**DEPARTMENT OF DRINKING WATER SUPPLY AND WASTEWATER DISPOSAL**

**The Climate Resilience Water Services Project**

**TERMS OF REFERENCE**

**No IDA-CRWSP-IC-2**

**International Wastewater Process Engineer**

**Bishkek 2023**

**Department of Drinking Water Supply and Wastewater Disposal under the State Agency for Architecture, Construction, Housing and Communal Services under the Cabinet of Ministers of the Kyrgyz Republic**

**TERMS OF REFERENCE**

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| **Title of position:** | **International Wastewater Process Engineer** |
| **Name of the project:** | **Climate Resilient Water Services Project** |
| **Direct Supervisor:** | **PIU Director** |
| Duty Station | Bishkek, Kyrgyz Republic |

**1. Introduction**

The **Climate Resilient Water Services Project (CREWSP)** (the “Project”) was approved in April 2022 followed by its effectiveness in October 2022. It will be implemented in Batken, Jalal-Abad, Osh, and Issyk-Kul regions of the Kyrgyz Republic. The Project is funded by the International Development Association (the “Association” or the “Bank”) and is consistent with the Financing Agreement (the “FA”), Project Appraisal Document (PAD) and other procedures and regulations of the Association. Implementation of the Project is guided by the Project Operational Manual (POM).

**The Project Development Objective (PDO) is to:**

1. increase access to climate-resilient water services in selected river basins; and
2. strengthen institutional capacities for climate-resilient water management at the local and national levels.

Water services include water supply and sanitation (WSS) as well as irrigation and drainage (I&D) services. The Project will improve the coverage and quality of WSS and I&D services in selected basins. At national level the Project will increase institutional capacities for climate-resilient water management.

The Project consists of four components:

Component 1. Infrastructure Investments and Service Improvements.

Component 1.1. Water supply and sanitation infrastructure.

This sub-component covers investments in increasing the resilience of drinking water and sanitation services, as well as increasing wastewater treatment capacity. The subcomponent finances civil and electrical/mechanical water production facilities (wells, water intakes, as well as disinfection and pumping of energy efficient/renewable energy sources as needed), water transmission and distribution works to households in the project areas, along with wastewater management infrastructure, wastewater collection, transportation, treatment and waste disposal. The project will also support the reconstruction of WASH facilities in selected schools, kindergartens, rural health centers/hospitals in the project areas to make them suitable for women and disability inclusive.

Component 1.2. Irrigation and drainage services improvement.

This sub-component covers the modernization of three existing I&D schemes (Kara-Unkur in Jalal-Abad, Shakhimardan in Batken, and Kurshab-Sai in Osh) located in the 28,000 ha KSA basin. At the infrastructure asset level, project financing, rehabilitation and modernization of two irrigation headworks and irrigation canals (234 km) and associated structures. These activities support adaptation to drought risks by improving transport efficiency and water use control through modern facilities, and to flood and mudflow risks through improved bypasses and structure protection.

Component 2. Institutional Strengthening for Climate Resilient Service Delivery, Water Resources Management and Dam Management.

Component 2.1. Institutional strengthening for water supply and sanitation service delivery.

This subcomponent will support the government's sector development strategy and roadmap reform and build on previous analytical and advisory services. Support reforms in the water supply and sanitation sector will focus on financing expert advisory services and technical assistance in priority areas of reform and institutional strengthening. Technical assistance includes consideration of climate change variability and related impacts, strengthening institutional capacity to identify and design sustainable water supply and sanitation systems, and mainstreaming gender and social dimensions into the national program. A more effective institutional and regulatory framework will improve water sector governance, operational efficiency and sustainability, thereby improving the delivery (in terms of coverage and quality) of water services. This in turn will reduce the risk of water scarcity/drought, improve water quality, and increase overall sustainability.

Component 2.2. Institutional strengthening for irrigation water services delivery.

This subcomponent will support (i) data integration of surface water intakes for the sector within DWIS; (ii) use of remote sensing for irrigation water management and water accounting and their integration into DWIS; (iii) expansion of DWIS data visualization functions; and (iv) support of water user associations, including training, asset management, operating budget disclosure and climate-optimized agriculture.

Component 2.3. Water and soil quality monitoring system.

It includes two main activities. First, the improvement/establishment of biochemical laboratories at the central level in Bishkek and in the three oblasts of the KSA basin (Osh, Jalal-Abad and Batken) and capacity building of relevant specialists in the State Environmental Laboratory at DEM. This activity funds the renovation of existing laboratory buildings, provision of equipment, support for laboratory accreditation, and IT system upgrades at KSA. Second, this subcomponent funds institutional strengthening of the DEM to (i) improve staff skills in chemical methods for monitoring surface water and soil quality, including data collection and analysis, and (ii) develop a nationwide water and soil quality monitoring plan

Component 2.4. Dam management.

This subcomponent is funding services and equipment to (i) establish a dam management unit within the WRS tasked with overseeing dam management nationwide; (ii) guide the development of dam management plans; (iii) develop dam management plans for four dams located in the KSA basin (Papan, Naiman, Tortgul, and Bazar-Korgon); and (iv) develop a dam information module within the DWIS, including implementation of remote monitoring tools such as drone applications and remote sensing.

Component 3. Project Management, Monitoring and Evaluation (M&E) and Professional Development.

This component will fund the necessary staff, consultant services, professional development, and operational costs to enable the project teams to fulfill their implementation responsibilities.

Component 4. Contingent Emergency Response Component.

Immediate response to a crisis or emergency, as needed.

**2. Objective of the Assignment**

The objective of the assignment is to provide technical assistance to the PIU in the development of wastewater treatment plants for settlements located in the Issyk-Kul region, including wastewater data analysis, selection of technology, and advisory support during design and procurement of works, construction and commissioning of treatment facilities. Assist in the preparation of bidding documentation for the procurement of a Contractor for the construction of a new WWTP for the villages of Bokonbaevo, Kadzhi-Sai and Kyzyl-Suu located in the Issyk-Kul region and assist the PIU throughout the entire tender evaluation and contract award process.

The **International Wastewater Process Engineer** will report to the PIU Director and will work closely with the PIU Infrastructure Engineer and other relevant PIU specialists.

**3. Scope of Services:**

The tasks of the **International Wastewater Process Engineer** include:

1. Review the existing previously prepared design and estimate documents for water supply and sewerage for three villages - Bokonbaevo, Kadzhi-Sai and Kyzyl-Suu.
2. Review of proposed sites for wastewater treatment facilities for compliance with the legislation of the Kyrgyz Republic (SanPin, SNiP, SPZ, Environmental and other standards) with the issuance of recommendations to the PIU.
3. Assess the composition of wastewater and soil (near existing drains) based on laboratory research.
4. Advise the PIU on the most suitable wastewater treatment technology/process, taking into account the effluent quality, treatment needs for the specific environment and the applicable legislation.
5. Assess the sewerage networks coverage to inform decision making by PIU and provide the required reviews and advisory support during the design and construction phase
6. Preparation of a preliminary advisory notes with the recommended treatment solution for each of the study of the area, analysis of existing documents and data;
7. Assist PIU in determining the procurement method and preparing bidding documents;
8. Assist PIU in procuring of consulting services contracts, equipment contracts, and civil works contracts in accordance with WB procurement guidelines and time frames, in accordance with the approved project implementation schedule;
9. Assist in the evaluation of contract bids to determine capitalized cost in terms of equipment replacement and operation and maintenance costs;
10. Providing assistance in the bidding process, providing clarifications at the request of bidders, evaluating proposals and preparing a report;
11. Assistance in pre-bid meeting and contract negotiations;
12. Assist with contract award and contractor mobilization.
13. Timely assistance to PIU in quality assurance of PIU-accepted final detailed design (DD);
14. Assist PIU in preparing detailed cost estimates and Price Schedules (in case of Design and Build);
15. Provide guidance to construction managers on best procedures for oversight and reporting;
16. Evaluate the efficiency and durability of equipment proposed for inclusion in the wastewater treatment facility;
17. Assist in evaluating the impact of sewerage operating expenses (OPEX) on the sewer tariff structure;
18. Provide necessary assistance during on-the-job training and seminars conducted by the contractor and suppliers, as well as during testing and maintenance activities;
19. Review O&M manuals regarding plant operation and maintenance supplied by contractors and suppliers and provide comments or inputs required for maintenance plans and their application; Advising the PIU on delivery of the certificate of completion;
20. Coordinate and review orders for additional work; Advising the PIU on issuing final acceptance certificates and issuing warranty obligations;
21. Assist in the selection of the Technical Supervision Consultant;
22. Ensure day-to-day monitoring of the contract performance of the WWTP contractors;
23. Review operation and maintenance manuals regarding the operation and maintenance of installations supplied by contractors and suppliers, and provide comments or input required for maintenance plans, as well as their application;
24. Assist during commissioning tests and thereafter during the damage liability period and make relevant comments to the PIU
25. Assist PIU in administration and execution of all contracts for the construction of WWTPs under the project;
26. Provide training to PIU staff in the areas of project management, water supply and sewerage system construction, construction supervision, contract administration and enforcement, and reporting.
27. Perform other duties necessary for the successful implementation of the Wastewater Treatment Contract;
28. Consulting the PIU on issuing certificates of final acceptance and issuance of warranty obligations;
29. Conduct operational testing and commissioning of works, issue certificates of practical completion and acceptance of works at the end of the defective period.

**4. Deliverables**

*As a result of engaging an International Wastewater Process Engineer, the following results shall be achieved:*

**Phase 1: Preparation and Research:**

1.1 Prepare a preliminary technical report based on site survey, analysis of existing documents and data.

1.2 Determination of the most appropriate wastewater treatment technology, taking into account site specifics and treatment quality requirements.

1.3 Determination of the sewerage network coverage area, including development of schemes and projects for sewerage network extension.

**Phase 2: Development of bidding documents:**

2.1 Assist in development of a package of bidding documents based on the preliminary technical report, including technical specifications, requirements for contractors and cost estimates (price schedules).

2.2 Assessment of expected costs (OPEX/CAPEX) for construction and operation of the WWTP.

**Phase 3: Recommendations and Administration:**

3.1 Propose solutions to improve the efficiency and environmental sustainability of wastewater treatment.

3.2 Assist in selecting technical solutions that will contribute to the future sustainability and development of the vodokanal (water ulitility).

**Phase 4: Support and monitoring:**

4.1 Participate in planning and monitoring of the project implementation process, including control over compliance with deadlines and budget.

4.2 Ensure transfer of knowledge and experience to the client and local specialists for more efficient operation and maintenance of the WWTP.

4.3 Maintain updated and quality documentation for subsequent phases of the project and future developments in wastewater treatment.

Reports:

1. Preliminary technical report and analysis of the area.
2. Report on selection of wastewater treatment technology.
3. Assessment of economic feasibility.
4. Recommendations for improving efficiency and sustainability.
5. Report on planning and monitoring of the project implementation process.
6. Documentation for transfer of knowledge and experience to the client.
7. Updated documentation for subsequent phases of the project.

Table 1- Payment Schedule

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| **Stages** | **Deliverables** | **Payment percentage** |
| **Phase 1: Preparation and Research:** | 1.1 Prepare a preliminary technical report based on site survey, analysis of existing documents and data. | 10% |
| 1.2 Determination of the most appropriate wastewater treatment technology, taking into account site specifics and treatment quality requirements. | 10% |
| 1.3 Determination of the sewerage network coverage area, including development of schemes and projects for sewerage network extension. | 10% |
|  | 2.1 Assist in development of a package of bidding documents based on the preliminary technical report, including technical specifications, requirements for contractors and cost estimates (price schedules). | 10% |
| 2.2 Assessment of expected costs (OPEX/CAPEX) for construction and operation of the WWTP. | 10% |
| **Phase 3: Recommendations and Administration:** | 3.1 Propose solutions to improve the efficiency and environmental sustainability of wastewater treatment. | 15% |
| 3.2 Assist in selecting technical solutions that will contribute to the future sustainability and development of the vodokanal (water ulitility). | 15% |
| **Phase 4: Support and monitoring:** | 4.1 Participate in planning and monitoring of the project implementation process, including control over compliance with deadlines and budget. | 5% |
| 4.2 Ensure transfer of knowledge and experience to the client and local specialists for more efficient operation and maintenance of the WWTP. | 5% |
| 4.3 Maintain updated and quality documentation for subsequent phases of the project and future developments in wastewater treatment. | 10% |

**5. Institutional Arrangements**

The International Wastewater Process Engineer reports to the Director of the PIU. All reporting materials shall be submitted in English and Russian in one hard copy and one electronic copy. All prepared materials shall be approved by the PIU Engineer by the PIU Director.

**6. Timing**

The lump sum contract will be signed for a period before the end of 2028. The consultant's tasks will be performed on a periodic basis, with a probationary period of six months. The contract may be extended beyond the initial term subject to satisfactory performance of the International Wastewater Process Engineer and based on mutual agreement of the parties to the contract.

**7. Qualification Requirements**

* Master's/Doctoral degree in wastewater engineering/water supply and sanitation or hydraulic engineering;
* At least 15 years of experience in construction of water supply, sewerage, wastewater treatment systems, and other related infrastructure facilities;
* At least 10 years of experience in process design and calculations of wastewater treatment plants.
* Experience in preparation of at least 3 technical reports in the field of wastewater treatment facilities financed by international agencies (WB, ADB, EU, USAID, UNDP and other international bilateral donor organizations);
* Experience in capacity building (trainings, on-the-job training), technical and contract management trainings to the Executing/Implementing Agencies;
* At least 5 years of experience in wastewater treatment plants
* Experience in implementing similar projects, preferably funded by international agencies (WB, ADB, EU, USAID, UNDP and other international bilateral donor organizations);
* At least 3 years’ experience in the Central Asian region preferably.
* Confirmed good understanding, practical knowledge and experience of FIDIC contract terms and conditions.