activities to ensure the noise level in the area is no more than 70 dB. Employing shields that are physically attached to the particular piece of equipment is effective, particularly for stationary equipment and where considerable noise reduction is required.
 - The Contractor will limit vehicles' speed to 60 km/h to mitigate noise produced during materials transportation. This should also be supported by spreading out the material, spoil, and waste transport schedules.
 - To comply with occupational health and safety standards, the contractor will provide all its workers with effective Personal Protective Equipment (PPE). Earmuffs and earplugs are the most common types of PPE. Increased protection can be achieved by wearing earplugs and earmuffs together.
 - The contractor will take several measures to minimize vibrations from the equipment. These measures include (i) using anti-vibration mounts to isolate the vibrating equipment and reduce the transmission of vibrations to surrounding structures, (ii) employing damping materials to absorb and dissipate vibrations, (iii) installing vibration barriers to block the passage of vibrations, and (iv) modifying construction techniques to generate less vibration, such as using quieter methods for demolition or piling.
 - The Contractor will conduct noise monitoring during the active repair activities.
 - Grievance redress mechanism will be used to record, investigate, and respond to any complaints related to subproject activities. The impacted receptors will have

access to make any complaints regarding noise during the construction phase. An investigation of the complaints will be undertaken by the PMC and PCU.

5.3.4. Impact on Water Resources

212. No quarrying will occur in riverbeds for this subproject. Moreover, there is no access to the Doslyk Canal, which ensures that there will be no alteration to the morphology and hydrology of rivers or canals.
213. No private and community groundwater wells are on the project site. Therefore, no groundwater will be affected by the subproject.
214. Runoff from stockpiled materials and chemical contamination from fuels and lubricants can lead to silt-laden runoff during rainfall, which may cause siltation and infiltration into the soil and groundwater.
215. The following measures will be followed to prevent any possible negative impact on groundwater:
- The contractor will not repair vehicles and equipment at the site or along the road. The contractor will utilize dedicated repair zones with proper containment for handling fuel and oils.
 - The contractor will ensure the warehouse floor is adequately isolated to prevent the infiltration of liquid materials into the soil and groundwater.
 - Drinking water needs for contractor's personnel will be met with tap, bottled, and tankered water, where tap and tankered water will be boiled before consumption.
 - For civil work, water will be delivered to the site using a special water truck, which will also be used to water the area for dust suppression.

5.3.5. Impact of Solid Waste

216. Various types of solid waste will be generated by different construction activities of this project, including excavated materials, construction spoils, domestic waste, and other construction wastes, including hazardous wastes. The construction activities will generate large quantities of excess materials from construction sites (concrete, discarded material, vegetation), demolition of buildings, structures, and other facilities (if any), and waste from construction yards, including garbage, recyclables, food waste, and other debris.
217. In addition, some hazardous waste will also be generated mainly from vehicle maintenance activities (bitumen, liquid fuels; lubricants, hydraulic oils, antifreeze; oily rags, spent filters, etc.). The engineering survey by Specialized Architect and Building Inspection did not find the presence of ACM in the facility ([Section 4.1.3](#)).
218. The following mitigation measures will be implemented:
- The contractor will develop a comprehensive waste management plan that includes separate management strategies for domestic, construction, and hazardous waste. The contractor will train personnel in proper waste disposal practices and procedures.

- The contractor will adopt the 3R approach (reduce, reuse, recycle) to minimize the generation of waste materials. All waste will be segregated, reused, or recycled whenever feasible, and waste containers will be provided at each worksite.
- The contractor will designate suitable areas for the temporary storage of construction and domestic waste within the project site. All hazardous waste generated on-site, including contaminated soil, will be stored properly until collected by the waste management operator. The waste will be transported for disposal in a timely manner, and the contractor will secure a contract with a solid waste management operator.
- The contractor will ensure that all storage containers, drums, and tanks are in good condition and properly labeled. Regular checks for leaks will be conducted to identify potential issues before they arise. Any containers or tanks that are dented, cracked, or rusted may eventually leak and will need to be addressed.
- The contractor is prohibited from incinerating domestic and construction waste at the site.
- The contractor will maintain the site in a clean, tidy, and safe condition and provide adequate facilities for the temporary storage of all waste prior to transportation and final disposal.
- A recording system will be established for all types of waste, including tracking the amounts generated.

5.3.6. Impact on Biological Resources

219. The project site does not include any forest or protected area and is far enough from the ecosystem ([Section 4.1.7](#) and [Section 4.2](#)). No impact is anticipated on the significant conservation areas.
220. Several fruit and timber trees situated near the building may be affected during the removal of the outer wall decoration. The potential impact includes dust emissions and construction waste. The contractor will implement effective waste management practices and will ensure that the trees and other plants adjacent to the building are watered. No trees will be cut down.

5.3.7. Impact on Socioeconomic Resources

221. The project will undoubtedly generate more job and market opportunities. Skilled and unskilled jobs generated by the project will be offered to the local population living near the project site. Additionally, residents can provide services such as catering, machinery and equipment repair, and subcontracting for the main contractor, and providing other paid services.

5.3.8. Community Health and Safety Hazards

222. Considering remoteness of the project building from the residential areas, communities will be minorly exposed to threats due to impacts on their safety, air quality, mobility of

people, goods, and services, economic activities, utility service disruptions, etc. Construction workers may also potentially bring communicable diseases into the community during interaction with residents, subcontractors, or the water utility personnel.

223. Given the nature of the subproject scope, this impact will be indirect in nature, local in extent, medium in magnitude, and short in duration. The following mitigation measures will be implemented:
- The contractor will implement a code of conduct for workers, including restricting workers in designated areas, no littering, no fire, no trespassing, no residence at construction sites, and no obligation to do potentially dangerous work.
 - The contractor will ensure that alcohol and drugs are prohibited on the sites.
 - The contractor will restrict access to the site, through a combination of institutional and administrative controls, with a focus on high-risk structures or areas depending on site-specific situations.
 - The contractor will take measures to prevent the proliferation of disease vectors (including the COVID-19 virus and flu) at work sites through ensuring regular medical checkups of its workers to prevent disease spread into the communities.
 - The contractor will ensure preparedness in emergency response.
 - The contractor will use risk management strategies to protect the local communities from physical, chemical, or other hazards associated with project activities.
 - Liaison with the community will be maintained. Grievance redress mechanism (GRM) will be established to address community grievances related to project activities.

5.3.9. Occupational Health and Safety Hazards

224. Construction activities such as removing old plastering, roofing materials, wall decoration, ceiling materials, old flooring, and other may pose potential risks to construction workers' health, safety, security, and well-being. Other occupational health and safety risks may include exposure to physical hazards from working on heights, and fall hazards, exposure to dust, falling objects, exposure to hazardous materials, and exposure to electrical hazards from the use of tools and machinery.
225. The insufficient supply of safe and potable water, lack of proper sanitation facilities, poor sanitation practices on site, inadequate housing conditions, unsafe handling and operation of construction equipment, mishandling of hazardous substances, exposure to extreme weather, heat waves, and failure to adhere to health and safety measures pose significant threats to the health and safety of construction workers.
226. The following mitigation measures will be implemented:
- The Contractor will follow the national Labor Code for setting a work schedule for its personnel:

- In Uzbekistan, the standard workweek is 40 hours, with a maximum of 7 hours daily in a six-day workweek and 8 hours in a five-day workweek, and employees are entitled to a minimum of 12 hours of daily rest.
 - The minimum duration of annual leave is 21 calendar days.
 - Overtime is calculated at 1.5 times the regular hourly rate for any hours worked beyond the standard 40-hour workweek.
- The contractor will appoint full-time qualified and experienced operational health and safety staff at the site.
- The contractor will carry out job hazard analysis for each type of construction activity, which will result in the provision of specific training activities to the workers, development of permits to work, incident reporting, and root cause analyses systems.
- The contractor will deliver regular training sessions on occupational health and safety aspects.
- The contractor will train all construction workers on (a) equipment and machinery maintenance, (b) specific hazards of their work, (c) first aid, (d) basic sanitation and health care, (e) environmental protection, and (f) GRM. The training sessions will be prior to any project activities.
- The contractor will provide and install awareness-raising materials on occupational health and safety at every construction site.
- The contractor will regularly screen the workers for communicable diseases, including sexually transmitted infections.
- The contractor will ensure the provision of appropriate PPE for all workers and visitors and ensure that PPE is used properly. No worker (or even visitors) will be allowed on the site without the required PPE (earplugs, safety shoes, hard hats, masks, goggles, etc.).
- The contractor will ensure the provision of firefighting equipment at the site, and particularly near the fuel storage.
- The contractor's drivers will maintain a low speed while driving through/near the settlements.
- The contractor will ensure the safety and reliability of all equipment and machinery provided for operation by workers. All electrical equipment will be inspected before it is used to ensure that it is suitable for its purpose. People operating electrical equipment should be thoroughly instructed about any possible danger to the equipment concerned. The contractor will provide proper labeling of equipment and containers at construction and storage sites.
- The contractor will provide first aid appliances for its workers. At every workplace, there should be maintained, in a readily accessible place, first aid appliances, including an adequate supply of sterilized dressing and cotton wool. First aid facilities will be made available at the work sites and in the camps. The contractor will engage a qualified first aider(s). The location and telephone numbers of the nearest hospital will be displayed at appropriate places at work sites and in construction camps.

- No child labor or forced labor will be engaged by the project or its contractors.
- The contractor will maintain an accident management and reporting system.
- The drivers and operators of vehicles and materials handling equipment will be medically fit, trained, and tested and of a prescribed minimum age as required by government rules and regulations.
- The contractor will provide housing, a safe and reliable water supply for all workers. Drinking water needs will be met with safe tap water and bottled water.
- The contractor will ensure proper sanitary facilities for the workers. The sewage and domestic waste will be collected in containers and disposed of regularly. The contractor will provide separate latrines and bathing places for males and females.
- The contractor will provide appropriate security personnel and enclosures to prevent unauthorized entry into the sites and camp areas.
- While working at heights, the contractor will:
 - provide adequate training on equipment use, emergency procedures, and safety protocols
 - use well-maintained ladders, scaffolding, and PPE like harnesses and helmets
 - use balconies or parapets with railings as safe working platforms
 - employ fall protection systems like guardrails, floor coverings, fall restraint systems (harnesses and lanyards), and fall arrest systems (safety lines)
 - ensure unprotected edges are guarded to prevent accidental falls
 - ensure competent supervisors are on-site to monitor compliance and address safety concerns.
- GRM will be used to record, investigate, and respond to any complaints related to project activities.

5.3.10. Impact on Cultural Heritage

227. The subproject will not encroach into, or be near physical, cultural resources. No adverse effects on cultural heritage are expected during construction.

5.4. Operational Phase

5.4.1. Land Erosion and Surface Disturbance

228. The subproject has no earthwork during the operation phase.

5.4.2. Impact on Air Quality

229. During the operation phase, no burning fossil fuels for heating or any other purposes are foreseen. The design specifies that the building will use electric heating.

230. No impact on ambient air quality is anticipated due to the nature of subproject activities during the operation phase – operation and maintenance of the SCADA system and training personnel within the Central Dispatcher Station building.
231. Buildings are a significant source of greenhouse gas (GHG) emissions, mainly due to the energy used for heating, cooling, and lighting. Renovations can worsen this situation if they don't enhance energy efficiency, resulting in higher energy demands and, consequently, increased emissions. After repairs and the introduction of new furniture, energy consumption can rise, further contributing to GHG emissions. This uptick is driven by the energy needed for heating, cooling, and operating new appliances and fixtures.
232. Additionally, indoor air quality may suffer due to off-gassing from new materials, such as furniture, paints, and flooring. These materials can release volatile organic compounds (VOCs) into the indoor environment, which can negatively impact air quality.
233. The mitigation strategies will include:
- Implementing energy-efficient lighting, appliances, and heating/cooling systems by contractor to reduce energy consumption and GHG emissions.
 - Installation of solar panels for power supply by contractor.
 - Using low-VOC paints, flooring, and other building materials by contractor to minimize indoor air pollution.
 - Ensuring adequate ventilation in all rooms of the building to remove pollutants from new materials and excess moisture by the water utility.
 - Maintaining HVAC systems, cleaning air ducts, and promptly addressing any moisture issues to prevent mold and mildew growth by the water utility after building commissioning by the contractor.

5.4.3. Noise Impact

234. No high-level noise emitters are planned to be installed in the building. The subproject will introduce new mechanical systems designed to help minimize noise levels. The only anticipated background noise will come from conversations among water utility personnel and distractions from phones and office equipment, such as printers and copiers. However, the spacious layout of the premises ([Figure 5](#)) will help reduce the transmission of this noise between different areas.
235. During the operational phase, no impact on the acoustic environment is anticipated due to the nature of subproject activities, which will involve the operation and maintenance of the SCADA system and the training of personnel within the Central Dispatcher Station building.

5.4.4. Impact on Water Resources

236. The operation of office building may impact water consumption, primarily through activities such as toilet flushing, handwashing, cleaning, and drinking water. However, the subproject design foresees total replacement of all utility infrastructure in the building and

installation of new equipment, including toilets, faucets, urinals, water dispensers, and other water fixtures in office buildings. Educating employees about water conservation practices can promote responsible water usage.

237. For wastewater management, the project building is connected to the city's wastewater system, which is maintained by the Nukus City Department of QST LLC.

5.4.5. Impact of Waste

238. During the operation of office buildings, managing domestic solid waste can have a significant impact on the environment and public health. However, these impacts can be mitigated through proper waste management practices. Most of the waste generated includes paper, food residues, and liquid waste.

239. To facilitate effective waste management, the water utility will ensure that reusable containers are provided at each worksite. The water utility has a contract with the Nukus solid waste management operator to ensure timely collection and disposal of domestic solid waste. Additionally, personnel from the water utility will be encouraged to minimize waste production by following the 3R approach: reduce, reuse, and recycle. They will be required to segregate waste and, wherever practical, either reuse or recycle it.

240. Waste electrical and electronic equipment can contain hazardous substances and is often classified as hazardous waste. These substances, if not properly managed, can pose risks to human health and the environment due to the presence of heavy metals (like lead, mercury, and cadmium) and flame retardants:

- Mercury, lead, cadmium, and others are found in various components like batteries, circuit boards, and display devices.
- Brominated flame retardants are used in plastics and other materials to make them fire-resistant, but they can be toxic and persist in the environment.
- Lead is found in computer monitors.
- Some batteries, particularly nickel-cadmium (NiCd) and lead-acid batteries, contain hazardous metals.

241. Leaching of hazardous substances from improperly disposed waste electrical and electronic equipment can contaminate soil and water, harming wildlife and ecosystems. Mitigation measures for waste electrical and electronic equipment will include prevention, reuse, recycling, and responsible disposal:

- Prevention: the water utility, PCU, and contractor will ensure procurement of electrical and electronic equipment with longer lifespans and consider their end-of-life disposal by making it easier to disassemble and recycle.
- Reuse: the water utility will repair electronic devices and upgrade their components, such as hard drives or memory, to extend their lifespan; another option will be donation or resale to give used electronics a second life.
- Recycling and Responsible Disposal: In Uzbekistan, waste electrical and electronic equipment is treated and disposed of only by licensed organizations

according to Articles 40 and 41 of [Decree of the Cabinet of Ministers of Uzbekistan #787](#)⁵⁶. The procedure of waste electronic equipment provision for disposal by legal entities like the water utility is stipulated in [Decree of the Cabinet of Ministers of Uzbekistan #425](#)⁵⁷. The procedure of waste lighting equipment disposal of is specified in [Decree of the Cabinet of Ministers of Uzbekistan #266](#)⁵⁸. Hazardous and non-hazardous waste provided for disposal will be properly recorded by the water utility.

5.4.6. Impact on Biological Resources

242. No impact on biological resources is anticipated due to the due to the nature of subproject activities during the operation phase – operation and maintenance of the SCADA system and training personnel within the Central Dispatcher Station building.

5.4.7. Impact on Socioeconomic Resources

243. The SCADA facility is anticipated to offer significant benefits to the water utility and its personnel by enhancing their skills by installing a digital hydraulic monitoring system and installing leakage detection equipment. Additionally, support will come from using vehicles, furniture, computers, and other essential tools. The water utility staff will be able to improve their knowledge and skills through training courses provided by the contractor. Furthermore, the renovated building will create a safe, comfortable, and conducive environment for operations and learning.

5.4.8. Community Health and Safety

244. No impact on community health and safety is anticipated due to the nature of subproject activities during the operation phase – operation and maintenance of the SCADA system and training personnel within the Central Dispatcher Station building.

5.4.9. Occupational Health and Safety Hazards

245. No impact on occupational health and safety is anticipated due to the nature of subproject activities during the operation phase – operation and maintenance of the SCADA system and training personnel within the Central Dispatcher Station building.
246. While radiation from computers and office equipment is not a concern, pregnant women should be aware of potential physical problems like eye strain and back pain that can arise from prolonged screen time. The working conditions of such women will be adjusted following [Article 142 of the Labor Code of Uzbekistan](#).

⁵⁶ Decree of the Cabinet of Ministers of Uzbekistan #787, dd. 02.10.2018, Improvement of Solid Waste Management

⁵⁷ Decree of the Cabinet of Ministers of Uzbekistan #425, dd. 06.06.2018, Improvement of Order for Managing Scrap and Waste of Non-ferrous and Ferrous Metals

⁵⁸ Decree of the Cabinet of Ministers of Uzbekistan #266, dd. 21.09.2011, Approval of Regulation on Collection and Disposal of Waste Mercury-Containing Lamps

5.4.10. Impact on Cultural Heritage

247. No negative impact on cultural heritage is anticipated due to the nature of subproject activities during the operation phase – operation and maintenance of the SCADA system and training personnel within the Central Dispatcher Station building.

6. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

6.1. Consultation Meetings

248. Given the nature of the proposed subproject activities, stakeholder consultations were conducted in October – December 2024 and January – March 2025 with representatives of water utility, CEE, and Specialized Architect and Building Inspection under the Ministry of Construction and Housing and Communal Services of the Republic of Karakalpakstan, PCU, and DD Consultant. The specific interest, relevance and influence of the stakeholders included subproject design, coordination of project activities, environmental management, building condition and a need for engineering survey of the building, discussions over equipment and vehicles list, etc.
249. The meetings with CEE aimed to discuss the environment safeguards aspects of the Subproject #WU-CW-10, the anticipated environmental impacts at the project site, and environmental clearance requirements. During the meetings, the proposed subproject was presented to stakeholders.
250. The consultation meetings included random interviews with several residents from nearby areas and officers from the Central Dispatcher Station. This was done to verify the issues and concerns related to the existing building and collect information about the environmental and social conditions in the area. Stakeholders also discussed the potential positive impacts of the subproject, such as the generation of new jobs and improving personnel work conditions, skillsets, and tools.
251. The objectives of public involvement were to inform stakeholders about the proposed project, provide an opportunity to present their views and values, and provide better transparency and accountability in decision-making, creating a sense of ownership with the stakeholders.
252. The stakeholder consultations addressed the following points:

#	Concerns expressed by stakeholders	How they are addressed
1.	The water utility was concerned whether the detailed design prepared by the DD Consultant for the six districts will be consistent with SCADA configuration and specifications designed by PMC.	A discussion on the SCADA configuration, extent, and specifications was held by PMC, water utility, and the DD Consultant between October 2024 and March 2025, with input from the PMC and the water utility.

		PMC provided analysis of specifications for SCADA to be installed in the project WDUs and networks including recommendations for changing flowmeters specifications and how new information systems will be integrated into the central SCADA system.
2.	During the consultations in November 2024, the water utility management requested modifications to the project design to incorporate building repairs.	PMC conducted a site visit in December 2024 to assess whether the new work scope would fit within the subproject budget. In January 2025, PMC and the water utility reached an agreement on a revised scope for Subproject #WU-CW-10, which included building repair.
3.	During a site visit and consultations with the water utility in December 2024, PMC requested an engineering survey of the building by a licensed organization to ensure the structural engineering complied with the applicable building code.	The water utility hired a Specialized Architect and Building Inspection to conduct engineering surveys of the building to ensure its structural compliance with the applicable building code. On-site verification of the findings and recommendations from the Specialized Architect and Building Inspection was conducted jointly by PMC, PCU, and the water utility in February-March 2025.
4.	PMC also requested land and building ownership documents from QST LLC to confirm that the site is an asset of water utility and that no leaseholders or informal users are present.	QST LLC provided a copy of landownership documents dated 28.01.2022 confirming the building belongs to the water utility. It was also confirmed that no alien organization located in that building.
5.	In March 2025, the need for an EIA for Subproject #WU-CW-10, per applicable Uzbek legislation (Section 2.3.3), was discussed with representatives from the CEE under the Ministry of Ecology, Environmental Protection, and Climate Change of the Republic of Karakalpakstan.	CEE noted that due to the specific work scope associated with Subproject #WU-CW-10, an Environmental Impact Assessment (EIA) is required to confirm the project's category according to local legislation, and no additional permits, certifications, or authorizations are necessary to proceed with the subproject work.

DD Consultant = Detailed Design Consultant, PMC = Project Management Consultant, SCADA = Supervisory Control and Data Acquisition, WDU = Water Distribution Unit, PCU = Project Coordination Unit, EIA = Environmental Impact Assessment, QST LLC = Qoraqalpoq Suv Ta'minoti LLC, CEE = Center for Environmental Expertise

6.2. Information Disclosure

253. The updated IEE with ECP in English will be disclosed on the [ADB website](#).
254. As part of information disclosure, the final IEE with ECP in English and local language (whole report in Russian and Summary in Karakalpak) will be available to public including relevant authorities at the offices of the PCU and QST LLC in the Republic of Karakalpakstan.
255. [Uzsuvtaminot JSC](#) will also posts on its website the whole report in Russian and English languages and a summary in Karakalpak.

7. GRIEVANCE REDRESS MECHANISM

256. A project-specific Grievance Redress Mechanism (GRM) has been established to receive, evaluate, and facilitate the resolution of concerns, complaints, and grievances from individuals affected by the project. This mechanism addresses social, environmental, and other related issues. The GRM is designed to provide a transparent and timely process for handling these concerns and is complied with Law on Appeals⁵⁹ of Individuals and Legal Entities.
257. According to [Article 28 of Law ZRU-445](#)⁶⁰, a complaint is considered within fifteen days of receipt. If additional investigation or verification is needed, a request for more documents extends the consideration period to one month.
258. Grievances can be submitted through a variety of channels, including letters, emails, text messages (SMS), verbal accounts, grievance boxes, and registers. [Table 20](#) illustrates information about grievance-receiving channels.

Table 20: Existing Grievance Receiving Channels

Organization	Location	Contacts
Uzsuvtaminot JSC	Tashkent	Address: Tashkent city, Bogishamol Street, 151A, E-mail: uzst@exat.uz , info@uzsuv.uz Phone: +998 (55) 503-12-55 Hotline: 1255 Telegram: @suvmuamobot; @uzsuv_chat ; https://t.me/uzsuv Website: https://uzsuv.uz
Project Coordination Unit	Tashkent	(i) PCU Head: Mr. Jakhongir Ibrakhimov (ii) PCU's Social and Environmental Safeguards Specialists: Mr. Abbos Tillakhujaev and Mr. Sanjar Esonov (iii) PCU's Water Supply Specialist: Mr. Khonamir Inatullaev (iv) PCU Coordinator in Nukus: Mr. Azamat Saparov Address: Tashkent city, Do'rmon yo'li Street, 5 E-mail: po.adb@uzsuv.uz Phone: +998 55 503 60 15 (ext. 257)
QST LLC – Qoraqalpog Suw Taminoti JSC	Nukus	Address: Nukus city, E. Alakoz ko'chasi E-mail: qoraqalpogiston@uzsuv.uz Phone: +998 61 224 50 46, +998 61 226 51 50 Telegram: @suvmuamobot Website: http://rk.uzsuv.uz
Nukus City Administration	Nukus	Address: Nukus city, A. Dosnazarov Street, 96 E-mail: nukus.q@karakalpakstan.uz , nukus.sh@exat.uz Phone: +998 (61) 222-25-39 Hotline: +998(61) 222-26-14 Telegram: @t.me/nukuspress, @Press_bot_nukus Website: www.nukus.uz

⁵⁹ Law No.ZRY-445 dated 11.09.2017, <https://lex.uz/docs/3336171>

⁶⁰ Amendment to Law on Appealing of Individuals and Legal Entities, #ZRU-445, 11.09.2017

259. The formal project-level GRM will provide three tiers for grievance redress as illustrated in [Figure 26](#).

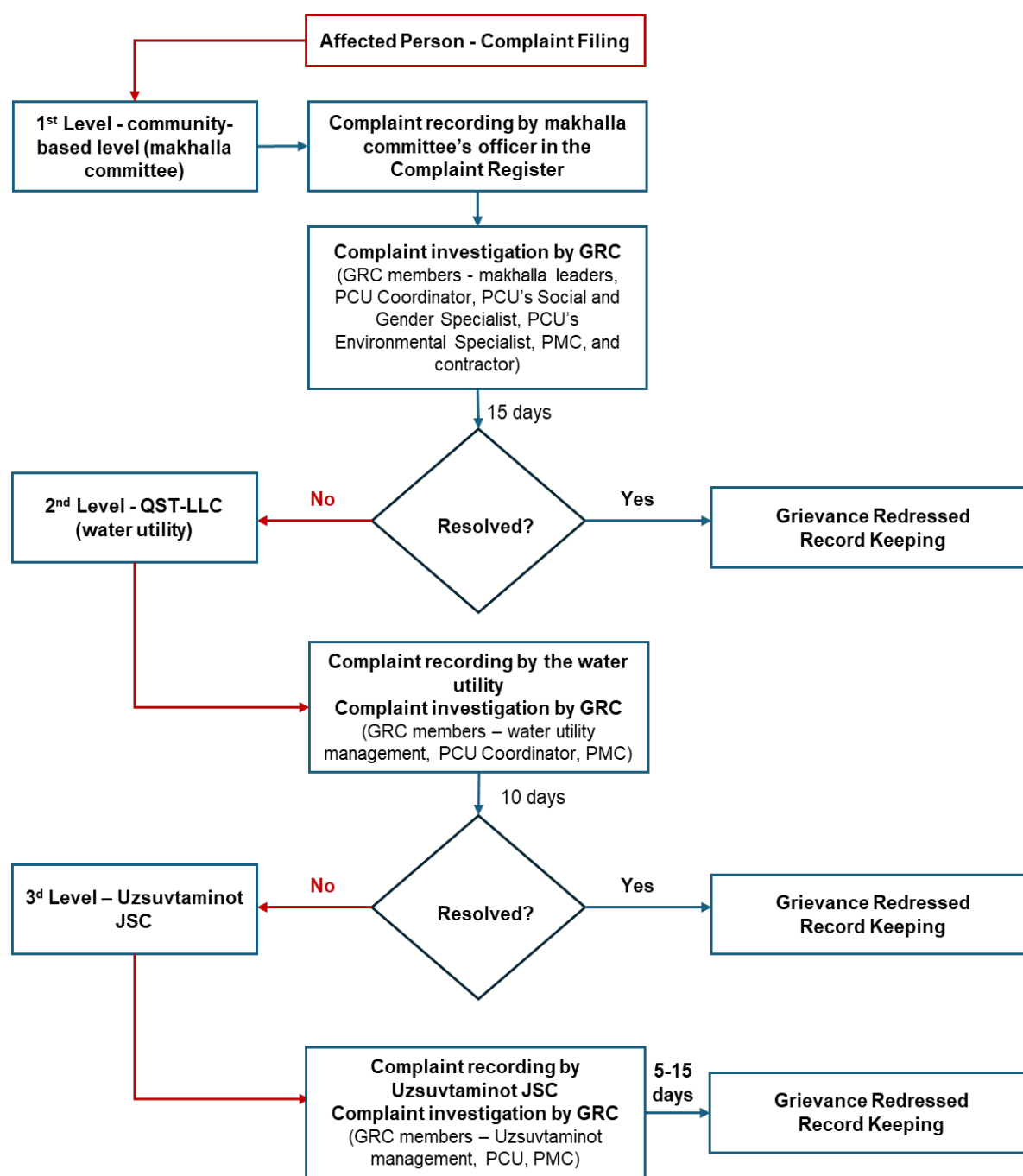


Figure 26: Project-level GRM

260. All complaints will be registered in the Grievance Log available in mahalla committee, QST-LLC (water utility), and Uzsuvtaminot JSC. The Grievance Redress Committee (GRC) will operate at all GRM levels:
- Community-based Level GRC: This committee will consist of makhalla leaders, the PCU Coordinator, the Social and Gender Specialist from the PCU, the Environmental Specialist from the PCU, members of the Project Management Consultant (PMC), and the contractor.
 - QST-LLC Level GRC: Members of this committee will include water utility management, the PCU Coordinator, and the PMC.
 - Uzsuvtaminot JSC Level GRC: This committee will be made up of the management of Uzsuvtaminot JSC, representatives from the PCU, and the PMC.
261. The GRM offers an accessible platform for affected individuals to voice their concerns and seek resolutions. Each grievance will be carefully documented to ensure that the procedures followed for addressing each issue are thoroughly recorded.
262. PCU's Social and Gender Specialist and Environmental Specialist have the overall responsibility for timely grievance redress on environmental and social safeguards issues. The Project Coordinator in Karakalpakstan is the focal person for facilitating the grievance redress at the local level.
263. Public awareness campaigns will be regularly conducted following the project's communication strategy to ensure awareness of subproject progress and its GRM.
264. The formal GRM will provide three tiers for grievance redress as illustrated in [Figure 26](#). The GRM procedure includes the following steps:
- **First Level of GRM** (local community-based level or contractor's field office):
The first level of GRM is the local community-based committee (*makhalla committee*), also known as the makhalla, or the contractor's field office. This level serves as the most accessible and immediate venue for quickly resolving grievances. Individuals with complaints related to the project can contact the makhalla personnel or the Project Coordinator to file a grievance.

Upon receiving a complaint, the *makhalla* leaders will document it promptly and inform the contractor, PMC, and the Project Coordinator. At this GRM level, the GRC will investigate the complaint, meet with the complainant and any relevant individuals, and make a decision. If the grievance pertains to the contractor's activities, the contractor will correct its activities and resolve the issue on-site in a timely manner. Overall, the consideration and resolution of grievance at this level should be completed within fifteen days of receiving the complaint.

The Project Coordinator is responsible for thoroughly documenting the following details: (i) name of the complainant, (ii) date the complaint was received, (iii) nature of the complaint, (iv) location of the issue, (v) resolution of the complaint, along with feedback provided to the complainant.

If the complaint remains unresolved at the local level after fifteen days, the Project Coordinator will escalate the issue to the PCU and QST-LLC.

- **Second Level of GRM (QST-LLC level):**

The complainant will be informed by the *makhalla* committee that their grievance has been forwarded to QST-LLC in Nukus and PCU in Tashkent.

A meeting will be called and chaired by QST-LLC, including representatives from the PCU and PMC. The purpose of this meeting is to develop recommended corrective measures, which may include the collection of additional information within ten days if necessary. Clear responsibilities for implementing the decisions made will be assigned within the next five days.

At any stage of the GRM process, if an issue is not resolved within the specified period or the complainer is not satisfied with the decision, an aggrieved person may submit their grievance to a court at their own cost, where decisions will be made following applicable national legislation.

- **Third Level of GRM (Executing Agency level):**

Any unresolved or significant issues will be referred to Uzsuvtaminot JSC, PCU, and PMC for a final resolution. A decision will be made by Uzsuvtaminot JSC within five to fifteen days of receiving the complaint through its complaint management system and will communicate the final decision to the complainant. The complaint may also submit its grievance using the following channels:

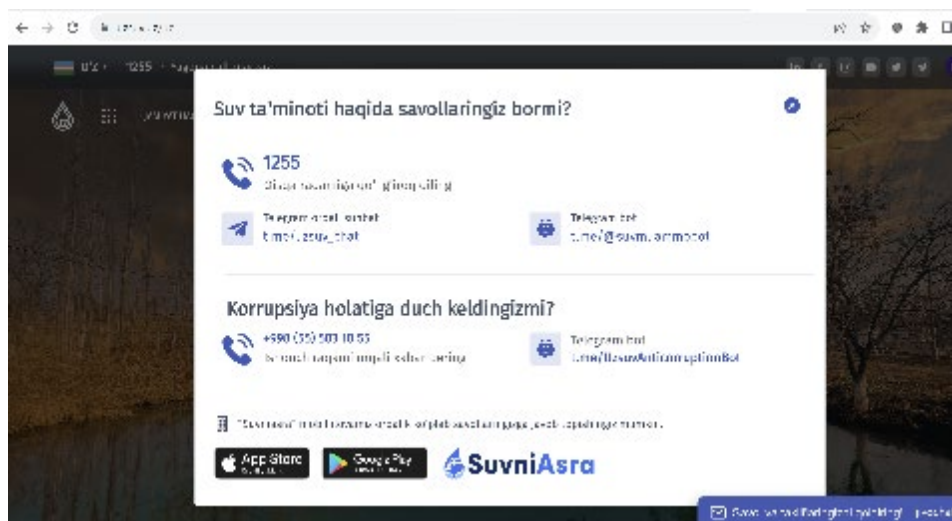


Figure 27: Uzsuvtaminot JSC's Grievance Receiving Channels
(Source: Uzsuvtaminot JSC's website)

265. Despite the project GRM, an aggrieved person has access to the country's legal system at any stage, and accessing the country's legal system can also run parallel to accessing the project GRM.
266. In the event that the established GRM is not in a position to resolve the issue, the affected person also can use [ADB Accountability Mechanism](#) by directly contacting the Complaint

Receiving Officer at ADB headquarters or the ADB Uzbekistan Resident Mission, or [filing a complaint](#) through the web. The complaint can be submitted in any of the official languages of ADB's Developing Member Countries.

267. **Record Keeping and Disclosure.** All paperwork related to grievances will be documented and recorded in a logbook, which will be distributed by PCU and made accessible at all levels, including local community-based offices, contractor field offices, QST-LLC in Nukus city, and Uzsuvtaminot JSC in Tashkent. The PCU will be responsible for forwarding grievances to the appropriate authorities and stakeholders before scheduled meetings, as well as for following up on all escalated grievances.
268. All decisions made regarding grievances will be communicated to the affected people by the PCU's Social and Gender Specialist. This communication will include timely updates to the person who filed the complaint. PCU's Social and Gender Specialist will maintain records of all grievances received, which will include the contact details of the complainant, the date the complaint was filed, the nature of grievance, the agreed-upon corrective actions, the date of the incident, and the outcome.
269. The number of grievances recorded and resolved, along with their outcomes, will be disclosed in PCU's office and the community-based committee. Additionally, these details will be included in the Semi-Annual Environmental Monitoring Reports (SAEMRs) submitted to ADB.
270. For grievances escalating to the QST-LLC level, the Project Coordinator, designated as the GRM focal person, will be responsible for keeping records, organizing meetings, and sharing information promptly with the *makhalla* committee, QST-LLC, PCU, and PMC.
271. For grievances that are escalated to Uzsuvtaminot JSC and higher, the PCU's Social and Gender Specialist will maintain records and send copies to both the QST-LLC and the *makhalla* committee.
272. If complaints are raised directly to the contractor, they will record the grievance and work to resolve the issue at the field level within fifteen days of receiving the complaint. The contractor will inform PMC and the Project Coordinator about the filed complaint and the actions taken, which will be documented in weekly environmental checklists and the environmental section of the contractor's monthly progress reports. If the contractor has not resolved the complaint locally within fifteen days, the Project Coordinator will forward the complaint to PCU and QST-LLC for further consideration and resolution.
273. **GRM for Workers.** PCU's Social and Gender Specialist will establish an independent complaint handling center with a locked "post box" and grievance forms in the construction site to handle construction workers' grievances related to the contractor (timely payment, accommodation, catering, drinking water, PPE, sanitation conditions, medical services, etc.). The grievance box will be checked regularly by PMC and PCU. However, the workers can raise their complaints during the presence of PMC and PCU on the site or send their grievance over the telephone. If the complainant prefers a verbal grievance, the PMC and PCU personnel record and register it following the formal process.

274. The grievance form will be available to construction workers and project personnel in Karakalpak, Uzbek, and other languages. Where the complainant is illiterate, the complaint can be made verbally to PCU and PMC personnel so that they will complete the grievance form on behalf of the grievant. The grievance form will include the complainant's contact details. However, the complainant can also raise grievance anonymously.
275. The PCU's Social and Gender Specialist will (i) take corresponding actions to resolve the grievance and provide the complainant with proper corrective actions report and (ii) continue to monitor the situation until it is finally resolved.

8. MITIGATION MEASURES

276. The anticipated minor impact discussed in [Section 5](#) and small-scale civil work interventions under Subproject #WU-CW-10, outlined in [Section 3.2](#), will be addressed by implementing the Environmental Code of Practice (ECP). The scope of work for this subproject includes the repair of the Central Dispatcher Station building and the installation of the SCADA system. According to the ADB Safeguard Policy Statement (SPS), this subproject is classified as Category C.
277. The ECP, found in [Appendix 6](#), outlines standard practices and procedures for managing potential impacts on the local environment through the following sections:
- (i) ECP 1: Waste Management
 - (ii) ECP 2: Air Quality Management
 - (iii) ECP 3: Fuels and Chemicals Management
 - (iv) ECP 4: Water Resource Management
 - (v) ECP 5: Road Transport and Road Traffic Management
 - (vi) ECP 8: Construction Camp Management
 - (vii) ECP 9: Worker Health and Safety.
278. The ECP will be included in the bidding and contract documents for Subproject #WU-CW-10. The contractor will be informed of this obligation and will bear the cost of ECP by implementing the necessary measures included in the overall construction cost. The ECP will be made available to the project personnel in Karakalpak and Uzbek.

9. SAFEGUARD ROLES AND RESPONSIBILITIES

279. **Executing and Implementing Agencies.** JSC Uzsuvtaminot is the Project's Executing Agency. PCU has been established under JSC Uzsuvtaminot with responsibilities for the project's overall management, implementation, and monitoring. PCU is a focal point for communication with the ADB team on the project. PCU is fully staffed and includes an environmental specialist and social and gender specialists. The main duty of the ES specialists is to ensure that the project activities are implemented in compliance with the ADB SPS, applicable national regulations, and in compliance with the ECP. PCU will facilitate coordination with other project stakeholders, including government agencies,

- local administration, project communities, consultants, and contractors. PCU will ensure the corresponding reporting and activities are made available for the project stakeholders.
280. A Project Coordinator is set up in the Republic of Karakalpakstan to manage day-to-day project implementation at the project and district levels.
281. **PMC.** The Project has PMC on board with responsibilities to monitor, evaluate and report on project activities and ensure environmental compliance. The PMC is staffed with an international environmental specialist and a national environmental specialist to perform properly environmental and social supervision and guidance during the design and the construction.
282. **Project Contractor.** As an integral part of contract compliance, the contractor will be required to implement the ECP throughout contract implementation and submit implementation reports to the PCU. The contractor will appoint an environment, health, and safety (EHS) manager to be responsible, on a day-to-day basis, for ensuring ECP implementation and compliance, coordination with environmental and social safeguards specialists, implementing field-level grievance redress, and ongoing reporting.

10. SAFEGUARDS MONITORING AND REPORTING

283. Construction works will be continually monitored by EHS and other relevant contractor personnel, who will liaise with and report to the PCU and PMC on a day-to-day basis. The PCU will prepare and submit reports to the ADB detailing ECP implementation and compliance as part of the quarterly project progress reports and SAEMR.

11. CONCLUSIONS AND RECOMMENDATIONS

284. The IEE indicates that the project is unlikely to have any significant adverse or irreversible environmental impacts. The project's nature is to repair the existing building without involving any earthwork or significant demolition of infrastructure. The public building design is based on international best practice and is in line with Uzbek legislation. Therefore, the environmental impacts of the project design or location are not expected to be significant.
285. The project design envisions the installation of energy-efficient technologies for lighting, HVAC, and other features, as well as solar panels for power supply. The contractor will be required to use low-VOC paints, flooring, and building materials to reduce indoor air pollution. Additionally, personnel from the water utility will be instructed to maintain HVAC systems and air ducts effectively. With all these measures in place, GHG emissions and energy consumption are expected to be minimal.
286. The anticipated environmental impacts are considered to be low risk and are expected to occur only during temporary renovation activities. Dust, noise, and vibration impacts will be minimal and spread out. Waste generated during the project will be properly segregated

and either recycled or disposed of in accordance with relevant regulations. Additionally, vehicle movements will be limited to the transportation of construction materials.

287. Minor impacts will be avoided through detailed construction planning by the contractor and providing clear instructions to the contractor in Environmental Code of Practice (ECP) implementation. Continuous monitoring will be conducted to ensure the contractor's adherence to the ECP guidelines. The following recommendations are designed to prevent significant impacts on the project:
- (i) Provide an induction for contractors to ensure they are fully informed of national EHS requirements, and the requirements outlined ADB SPS (2009).
 - (ii) Ensure that contractor personnel are fully aware of the ECP and their related responsibilities and maintain at least Karakalpak language copies of the ECP on-site.
 - (iii) Make certain that contractors understand that any deviation from or non-compliance with the provisions of the ECP will be considered a compliance failure and will result in corrective action.
 - (iv) Facilitate early acquisition of statutory clearances and ensure that their conditions and provisions are incorporated into the subproject design.
 - (v) Require contractors to strictly implement the project's mitigation measures and comply with health and safety requirements.
 - (vi) Ensure that contractors employ qualified and professionally certified EHS personnel, to be responsible for (a) environmental monitoring, documentation, reporting and (b) preparing and implementing any necessary corrective actions.

12. APPENDICES

Appendix 1. Rapid Environmental Assessment Checklist

Rapid Environmental Assessment Checklist (REA) is prepared for Sub-Project WU-CW-10 “SCADA” using the REA template for *urban development*.

SCREENING QUESTIONS	Yes	No	Remarks
A. Project Siting Is the project area...			
Densely populated?		√	The site is inside the fenced territory of the water utility. The nearest residential building is approximately 210 m to the northeast and 370 m to the south.
Heavy with development activities?		√	No development activities inside the water utility territory.
Adjacent to or within any environmentally sensitive areas?			
• Cultural heritage site		√	The closest cemetery is about 2.1 km southeast.
• Protected Area		√	
• Wetland		√	
• Mangrove		√	
• Estuarine		√	
• Buffer zone of protected area		√	
• Special area for protecting biodiversity		√	
• Bay		√	
B. Potential Environmental Impacts Will the Project cause...			
impacts on the sustainability of associated sanitation and solid waste disposal systems and their interactions with other urban services.		√	The project does not include demolition of any structure; however, it foresees removal of old building materials. All civil work will be inside the existing administrative building. Different construction activities generate various types of solid waste, including domestic and construction waste. This includes excess materials – concrete, sand, crushed stone, discarded material, etc., and domestic waste – recyclables, food waste, paper, plastic containers, and other debris. Waste management during the project implementation will follow Public Health Standard No. 0127-02 0127-

			02 – Sanitary Rules on Stocktaking, Classification, Storage and Disinfection of Industrial Waste (Section 2.1.9), which requires contractual arrangements for the collection, transportation, and disposal of waste by licensed operators. No impact on utility sustainability is anticipated as the project building has access to tap water and a wastewater system.
deterioration of surrounding environmental conditions due to rapid urban population growth, commercial and industrial activity, and increased waste generation to the point that both manmade and natural systems are overloaded and the capacities to manage these systems are overwhelmed?		√	The project activities are not anticipated to impact surrounding environmental conditions, as all foreseen work will be inside the project building.
degradation of land and ecosystems (e.g. loss of wetlands and wild lands, coastal zones, watersheds and forests)?		√	The project building is approximately 276 m from Canal Doslyk, which provides water to Nukus WDU, and has no direct access to the canal.
dislocation or involuntary resettlement of people		√	No dislocation or involuntary resettlement is foreseen as the project building is located within a fenced land plot owned by the water utility.
degradation of cultural property, and loss of cultural heritage and tourism revenues?		√	There are no cultural heritage sites in a one-kilometer area around the site.
occupation of low-lying lands, floodplains and steep hillsides by squatters and low-income groups, and their exposure to increased health hazards and risks due to pollutive industries?		√	The project activities relate to the existing dispatcher station building.
water resource problems (e.g. depletion/degradation of available water supply, deterioration for surface and ground water quality, and pollution of receiving waters)?		√	The project will not cause water resources problems as all the work will be inside the project building.
air pollution due to urban emissions?	√		The project's civil work will impact air quality in the area. However, this impact is local and temporary. For instance, the repair works on walls and flooring cleaning, and applying tile adhesive, roofing materials, paints, and other products used during construction, provide point sources of volatile organic and inorganic compounds and dust. As this will be a temporary phase, no significant impact is expected during construction.

social conflicts between construction workers from other areas and local workers?		√	No social conflicts are expected as the site is a restricted facility with no access for unauthorized individuals. No other construction workers were present on the site during the field mission.
road blocking and temporary flooding due to land excavation during rainy season?		√	No land excavation is foreseen by the project scope.
noise and dust from construction activities?	√		It is anticipated that noise will cause some nuisance to the workers of the water utility during wall cleaning and roofing activities. Site workers will also be exposed to varying levels of noise depending on their specific roles and activities. As this will be a temporary phase, no significant impact is expected.
traffic disturbances due to construction material transport and waste?		√	The site is located along the two-lane paved Nukus-Chimbay highway, which experiences light traffic. The transportation of construction materials and waste is expected to have no significant impact on traffic.
temporary silt runoff due to construction?		√	The project scope does not foresee any earthwork, which could result in silt runoff due to construction.
hazards to public health due to ambient, household and occupational pollution, thermal inversion, and smog formation?		√	The scope of work includes standard building repairs that pose no health risks to individuals. However, the contractor's staff must wear personal protective equipment to ensure occupational health and safety.
water depletion and/or degradation?		√	The project's scope includes standard building repairs.
overpaying of ground water, leading to land subsidence, lowered ground water table, and salinization?		√	The project's scope includes standard building repairs.
contamination of surface and ground waters due to improper waste disposal?		√	The site is more than 3 km southeast of Lake Ashshikul.
pollution of receiving waters resulting in amenity losses, fisheries and marine resource depletion, and health problems?		√	The project building is approximately 276 m from Canal Doslyk, providing water to Nukus WDU, and has no direct access to the canal.

Appendix 2. Project Work Scope

Subproject	Project Component	Scope of Work
WU-CW-01 Water Supply Improvement in Amudarya District	RU-1 WDU	- Water reservoir, 4300m³ -2 units - Pumping station - Electrolysis facility - Checkpoint - Laboratory - On-site utility infrastructure - Security system - Sanitary facilities - Landscaping
	Kuyuk-Kupir WDU	- Water reservoir, 1400m³ -2 units - Pumping station - Electrolysis facility - Checkpoint - Sanitary facilities - On-site utility infrastructure - Backup power supply system (diesel generator) - Fencing - Security system - Landscaping
	Kilichboy WDU	- Water reservoir, 1700m³ -2 units - Pumping station - Electrolysis facility - Checkpoint - Sanitary facilities - On-site utility infrastructure - Backup power supply system (diesel generator) - Fencing - Security system - Landscaping
	Administrative Building with Workshops	- Administrative building - Lab and operations control point - Maintenance and mechanical workshop - Material warehouse with a shed - Garage - Entrance checkpoint - Sanitary facilities - On-site utility infrastructure - Landscaping
WU-CW-02 Water Supply Improvement in Beruni District	Pumping Station NRC-17	- Water reservoir, 500m³ -2 units - Pumping station - Electrolysis facility - Checkpoint - Sanitary facilities - On-site utility infrastructure - Backup power supply system (diesel generator) - Fencing - Security system - Landscaping
	Pumping Station NRC-15	- Water reservoir, 700m³ -2 units - Pumping station - Electrolysis facility - Checkpoint - Sanitary facilities - On-site utility infrastructure - Backup power supply system (diesel generator)

Subproject	Project Component	Scope of Work
		- Fencing - Security system - Landscaping
	Beruni WTP	- Construction of six water wells - Installation of six new pumps - Construction of housing for new wells - Rehabilitation of existing nine wells - Construction of an access road to the new wells - Cleaning the canal supplying water from Amudarya River to WTP
	Bodombosh WDU	- Water reservoir, 300m³ -2 units - Pumping station combined with electrolysis facility - Transformer station - Checkpoint - Sanitary facilities - On-site utility infrastructure - Backup power supply system (diesel generator) - Fencing - Security system - Landscaping
	Chlorination Station #1	- Chlorination station building - Transformer station - Backup power supply system (diesel generator) - Storage building - Checkpoint - Sanitary facilities - On-site utility infrastructure - Fencing - Security system - Landscaping
	Chlorination Station #2	- Chlorination station building - Transformer station - Backup power supply system (diesel generator) - Storage building - Checkpoint - Sanitary facilities - On-site utility infrastructure - Fencing - Security system - Landscaping
	Administration Building with Warehouses	- Administrative building - Lab and operations control point - Maintenance and mechanical workshop - Material warehouse with a shed - Garage - Entrance checkpoint - Sanitary facilities - On-site utility infrastructure - Landscaping
WU-CW-03 Water Supply Improvement in Nukus District	Nukus WDU	- Rehabilitation of the pumping station - Installation of two pumps Q=500m³/h; H=60m; P=97.23kW - Installation of power supply control cabinet - Demolition of pump foundation and old pumps - Construction of new onsite utility infrastructure
	Madaniyat WDU	- Water reservoir, 200m³ -2 units - Pumping station - Electrolysis facility - Checkpoint - Sanitary facilities - On-site utility infrastructure

Subproject	Project Component	Scope of Work
		- Transformer station - Fencing - Security system - Landscaping
	Abadan WDU	- Water reservoir, 100m³ -2 units - Pumping station - Electrolysis facility - Checkpoint - Sanitary facilities - On-site utility infrastructure - Diesel generator - Fencing - Security system - Landscaping
	Kerder WDU	- Water reservoir, 200m³ -2 units - Pumping station - Electrolysis facility - Checkpoint - Sanitary facilities - On-site utility infrastructure - Transformer station - Fencing - Security system - Landscaping
	Administration Building with Warehouses	- Administrative building - Lab and operations control point - Maintenance and mechanical workshop - Material warehouse with a shed - Garage - Entrance checkpoint - Sanitary facilities - On-site utility infrastructure - Landscaping
WU-CW-04 Water Supply Improvement in Karauzyak District	Samat WDU	- Water reservoir, 350m³ -2 units - Pumping station - Electrolysis facility - Checkpoint - Sanitary facilities - On-site utility infrastructure - Diesel generator - Fencing - Security system - Landscaping
	VS-1 WDU	- Water reservoir, 200m³ -2 units - Pumping station - Electrolysis facility - Checkpoint - Sanitary facilities - On-site utility infrastructure - Diesel generator - Fencing - Security system - Landscaping
	Karauzyak WDU	- Water reservoir, 1700m³ -2 units - Pumping station - Electrolysis facility - Checkpoint - Sanitary facilities - On-site utility infrastructure

Subproject	Project Component	Scope of Work
		▪ Diesel generator ▪ Fencing ▪ Security system ▪ Landscaping
	Administration Building with Warehouses	▪ Administrative building ▪ Lab and operations control point ▪ Maintenance and mechanical workshop ▪ Material warehouse with a shed ▪ Garage ▪ Entrance checkpoint ▪ Sanitary facilities ▪ On-site utility infrastructure ▪ Landscaping
WU-CW-04 Water Supply Improvement in Karauzyak District	Oltinkul WTP	▪ 1st and 2nd lift pumping stations ▪ Filtration facilities ▪ Water reservoir, 1700m³ -2 units ▪ Pumping station ▪ Electrolysis facility ▪ Checkpoint ▪ Sanitary facilities ▪ On-site utility infrastructure ▪ Diesel generator ▪ Fencing ▪ Security system ▪ Landscaping
WU-CW-05 Water Supply Improvement in Kungrad District	Kungrad WDU	▪ Pumping station with electrolysis facility ▪ Sanitary facilities ▪ On-site utility infrastructure ▪ Security system ▪ Landscaping
	Usturt WDU	▪ Water reservoir, 200m³ -2 units ▪ Pumping station ▪ Electrolysis facility ▪ Checkpoint ▪ Sanitary facilities ▪ On-site utility infrastructure ▪ Diesel generator ▪ Fencing ▪ Security system ▪ Landscaping
	Akhunbabaev WDU	▪ Water reservoir, 600m³ -2 units ▪ Pumping station ▪ Electrolysis facility ▪ Checkpoint ▪ Sanitary facilities ▪ On-site utility infrastructure ▪ Transformer station ▪ Diesel generator ▪ Fencing ▪ Security system ▪ Landscaping
	Chlorination Station	▪ Chlorination station building ▪ Transformer station ▪ Backup power supply system (diesel generator) ▪ Storage building ▪ Checkpoint ▪ Sanitary facilities ▪ On-site utility infrastructure ▪ Fencing

Subproject	Project Component	Scope of Work
		- Security system - Landscaping
	Administrative Building with Workshops	- Administrative building - Lab and operations control point - Maintenance and mechanical workshop - Material warehouse with a shed - Garage - Entrance checkpoint - Sanitary facilities - On-site utility infrastructure - Landscaping
WU-CW-05 Water Supply Improvement in Muynak District	Uchsay WDU	- Water reservoir, 100m³ -2 units - Pumping station - Electrolysis facility - Checkpoint - Sanitary facilities - On-site utility infrastructure - Transformer station - Diesel generator - Fencing - Security system - Landscaping
	Muynak WDU	- Administrative building - Water reservoir, 1400m³ -2 units - Rehabilitation of the pumping station - Electrolysis facility - Checkpoint - Sanitary facilities - On-site utility infrastructure - Transformer station - Diesel generator - Fencing - Security system - Landscaping
	Tik-Uzyak WDU	- Water reservoir, 200m³ -2 units - Rehabilitation of the pumping station - Rehabilitation of the chlorination facility - Diesel generator - Landscaping
	Shagirlyk WDU	- Water reservoir, 400m³ -2 units - Pumping station - Electrolysis facility - Checkpoint - Sanitary facilities - On-site utility infrastructure - Transformer station - Diesel generator - Fencing - Security system - Landscaping
	Dustlik WDU	- Water reservoir, 300m³ -2 units - Pumping station - Electrolysis facility - Checkpoint - Sanitary facilities - On-site utility infrastructure - Transformer station - Diesel generator - Fencing

Subproject	Project Component	Scope of Work
		▪ Security system ▪ Landscaping
WU-CW-07	Mangit WTP	▪ Pump station of the 1st lift ▪ Water pipeline from the 1st lift to the reaction chamber ▪ Reaction chamber ▪ Pump station ▪ Sedimentation basin ▪ Horizontal settlers ▪ Water filter station ▪ Reservoir for washing filters combined with a pump station ▪ Chemicals section ▪ Transformer substation ▪ Process lines ▪ Clean water reservoir ▪ Pump station of the 2nd lift ▪ Electrolysis facility ▪ On-site power supply networks, external power supply. Security lighting systems ▪ Entrance checkpoint ▪ Operators facility ▪ Maintenance and operations building: laboratory, operations control facility, mechanical maintenance workshops, warehouse with a shed, and garage
WU-CW-08	Rehabilitation of Tuyamuyun PS	▪ Rehabilitation of the pumping station for auxiliary needs ▪ Rehabilitation of the pumping station of the 2nd lift ▪ Rehabilitation of Chlorination facilities
WU-CW-09	Extension of Takhiatash WTP	▪ Water filter station with cap. 60 thousand m3 /day ▪ Electrolysis room with cap. 7,5 kg/hour ▪ Chemicals section
WU-CW-10	NRW Equipment and OCS	▪ Rehabilitation of premises ▪ NRW Equipment and OCS

Appendix 4. Site's Existing Condition

(a) Exterior of Building, Field Mission in December 2024:



(b) Interior Walls Condition, Field Mission in December 2024:



(c) Flooring Condition, Field Mission in December 2024:



(d) Ceiling Condition, Field Mission in December 2024:



Appendix 5. Excerpt of Cadaster Documents



O'ZBEKISTON RESPUBLIKASI IQTISODIYOT VA MOLIIYA VAZIRLIGI HUZURIDAGI KADASTR AGENTLIGI

Davlat kadastrlari palatasi Qoraqalpog'iston Respublikasi boshqarmasi

Nukus filiali

Chop etilgan sana: «14.12.2024» №:1735401/R-A1159975

NOTURAR JOY TOIFASIDAGI KO'CHMAS MULK OBYEKTINING KADASTR PASPORTI

(kadastr yig'ma jildidan ko'chirma)

Kadastr yig'ma jildi shakllantirilgan sana	28.01.2022	
Kadastr pasporti berilgan	Sana	28/01/2022
	Raqami	YK-1735401/1159975

I. Manzil haqida ma'lumotlar

Obyektning kadastr raqami	23:17:01.01:01:0191
Obyekt joylashgan manzil	Nukus shaxri "Kutli koni" MFY Ermazar alakoz kuchasi №295

II. Yer uchastkasi tavsifi

Yer maydoni, (m ²)	Huquqiy hujjatga asosan	38000.00
	Amalda	38000.00
	O'zhashimcha egallangan	0.00
Foydalanish maqsadi	Hujjat bo'yicha	Karakalpak "SUU" tamiynati "Juu" apkershiligi shakllengen jamiet
	Amalda	Karakalpak "SUU" tamiynati "Juu" apkershiligi shakllengen jamiet
Yer uchastkasi bahosi	0 cym	
Servitut	Yuk	

III. Bino-inshoat tavsifi

Mazkur hujjat Vazirlar Mahkamasining 2020-yil 2-sentabrdagi 535-son qarori bilan tasdiqlangan Ko'chmas mulk obyektlariga kadastr pasportini berish bo'yicha davlat xizmatlari ko'rsatishning ma'muriy reglamentiga muvofiq shakllantirilgan ko'chirmaning elektron nusxasi hisoblanadi. Elektron hujjatning nusxasida ko'rsatilgan ma'lumotlar to'g'riligini tekshirish uchun kadastr.uz portaliga o'ting yoki mobil telefon yordamida QR-kodni skaner qiling. Diqqat! Davlat reyestridan elektron shaklda berilgan, shuningdek, qog'azda berilgan ko'chirmalar teng yuridik kuchga ega. Davlat organlariga Davlat reyestridan shakllantirilgan elektron hujjatlarning nusxalarini qabul qilishni rad etishlari qat'yan taqiqlangan.



Appendix 6. Environmental Code of Practice

The Environmental Code of Practices (ECP) has been developed for anticipated minor impacts and small-scale civil works associated with the repair of the Central Dispatcher Station building, as part of Subproject #WU-CW-10: NRW Equipment and OCS. In accordance with the ADB Safeguard Policy Statement (SPS), this subproject is classified as Category C.

The ECP ensures adherence to the national regulatory framework and ADB SPS (2009). It provides guidance for planning and implementing mitigation measures that the contractor will follow during civil work.

The ECP will be included in the bidding and contract documents for Subproject #WU-CW-10. The contractor will be informed of this obligation and will bear the cost of ECP by implementing the necessary measures which are included in the overall construction cost. The ECP will be made available to the project personnel in Karakalpak and Uzbek.

The ECP outlines standard practices and procedures for managing potential impacts on the local environment through the following sections:

- ECP 1: Waste Management
- ECP 2: Fuels and Chemicals Management
- ECP 3: Air Quality Management
- ECP 4: Water Resource Management
- ECP 5: Road Transport and Road Traffic Management
- ECP 6: Construction Camp Management
- ECP 7: Worker Health and Safety.

Table 21: Environmental Code of Practice for Subproject #WU-CW-10

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
ECP 1: Waste Management		
General waste	Health hazards and environmental impacts result from improper waste management practices and excess materials at construction sites.	The Contractor will: • Develop a waste management plan for various specific waste types (e.g., reusable waste, flammable waste, construction debris, food waste) before commencing physical work and submit it to PCU/PMC for approval. • Minimize the production of waste materials through the 3R approach (reduce, reuse, and recycle). • Segregate and reuse or recycle waste, wherever practical. • Prohibit burning solid waste. • Organize the collection, storage, and disposal of waste generated during civil work in an environmentally acceptable manner. • Secure a contract with a solid waste management operator to transport waste to the approved waste management disposal site. • Cover vehicles transporting solid waste with tarps or nets to prevent waste from spilling along the route. • Provide reuse containers for the storage and collection of solid waste at each worksite.

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		• Maintain the sites in a clean, tidy, and safe condition, and provide adequate facilities for the temporary storage of all waste before transportation and final disposal. • Train all involved personnel in waste management practices and procedures, emphasizing good housekeeping practices. • Establish a recording system for all types of waste, including tracking the amounts generated.
Hazardous waste	Health hazards and environmental impacts due to improper hazardous waste management practices	The contractor will: • Collect, handle, store, and transport all hazardous and construction waste in accordance with applicable regulations. • Collect and store hazardous waste in specially designed, appropriately labeled, and sealed containers. • Store all hazardous waste in banded areas and at a minimum distance of 100 m from watercourses. • Arrange for the safe transport off-site of all hazardous waste for reuse, recycling, treatment, or disposal at storage sites by a licensed hazardous waste management operator. • Make available material safety data sheets for hazardous materials on-site during physical work.
	Waste electrical and electronic equipment can contain hazardous substances. These substances can pose risks to human health and the environment due to the presence of heavy metals and flame retardants	Mitigation measures will include prevention, reuse, recycling, and responsible disposal: • Prevention: the water utility, PCU, and contractor will ensure procurement of electrical and electronic equipment with longer lifespans and consider their end-of-life disposal by making it easier to disassemble and recycle. • Reuse: the water utility will repair electronic devices and upgrade their components, such as hard drives or memory, to extend their lifespan; another option will be donation or resale to give used electronics a second life. • Recycling and Responsible Disposal: In Uzbekistan, waste electrical and electronic equipment is treated and disposed of only by licensed organizations according to Articles 40 and 41 of Decree of the Cabinet of Ministers of Uzbekistan #787.⁶¹ The procedure of waste electronic equipment provision for disposal by legal entities like the water utility is stipulated in Decree of the Cabinet of Ministers of Uzbekistan #425.⁶² The procedure of waste lighting equipment disposal of is specified in Decree of the Cabinet of Ministers of Uzbekistan #266.⁶³ Hazardous and non-hazardous waste provided for disposal will be properly recorded by the water utility.
ECP 2: Fuels and Chemicals Management		
Fuels and chemicals management	Construction materials used in physical work can potentially cause contamination. Improper storage and handling of fuels, lubricants, chemicals, and hazardous materials on-	The contractor will: • Prepare fuel and chemicals management plan and submit it to PCU/PMC for approval. • Train relevant contractor personnel in fuel handling and spill control procedures.

⁶¹ Decree of the Cabinet of Ministers of Uzbekistan #787, dd. 02.10.2018, Improvement of Solid Waste Management

⁶² Decree of the Cabinet of Ministers of Uzbekistan #425, dd. 06.06.2018, Improvement of Order for Managing Scrap and Waste of Non-ferrous and Ferrous Metals

⁶³ Decree of the Cabinet of Ministers of Uzbekistan #266, dd. 21.09.2011, Approval of Regulation on Collection and Disposal of Waste Mercury-Containing Lamps

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	site, as well as potential spills from these substances, may harm the environment or the health of workers.	• Store chemicals in banded areas on top of sealed plastic sheets and at a minimum distance of 100 meters from watercourses. • Ensure that all refueling operations on working sites use absorbent pads and/or straws to minimize spills, which will be put in place before commencing refueling operations. • Reduce risks of groundwater and surface water pollution and immediately remove any existing pollution. • Remove, store, and treat any contaminated soil and absorbents as hazardous waste following the hazardous waste section above. • Cease work and inform responsible personnel in the event of spills, with work only recommended after the elimination of pollution risks. • Implement refueling operations only with the correct equipment (i.e., nozzles of the appropriate size) and only with suitably trained and experienced refueling operators. • Provide personal protective equipment for appropriate personnel, including clothing, safety boots, helmets, masks, gloves, and goggles.
ECP 3: Air Quality Management		
Vehicles transporting construction materials	Ambient air quality can be affected by vehicle exhaust emissions and the combustion of fuels.	The contractor will: • Utilize vehicles and other construction equipment, such as diesel generators, in compliance with applicable national legislation regarding emissions and perform regular maintenance on machinery and equipment. • Utilize vehicles, plants, and equipment to meet Euro 4 standards. • Maintain the vehicles in good working condition according to the specifications defined by their manufacturers to maximize combustion efficiency and minimize contaminant emissions.
Installation of HVAC and other appliances and technologies	Buildings are a significant source of GHG emissions due to the energy used for heating, cooling, and lighting. Renovations can worsen this situation if they don't enhance energy efficiency, resulting in higher energy demands and, consequently, increased emissions. Indoor air quality may suffer due to off gassing from new materials, such as furniture, paints, and flooring.	The mitigation strategies will include: • Implementing energy-efficient lighting, appliances, and heating/cooling systems by contractor to reduce energy consumption and GHG emissions. • Installation of solar panels for power supply by contractor. • Using low-VOC paints, flooring, and other building materials by contractor to minimize indoor air pollution. • Ensuring adequate ventilation in all rooms of the building to remove pollutants from new materials and excess moisture by the water utility. • Maintaining HVAC systems, cleaning air ducts, and promptly addressing any moisture issues to prevent mold and mildew growth by the water utility after building commissioning by the contractor.
Civil work, including application of tile adhesive, painting, removing wall plastering and old	Dust generation from physical work sites, material stockpiles, and application of tile adhesive, paints, and other products used	The contractor will: • Equip all workers with personal protective equipment (PPE) to prevent dust from impacting on their health.

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roofing material, and flooring cleaning	during construction provide point sources of volatile organic compounds and other irritating chemicals that can impact the environment and human health.	- Cover loose and fine materials (e.g., sand and fine aggregates) when being transported on trucks and stored piled at the site. - Water dry, exposed surfaces and stockpiles of aggregates. - Store hazardous materials with potential gas emissions in sealed containers and use them in well-ventilated, secure, and low-risk areas. - Seal cement and other fine materials after using or store them in containers with lids; concrete batching plants should be located away from sensitive receptors.
Civil work, including drilling, using jackhammers, and other equipment when removing old plastering, outer wall decoration, flooring, and roofing materials	Noise and vibration may have an impact on people and property.	The contractor will: - Employ the best available work practices on-site to minimize occupational noise levels. - Maintain all equipment in good working order following manufacturer maintenance procedures. - Use low-noise equipment and machinery. - Install temporary noise control barriers where appropriate. - Notify affected individuals if major noisy activities are undertaken, such as unloading or drilling. - Provide all its workers with an effective PPE, such as earmuffs and earplugs. - Monitor noise and vibration and adjust physical work as required. - Plan activities on site and deliveries to and from the site to minimize noise impact. - The contractor will take several measures to minimize vibrations from the equipment. These measures include (i) using anti-vibration mounts to isolate the vibrating equipment and reduce the transmission of vibrations to surrounding structures, (ii) employing damping materials to absorb and dissipate vibrations, (iii) installing vibration barriers to block the passage of vibrations, and (iv) modifying construction techniques to generate less vibration, such as using quieter methods for demolition or piling.
ECP 4: Water Resource Management		
Siltation and infiltration of chemicals and fuel into the soil and groundwater	Runoff from stockpiled materials and chemical contamination from fuels and lubricants can lead to silt-laden runoff during rainfall, which may cause siltation and infiltration into the soil and groundwater	The contractor will: - Follow the management guidelines and mitigation measures outlined in ECP 1 and ECP 2. - Minimize the generation of sediment, oil and grease, excess nutrients, organic matter, litter, debris, and any form of waste (including petroleum and chemical waste). - Meet drinking water needs with tap, bottled, and tankered water, where tap and tankered water will be boiled before consumption. - For civil work, water will be delivered to the site using a special water truck, which will also be used to water the area for dust suppression.
Discharge from the works site	During civil work, both surface and groundwater quality may deteriorate due to wastewater discharged from the site and camp.	The contractor will: - Stockpile materials away from drainage lines. - Prevent all solid and liquid waste (oils, chemicals, bitumen spray waste, and wastewater from brick, concrete, and asphalt cutting) from entering waterways by ensuring environmentally compliant collection, storage, transportation,

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		treatment, and disposal to an approved waste disposal site or recycling depot. Wash out ready-mix concrete agitators and concrete handling equipment at off-site washing facilities or approved, bunded on-site washing facilities. Ensure that the tires of construction vehicles are cleaned in the washing bay at the entrance of the construction site to remove mud from the wheels.
ECP 5: Road Transport and Road Traffic Management		
Construction vehicular traffic	Increased road traffic due to vehicles transporting construction materials will affect the flow of regular road traffic and compromise the safety of road users.	The contractor will: - Prepare and submit a traffic management plan to PCU/PMC for approval. - Ensure that the traffic management plan results in uninterrupted traffic movements during civil work. - Provide signs at strategic locations on the roads in compliance with applicable traffic and road regulations and coordinate their placement with the Karakalpak Republican Road and Transport Authority. - Install and maintain a display board at each important road intersection on the roads to be used during the delivery of oversized loads, clearly showing the following information: location/street, delivery date of the oversized load, suggested detour route map, and name and contact details of the contractor. - Restrict truck deliveries to daytime working hours. - Operate road traffic and transport vehicles during non-peak periods to minimize traffic disruptions. - Enforce on-site speed limit.
Construction vehicular traffic	Accidents and spillage of fuels and chemicals.	The contractor will: - Restrict the transport of oversize loads. - Operate road traffic and transport vehicles, if possible, during non-peak periods to minimize traffic disruptions. - Design and implement safety measures and an emergency plan to contain damages from accidental spills. - Designate special routes for transporting hazardous materials, as necessary.
ECP 6: Construction Camp Management		
Siting and location of the camp	Construction camps, while providing necessary housing for workers, can have both positive and negative impacts on the surrounding environment and local communities, including economic benefits, social interactions, and potential environmental issues.	The contractor will: - Prepare, submit, and secure PCU/PMC approval of a construction camp management plan 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, solid waste storage locations, and drainage facilities, before the camp development. - Locate the construction camps in areas that are acceptable from an environmental, cultural, and social perspective. - Consider locating construction camps away from communities to avoid social conflict over the use of natural resources and utility services or to avoid the possible adverse impacts of the construction camps on the surrounding communities.

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		• Ensure that local authorities are informed of the camp's set-up to maintain effective surveillance over public health, social, and security matters.
Construction camp facilities	A lack of proper infrastructure facilities, such as housing, water supply, and sanitation, will increase pressure on services, leading to substandard living conditions and health hazards.	The contractor will provide: • Adequate housing for all workers. • A safe and reliable water supply from reasonable water sources that meet applicable national standards. • Hygienic sanitary facilities and a sewerage system, with treatment facilities. • Separate latrines and bathing facilities for males and females. • Stormwater drainage facilities.
Disposal of waste	Effective waste management is crucial for minimizing health and environmental impacts.	The contractor will: • Comply with the management and mitigation measures stipulated in ECP 1 and ECP 2. • Ensure proper collection, handling, storage, and disposal of solid waste within the construction camps. • Establish waste collection, transportation, and disposal systems with the necessary human resources, equipment, and vehicles. • Ensure that all solid waste will be collected and removed from the camps and disposed of in approved waste management and disposal facilities.
Health and Hygiene	Risk of the spread of communicable diseases to nearby communities and place a burden on local healthcare systems.	The contractor will: • Provide adequate health care facilities within construction sites. • Provide 24-hour first aid facilities, maintain medicine stocks, and appoint a full-time designated nurse. • Provide ambulance facilities for laborers during emergencies. • Ensure regular medical check-ups for all workers to prevent the spread of disease. • Provide workers with safe water for drinking and food preparation from reliable sources. • Train workers in basic sanitation, healthcare, and safety practices, as well as the specific hazards associated with their work. • Provide HIV awareness programming, including STI (sexually transmitted infections) and HIV information, education, and communication for all workers regularly. • Provide adequate drainage facilities throughout the camps to ensure that disease vectors such as stagnant water bodies and puddles do not form. • Deliver training sessions on best hygiene practices for all workers and provide them with relevant handouts.
Safety	Inadequate safety facilities in camps may create security problems and fire hazards.	The contractor will: • Provide appropriate security personnel (police/home guard or private security guards) and enclosures to prevent unauthorized entry into camp areas. • Maintain a register to keep track of the headcount of people present in the camp at any given time. • Use flameproof materials for the construction of labor housing and site offices, ensuring that this housing is of sound construction and capable of withstanding high winds and storms.

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		- Equip the camp and office sites with the appropriate types of firefighting equipment. - Display emergency contact numbers clearly and prominently in strategic locations throughout the camps. - Communicate the roles and responsibilities of laborers in the event of emergencies.
Site restoration	Restoring the construction camps to their original condition requires the demolition of the existing camps.	The contractor will: - Ensure that camp demolition is designed and implemented in following relevant regulations. - Dismantle and remove all facilities established within the construction camp, including the perimeter fence and lockable gates, upon completion of the civil work. - Dismantle the camp in phases as the work decreases, rather than waiting for all activities to be completed. - Provide prior notice to the laborers before demolishing their camps or units. - Maintain the noise levels within the prescribed standards during demolition activities. - Hire specific contractors as necessary to demolish various structures, promoting the recycling or reuse of demolished materials. - Reuse demolition debris to the maximum extent possible and dispose of debris at designated waste disposal sites. - Restore sites to their original condition or another condition as formally agreed with landowners.
ECP 7: Worker Health and Safety		
Best Practices	Construction activities may pose potential health and safety risks to the construction workers and site visitors, leading to severe injuries and deaths. The workers and, to a lesser extent, the local community will be exposed to some risks, including (a) exposure to physical hazards from working on heights, use of heavy equipment, including cranes, trip and fall hazards, (b) exposure to dust, noise, and vibrations, (c) falling objects, (d) exposure to hazardous materials, and (e) exposure to electrical hazards from the use of tools and machinery.	The contractor will: - Implement suitable occupational health and safety standards for all workers and site visitors, which will not be less than those laid down on the national standards, e.g., the ILO Code of Practice on Safety and Health in Construction and IFC's EHS Guidelines on Occupational Health and Safety and IFC EHS Guidelines on Construction and Decommissioning and the contractor's guidelines in addition to complying with the national standards. - Provide workers with a safe and healthy work environment, taking into account the inherent risks of specific civil works activities and the particular classes of hazards present in the work areas. - Provide workers with the necessary PPE, including safety boots, helmets, masks, gloves, protective clothing, goggles, full-face shields, and ear protection, and ensure that this PPE is properly maintained. - Implement safety procedures, including providing information, training, and protective clothing to workers involved in hazardous operations. - Appoint a health and safety officer to oversee the health and safety of workers. - Inform the local authorities responsible for health and security in a timely manner before the commencement of civil works and the establishment of construction camps to maintain effective surveillance over public health, social, and security matters. - Ensure a Grievance Redress Mechanism (GRM) is in place and operational.

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		- While working at heights, the contractor will: - provide adequate training on equipment use, emergency procedures, and safety protocols - use well-maintained ladders, scaffolding, and PPE like harnesses and helmets - use balconies or parapets with railings as safe working platforms - employ fall protection systems like guardrails, floor coverings, fall restraint systems (harnesses and lanyards), and fall arrest systems (safety lines) - ensure unprotected edges are guarded to prevent accidental falls - ensure competent supervisors are on-site to monitor compliance and address safety concerns. The water utility will ensure pregnant women are aware of potential physical problems like eye strain and back pain that can arise from prolonged screen time. The working conditions of such women will be adjusted following Article 142 of the Labor Code of Uzbekistan.
Accidents	The lack of first aid and healthcare facilities in the immediate vicinity will exacerbate the health conditions of people injured in accidents.	The contractor will: - Provide appropriately equipped first-aid stations and healthcare facilities that are easily accessible throughout the workplace and at camps. - Document and report occupational accidents, diseases, and incidents, and maintain statistics to evaluate trends and take preventative action where needed. - Prevent accidents, injury, and diseases arising from, associated with, or occurring in the course of work by minimizing, so far as reasonably practicable, the causes of hazards in a manner consistent with good international industry practice. - Identify potential hazards to workers, particularly those that may be life-threatening, and provide necessary preventive and protective measures. - Provide awareness training to contractors' drivers to ensure they strictly follow driving rules. - Provide adequate lighting in physical works areas, along access routes, in camps, and along access roads (as needed).
Construction Camp	A lack of proper infrastructure facilities, such as housing, water supply, and sanitation, will increase pressure on local services and result in substandard living standards and poor health.	The contractor will provide: - Adequate ventilation facilities. - Safe and reliable water supply. - Hygienic sanitary facilities and sewerage systems. - Stormwater drainage facilities. - Safe storage facilities for petroleum and other chemicals. - Solid waste collection and disposal systems. - Training. - Security fences. - First aid facilities.
Water and sanitation facilities at the work sites	Lack of water and sanitation facilities at physical works sites	The contractor will provide: Drinking water facilities.

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	inconveniences workers and affects their hygiene.	• Portable toilets at the work sites should be cleaned daily and their sewage removed for proper disposal.
Training	A lack of awareness and basic knowledge of healthcare among the construction workforce makes them susceptible to potential diseases.	The contractor will: • Train all construction workers in general health and safety matters, as well as the specific hazards associated with their work, including basic hazard awareness, site-specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural hazards, as applicable. • Train all construction workers in basic sanitation and health care issues, e.g., how to avoid malaria and transmission of sexually transmitted infections (STI) HIV/AIDS. • Provide an awareness campaign supervised by PCU for local communities to increase project-specific and general safety awareness amongst the local communities, as appropriate.

STI = sexually transmitted infections; HIV/AIDS = Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome; PCU = Project Coordination Unit; PMC = Project Management Consultant; GRM = Grievance Redress Mechanism; PPE = personal protective equipment; IFS's EHS Guidelines = International Financial Corporation's Environmental Health and Safety Guidelines; ECP = Environmental Code of Practice